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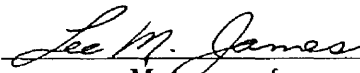
Private Forest Land Ownership and Management in
31 Counties of the Northern Portion of the Lower
Peninsula of Michigan

presented by

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PRIVATE FORESTLAND OWNERSHIP AND MANAGEMENT IN
THIRTY-ONE COUNTIES OF THE NORTHERN PORTION
OF THE LOWER PENINSULA OF MICHIGAN

By

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A THESIS

Submitted to the School of Advanced Graduate Studies of
Michigan State University of Agriculture and Applied
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DOCTOR OF PHILOSOPHY

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ABSTRACT

It was found that, for purposes of studying private forestland ownership and management in a thirty-one-county area of the northern portion of the Lower Peninsula of Michigan, owners could be grouped into eleven general classes based primarily on their occupations. Individual owners within each of these eleven classes were found to form a relatively homogeneous class with respect to their attitudes toward forestland and their actual management of the forest. However, all private owners combined were found to be a very heterogeneous group when analyzed by the same criteria.

Farmers were found to constitute the largest single private owner class in the thirty-one-county study area. They held about one-fifth of the 4.9 million acres of privately owned commercial forestland in that portion of the state. Business-professional men, recreational groups, and wage earners ranked in that order after farmers. Each of these classes held over one-half million acres of commercial forest. Farmers ranked highest in terms of timber volume, and also had the largest portion of large-sized timber. However, in terms of the ratio of softwood to hardwood timber volume, recreation groups and forest industries ranked highest.

Less than three-tenths of the forest area was owned by residents, while nearly four-tenths of the forest was owned by persons residing more than 100 miles from their property.

About three-fourths of the forestland was acquired by purchase. Some three-tenths of the forest had been held by present owners over twenty-five years.

Outside of farm use (31 percent) most of the forest was held for recreational purposes. Speculation ranked as the third most important objective of management, and accounted for about one-fifth of the forest area.

Almost one-half of the forestland was owned by persons who had never harvested timber from their land. Among those owners who had harvested some timber poor control was exercised over actual cutting operations. About one-half of the area on which timber had been harvested recently showed poor forestry practices had been followed. Most owners who admitted they practiced poor forest management stated that it was due to their "inability to supervise because of physical limitations or demands of a more remunerative activity."

Several proposed and actual public policy measures designed to offer incentives to private owners to practice good forestry had

little appeal. This included the Michigan forest yield tax laws which have been in effect for over twenty-five years. It also included such proposed schemes as low-cost forest credit and forest management cooperatives. On the other hand, proposed long-term forest management contracts appeared to have good chances to succeed. Forest benefit payments apparently had been rather effective.

Among all of the public service assistance and educational programs directed toward helping private forest owners, forestry extension appeared the most effective. The farm forestry work of the state conservation commission, on the other hand, seemed to be the least effective of the assistance programs examined.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Every appraisal of the forestry situation in the United States over the last fifty years has pointed out that the satisfaction of America's future timber needs will depend increasingly upon the decisions of a heterogeneous group of private forestland owners. This problem was evident at the inception of this study early in 1953 when opinion was based largely upon the findings of the United States Forest Service's Reappraisal Report of 1946. At the time these words are being written professional foresters, resource economists, and other persons interested in the health of our forest economy have had their eyes opened anew by the Timber Resource Review.¹

In the continental United States there are some 484 million acres of commercial or productive timberland, of which 358 million

¹ Edward C. Crafts, U.S. Forest Service. A summary of the Timber resource review. Chapter I, Timber resource review (preliminary review draft), 127 pp. Sept. 1955.

acres are privately owned and distributed among 4.5 million different owners.¹ This situation, however, is not geographically uniform, varying from a low of about 11 percent of the forest area privately owned in some states up to 99 percent in others. The situation in Michigan is not drastically different from the national average with 18.8 million acres of commercial forest, two-thirds of which is privately owned and divided among more than 174 thousand owners.²

At the time this is being written demographers are predicting that by 1975 the population of the United States will reach 212 million; by the year 2,000, 275 million. Assuming these population increases, a proportionately greater working force, and greater productivity per worker, economists have estimated a gross national product of 586 billion dollars by 1975, and 838 to 866 billion dollars by the year 2000, in terms of constant dollars. Using these basic assumptions the Stanford Research Institute³ has estimated a continually high consumption of forest products despite probable

¹Ibid., p. 103.

²George F. Burks, U.S. Forest Service. A summary of basic statistics. Chapter IX, Timber Resource Review (Preliminary, review draft), Sept. 1955, p. 7.

³Stanford Research Institute. America's demand for wood 1929-1975. Tacoma, Washington, Weyerhaeuser Timber Co., June 1954, 404 pp.

price increases which are expected as we are forced to rely on a less economical forest resource.

Relying in part on this work, the United States Forest Service¹ foresees that such demands for forest products can only be reflected in increased pressure upon our forestlands. Due to increased pressure on our total land resources for other uses, it is felt that total forest area can not be increased. The only ways in which forest production can be sustained or increased is to intensify forest management and halt destructive cutting on private lands, inasmuch as the sustained yield capacity of our publicly owned forests can be increased very little. How to bring about this needed increase in productivity of private forestlands is certainly destined to be the greatest challenge forestry must face in the next fifty years.

Other statistics, brought to light by the continuous national forest survey by the United States Forest Service and presented in such reports as those already mentioned, have shown how our private forestland is divided according to size of ownership; whether it is part of a farm ownership, wood-using industry ownership, or other private ownership; and to some extent how these subdivisions

¹Edward C. Crafts, U.S. Forest Service. Op. cit., p. 124.

are handled. These facts are all interesting and give a good description of the forest resource situation on a national, regional, or state basis, and are sufficiently detailed when related to broad geographical classes to isolate broad problem areas. As already indicated, the results of the forest survey show that most of the forest productive capacity is privately owned (Table 1), belonging to many individual owners. Further, these data show that the bulk of these private lands are poorly managed and that the forest resources thereon are badly deteriorated. They also indicate that large private properties are generally better handled than small private ones. All of these are problems associated with our institution of private ownership of land.

Before remedial measures can be suggested for the private sector of the forest economy more must be learned about it, and since the problem varies geographically this information needs to be accumulated for different economic areas. As previously stated, these private forest owners, particularly the small individual owners, are a very heterogeneous group. They vary in occupational pursuit, educational attainment, income level, purpose of ownership, understanding of forestry, age, place of residence with reference to their timber, and location of their forest holdings with respect to timber markets; all of which are only a few of the ways owners may differ

.

TABLE 1

LAND AND FOREST ECONOMY OF MICHIGAN, THE LAKE
STATES, AND THE UNITED STATES, COMPARED^a
BY MAJOR ITEM^a

Item	Mich- igan	Lake States	United States
(thousand acres)			
Land area by major classes:			
Total land area	36,494	122,711	1,903,824
Total forest	19,322	55,201	647,686
Commercial	18,849	53,272	484,340
Noncommercial	473	1,929	163,346
Cropland in farms	9,061	40,680	411,148
Pasture and range	3,084	11,881	693,246
Other	5,027	14,949	151,744
Commercial forestland by stand size class:			
Total commercial forest	18,849	53,272	484,340
Sawtimber stands	2,556	6,457	178,616
Pole timber stands	5,411	16,010	169,408
Seedling & sapling stands	7,668	20,370	94,709
Nonstocked stands	3,214	10,435	41,607
Commercial forestland in private ownership	12,462	31,833	358,250
(million cubic feet)			
Net timber volume growing stock in private ownership	7,169	16,025	303,666
Net annual timber growth on all lands	433	1,180	14,211
(thousand cubic feet)			
Timber harvest from live growing stock on all commercial forestlands	215,510	537,170	10,744,401

^aGeorge F. Burks. Op. cit., 116 pp.

individually. Each factor of this type in combination with others of a similar nature affects the way individual forest owners handle their forest resource under a given set of circumstances. Also, they govern in various degree how forest owners will react to corrective measures instituted through public action such as educational programs, benefit payments, forest credit, and many others.

These are the situations one finds at the national and state levels which make private ownership of forestland a problem. Most of these problems stem from our institution of private ownership of land and our complex economic and social structure which profoundly affect all of the variables that bear upon this relationship of man to land.

The people of Michigan as of 1950 were realizing income payments to individuals from the forest sector of the economy of more than one hundred million dollars per year.¹ This income was 3.7 percent of the state's total income, and exceeded that from agriculture, not including manufactures based on agricultural products. Not all of this income, which includes that from manufacturing forest products and raw timber values, is attributable to Michigan's forest

¹ Lee M. James and James G. Yoho. Income from timber products in the United States. Journal of Forestry. Feb. 1953, p. 87.

resource. However, there is little doubt but what the income the people of Michigan receive from the forest economy could be increased in the long run both in actual dollars and relative to other segments of the economy. Such a possibility seems to hinge directly upon increasing the productivity of Michigan's privately owned forestlands.

Quoting again from the Timber Resources Review,¹ the problem is well summarized by the following statement:

Unquestionably, the heart of the forest problem of the United States lies with the 3.4 million farm owners and the miscellaneous group of 1.1 million "other" private ownerships. Although they own mainly very small tracts of forest land, and their principal interests usually are not timber growing, in the aggregate they control well over half of the Nation's commercial timberland and they must continue to supply a substantial portion of the raw materials for forest industry.

Historical Background

Private property in land. Basic to this study and the problem previously outlined is the concept of private property in land. To most persons our institution of private property in land is so commonplace that it is taken for granted. It is difficult to realize that it could be otherwise, yet, in many ways its nearly universal

¹ Edward C. Crafts. Op. cit., p. 128.

acceptance in the settlement of North America is almost a historical accident. Certainly if the development of this private ownership institution in western Europe at about the time of settlement on this continent had gone in a different direction our problems today might be entirely different.

One should remember that the institution of private ownership in land as we know it in the United States today evolved gradually over centuries. It is certainly not something so sacred that it is to be ever revered and never altered in the slightest degree by deliberate action of rational men. Changes have been, in fact, made from time to time resulting in such a gradual alteration that they have been almost impossible to perceive.

As the feudal system declined in Europe the services performed by tenants or serfs were converted into money rents, or else paid "lump sums" to extinguish the services entirely. Gradually free proprietorship emerged as the rights of the cultivator became more intense and those of the landlords less so.¹ This transition was more rapid in some countries than others. There were even some attempts to establish the feudal system in the early

¹Richard T. Ely and George S. Wehrwein. Land economics. New York, The Macmillan Company, 1940, p. 85.

settlements in North America, particularly in the French settlements. Most of this was swept away by the Revolutionary War, and legally by the legislatures of the several states shortly thereafter. The Ordinance of 1787 abolished the last traces of feudal influence in newly acquired federal land. Property in land tended to become like almost any other property in the freedom of its transfer and in inheritance.¹ This was the system that came to prevail on all lands which became a part of the public domain of the United States, and this included virtually all of continental United States aside from the thirteen original colonies.

Public land disposal policy. Partly because the new government needed revenue and partly because it became a part of our basic national philosophy to develop a nation of freeholders, alienation of the public domain as rapidly as possible became federal policy, and state policy when the states were fortunate enough to acquire title to sizable acreages. Our basic philosophy was that private property would create a nation of freeholders whose self-interest would give us maximum production, automatically conserve our national resources, and, with each owner "under his own vine

¹Ibid., p. 88.

and fig tree," guarantee a certain equality in the distribution of wealth.¹ Under this policy and guided by such a philosophy our federal government disposed of by sale, homesteading, gift, or subsidization 1,029 million acres in the 150 years following the Revolutionary War. Virtually all of the land area of Michigan, excepting 23 thousand acres of Indian lands, was disposed of by the federal government in this fashion to private owners or to the state.

Land disposal was one of the biggest jobs of our federal government for a long period, and the whole program seemed to have been prompted by the greatest of urgency, but not always with the greatest of expediency. Often, at the local land office level, the program was poorly administered. Individuals often resorted to the most fraudulent of means to gain control of lands being disposed of in this way.

Generally the procedure was to offer areas for sale or homesteading, when the latter procedure finally became legal, just about as quickly as the areas could be surveyed. As early as 1814 a federal land office was established in Detroit. Sales were started at once, and the tempo developed rapidly.

¹Ibid., p. 90.

Public land disposal in Michigan. In 1837 Michigan became a state, but large acreages of federal public-domain land still remained within her borders. Actually, considerably more public-domain land was alienated after Michigan became a state than had been disposed of before. Virtually all of the very early land sales were made to people for agricultural purposes, and most of it went for the minimum price of \$1.25 per acre. Likewise, most of the federal land disposed of in the first years of statehood was in small parcels, and evidently for agricultural purposes. It should be remembered, however, that until the passage of the Homestead Act of 1862 there was no restriction on the amount that an individual could purchase other than his ability to pay.

Michigan seems to have fared better than most states in gaining control of federal lands which were later sold by the state. Considerable acreage fell into state control as a result of the Swamp Land Grants. Under this act public-domain swamplands within the states were granted to the states. Michigan so acquired some six million acres during the 1850's.¹

Under the Ordinance of 1785, which provided for the reservation of every sixteenth section of each township for the support

¹Harold Titus. The land nobody wanted. Michigan Agricultural Experiment Station, Special Bulletin 332, April, 1945, p. 4.

of common schools, the state of Michigan acquired title to over a million acres. Had Michigan not become a state prior to 1848 this amount would have been doubled. Grants for higher education added close to another three hundred thousand acres to state ownership. About four million additional acres were deeded to the state¹ for internal improvements such as canals, roads, and railways. A portion of this later acreage was given directly to private builders by the state as subsidies; some was sold to raise money for improvements.

The state disposed of the twelve million acres acquired by these means just as fast as it could and with no regard for intended usage or size of purchase. This policy proved to be very convenient for the accumulation of large private holdings and the ensuing timber exploitation.

Federal land disposal continued in Michigan during the latter half of the nineteenth century almost in competition with state disposal. During this period restrictions of one type or another limited the size of individual federal alienations. Also, restrictions prevailed, in some cases, as to residence and development of the land. This offered somewhat of a legal restriction to land

¹ Loc. cit.

concentration by timber operators. It did not, however, offer much practical restraint. Fraudulent homesteading, for example, was a favorite way in which timber companies gained control over a quarter- or half-section here and there in the finest timber. Once such scattered properties were acquired, little respect for ownership lines was observed when logging actually began.

Timber exploitation and land speculation. The period 1850 to 1890 was all that was needed to remove nearly every stick of pine worth harvesting from the upper half of Michigan's Lower Peninsula. Almost as fast as the timber was cut the land was disposed of, either by sale or tax delinquency. Thus most of the land either became the property of a hopeful settler or the state. Land so reverting to the state, or state land from which the timber had been stolen, was usually easily marketed to land speculators. This type of timber-denuded land was thought to have a better agricultural potential than it had originally, and hence land speculators did a flourishing business.

The land also had another value which contributed to speculation. The early pine logging had scarcely touched the birch and maple forests which had continued to increase in value up to the depression of 1893. The timber scavenger provided a ready market

for land which, in many cases, the state land commissioner was selling for the second time. It was during this era that the terms "timber skinner" and "rubber 40" were developed to describe the fellow, usually a former logger, who bought a tract here and there so that he might help himself to the adjoining timber. This practice along with fire put the finishing touches on the timber-depletion job, and back to the state again went the land.

From that point on the land had little appeal for its timber value, but promotion and speculation continued. Some of the cut-over land was purchased by hopeful farmers even though by the turn of the century the fate of much of the land for that purpose had become clear. This is not meant to imply that agriculture had failed everywhere in the pine country. Bona fide homesteaders who had carefully selected their land after on-the-ground inspection ferreted out the islands of better land and were fairly successful. On lands less suited to conventional farming, ranching was attempted rather extensively, and seems to have been modestly successful in some localities. Large individual tracts were sold by the state for this purpose.

At about the turn of the century, land speculators found a new market for Michigan's oft-sold acres in the form of the non-resident recreationist. There appears to have been little overoptimism

concerning the land's immediate value for this purpose, but this market developed gradually and rather consistently, except for depression years, down to the present. Since World War II it has undoubtedly been the most salable land value in northern Michigan.

Sustained-yield forestry is mentioned. By the time forest destruction had reached a point at which little hope could be held for the natural regeneration of the most valuable species, there was strong talk about sustained-yield forestry as the answer to Michigan's land problem. The Report of the Commission of Tax Inquiry¹ mentions the possibility of private sustained-yield forestry, and cites the interest of the Dupont Powder Company as evidence. Virtually nothing materialized, however, in the way of deliberate private forestry.

Concern over forestry did result in the establishment of the State Forestry Commission in 1902, which in 1921 became part of the state conservation department along with other agencies concerned with land, game, forests, and other natural resources. Actual management of state lands for forest production became a part

¹ Commission of Inquiry, Tax Lands and Forestry. Report of commission of inquiry, tax lands and forestry to the Governor and Legislature of the State of Michigan. Wynkoop Hallenbeck Crawford Co., State Printers, Lansing, 1908, p. 73.

of their program along with the acquisition of tax-delinquent lands and lands considered submarginal for other uses. Later the Federal Forest Service engaged in a similar forestry effort in the state. Detailed consideration of public forestland is beyond the scope of this study, and its mention is made here primarily for two reasons: First, these programs provided a means of absorbing the surplus from a glutted land market even through depression periods. Second, they have provided demonstrations of forestry in action. These programs as continued over the years have resulted in a present area of 3.8 million acres of commercial forestland in state ownership and 2.3 million acres in national forests in Michigan.¹

Public programs and private forest owners. The problem of unstable land ownership of forestlands, or lands in the process of reverting to forestry, continued to vex the Michigan people for most of the first half of this century. Inquiry after inquiry, and study after study was made, some of which are mentioned in Chapter II. These resulted in special public programs of many types to aid private forest owners. Several of these are discussed in the chapters on taxation (Chapter VII) and education, special services, and

¹George F. Burks. Op. cit., p. 5.

the forest owner (Chapters IX and X). It is possible to mention only briefly here some of the work not covered elsewhere.

In 1938 the Land Use Planning Program of the United States Department of Agriculture, in cooperation with the Agricultural Extension Service of Michigan State College, was embarked upon. This program, operating through local committees, made recommendations for sound land use based upon soil surveys of the state. These local committees suggested proper land use to private owners and served as a sounding board for the state conservation department's land acquisition and disposal policy at the local level. This work seems to have contributed a great deal toward a sane and more stabilized ownership and land-use pattern, particularly with respect to the attitudes of local people.

County rural zoning was legalized by the state of Michigan in 1935, and a similar law legalizing township zoning became law in 1943. The law provides that the county boards of supervisors may by ordinance establish zoning districts in which the use of land for agriculture, forestry, recreation, residence, and other uses may be encouraged, regulated, or prohibited. Potentially this law offers a system whereby the local people of Michigan can regulate forestland use as has been done quite frequently in Wisconsin. However, as

of 1950 only two counties within the study area had enacted zoning ordinances, and townships had been even less active.

Purpose of the Study

The purposes or objectives of this study can be stated simply, as to explore the most important relationships between private ownership of forestland and the condition and management of the forest resource. Essentially, it is a study of forestland tenure; i.e., the holding or use of any or all of the "bundle of rights"¹ in private forest property. Because of the extremely heterogeneous character of the group of individuals collectively called forestland owners on one hand, and the variable landed resource called the forest on the other hand, these relationships are exceedingly complex. To attempt to discover cause-and-effect relationships between a few of these which might have applicability to any extensive forested area would be a gigantic task. It would be further complicated by the nature of the forest resource, which is slow to react to changes in treatment. In other words, the need for practicability in research limits the objectives of this type of study.

¹V. Webster Johnson and Raleigh Barlowe. Land problems and policies. New York, McGraw-Hill Book Company, 1954, p. 251.

Stated in a more realistic way, the objectives of the study are to compare forest owners with the forest resource. In detail, the objectives become to:

1. Discover who are the forest owners.
2. Determine how they may be grouped into owner classes.
3. Determine how much forestland is controlled by each of these groups and the condition of the timber thereon.
4. Determine how forest management differs between these groups.
5. Determine how forest management differs within groups with respect to certain measurable variables attributable to individual owners or ownerships. This would include: owner's age, length of tenure, method of land acquisition, distance from property, et cetera.
6. Determine attitudes of owners toward forestland and their influence on forest management.
7. Determine objectives of forest ownership and their relation to forest management.
8. Determine the effectiveness and extent of use of public forestry assistance programs to forest owners, including: taxation, extension, farm foresters, soil conservation service, and benefit payment programs.

9. Appraise the needs for, and possible usage of, suggested forestry assistance programs, including: forest credit, management cooperatives, and private management agreements.
10. Evaluate the results of the study in terms of forest policy implications which could lead to increased timber production locally and nationally.
11. Contribute to the general fund of knowledge in forest economics to explain owner's behavior beyond financial motivation.

Application of Results

The application of the results of this study has been implied in the stated objectives. The major implication is that public policy concerning forestry programs and private forestry ventures alike can be more wisely formulated and more efficiently administered when the answers to these three basic questions are known: (1) Who are the forest owners? (2) How do they react toward their forest property? (3) How can they be expected to react under slightly different conditions? It is the aim of this study to discover the behavior of forest owners with respect to these questions and the ramifications thereof. From that point on it can only be hoped

that the results of this research, like most investigations in the realm of the social sciences, will serve to guide those charged with the responsibility for making policy decisions or taking administrative action in these matters.

Northern Michigan has long been considered a land problem area, and particularly a forestland problem area. Many forest policy measures have been enacted and put into effect in this area to correct the problem. Policy changes have been made from time to time by open-minded legislators when they were demonstrated as necessary. Doubtlessly policy changes and additions to programs will be made in the future. If the results of this study contribute toward a more enlightened type of forest policy, the forest and land economy of northern Michigan should benefit in the long run.

It is also believed that the results of this study will contribute to the general fund of knowledge concerning the behavior of forest owners. Our teachings in forest economics long have been based upon the assumption that the forest owner is an "economic man"; i.e., that his motivations are purely financial. Undoubtedly this is the basic reason for his actions, but it fails to explain everything. Anything that can partially explain why or how these purely economic incentives are tempered will be a contribution to the field. A few studies made in other sectors of the country have

made sizable contributions toward the thinking along such lines, but those results need to be substantiated elsewhere.

The ultimate application of these results may be thought of as contributing to the solution of the forest resource problem in Michigan, and by so doing, aid in the solution of the forest problem of the United States.

Area of Study

This study was confined geographically to the northern portion of the Lower Peninsula of Michigan (Figure I). It was limited to that part of Lower Michigan north of an irregular line running from Bay City to Muskegon. This division was made along county lines, and thus there was delineated an area comprised of thirty-one counties. This is the portion of Lower Michigan frequently referred to as the cut-over area. It is the land where pine reigned as king for many years. It is a section in which gray podzolic soil types built up under coniferous forest cover predominate in sharp contrast with those brown podzolic soils further south which developed under the broadleaf forests.

This area coincides with District 3, Michigan, of the Lake States Forest Survey, part of the continuous national forest survey, and conducted by the Lake States Forest Experiment Station, United

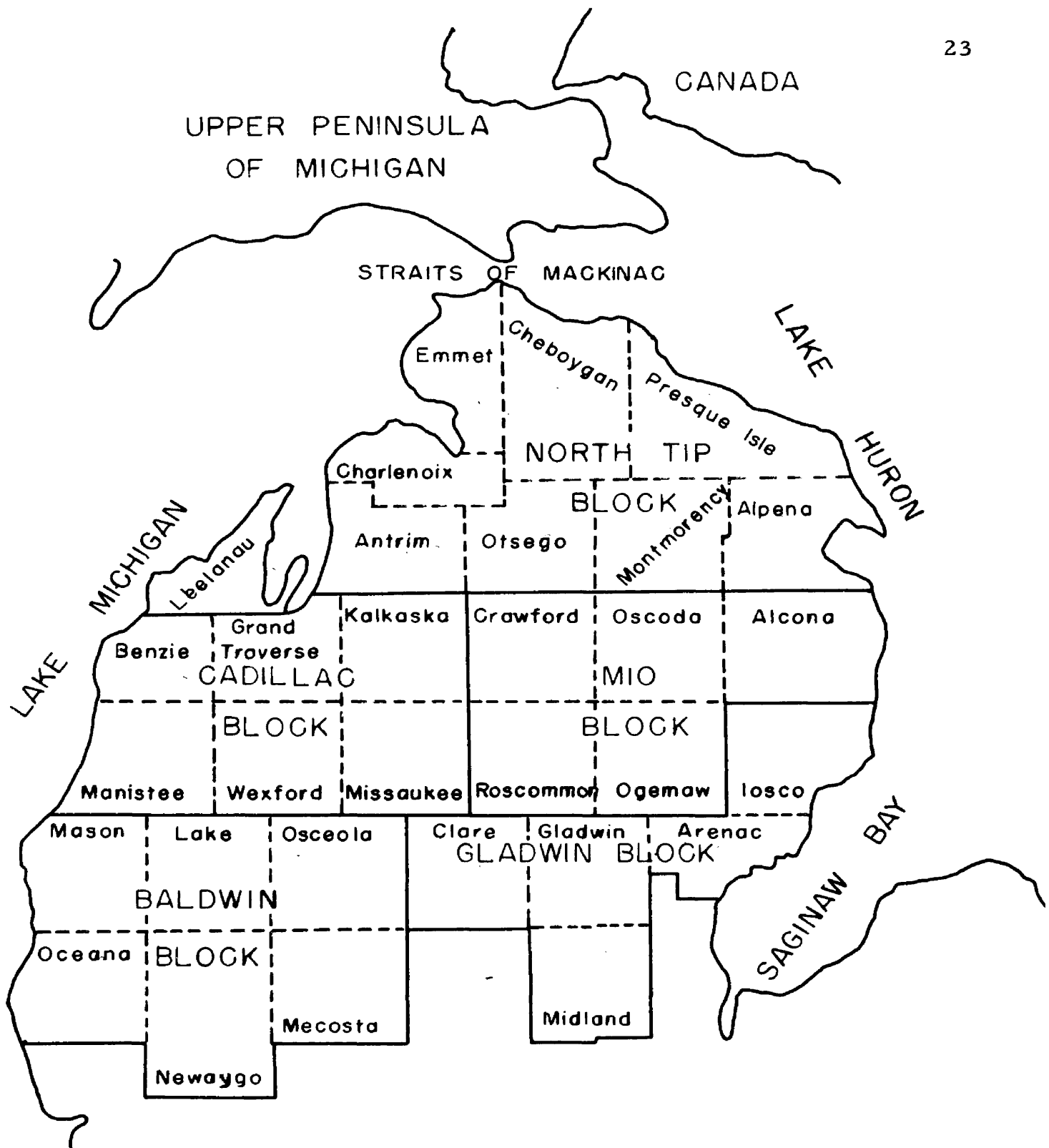


Figure I. Northern portion of the Lower Peninsula of Michigan showing the location of the study area, forest survey blocks and counties.

States Forest Service, St. Paul, Minnesota. This area, for survey purposes, was broken down into five blocks (Figure I) consisting of from five to nine counties each. These blocks were named Cadillac, Baldwin, Gladwin, Mio, and North Tip. The survey work progressed generally from block to block in that order.

These thirty-one counties comprise a total land area of 10.7 million acres with about 7.5 million acres classed as commercial forestland. The total population of the area according to the 1950 census was 394,450 permanent residents. This figure, of course, does not include the nonresident recreationists who greatly swell these numbers in certain seasons of the year.

The socioeconomic pattern is just about as uniform and as much of a contrast to the situation in the southern part of the state as is the case with the physical resources. There are no large cities in the area, and little manufacturing is carried out. Traverse City (population 16,974) is the largest city. Alpena, Cadillac, and Midland are the only other cities with populations over ten thousand.

The tourist and resort business gives the greatest visible evidence of economic activity to the region, and is developing into a year-around business. It is, however, almost wholly dependent upon the natural resources of the region; i.e., lakes and rivers, forestland, and heavy winter snows. Small-scale general farming

and small forest industries such as sawmills are spread over the region. Fruit farming is important in the Grand Traverse Bay area. Heavy industry is prevalent only in a few scattered localities. Limestone quarries in the Alpena-Rogers City locality, the chemical industry at Midland, the paper industry and Manistee, and oil-drilling operations at several widely scattered points constitute the major extent of the large industry group.

The topography of the region as a whole is undulating to almost level. The area has been subjected to repeated glaciations, and most of the topography as well as the soils were of this origin. Soil texture is generally on the light and sandy side with scattered areas of heavy soils in some places. Some of the most important of the forest soil types are the Roselawn, Rubicon, Grayling, Newton, Ottawa, Onaway, and Saugatuck, which occur in the sand and sandy loam phases. Presently these areas are stocked mostly with jack pine, oak, and aspen. The northern hardwoods are generally confined to the heavier soils not named above, while the northern white cedar type along with some tamarack and spruce or balsam fir are confined to the more poorly drained sites. The most prevalent soils are droughty due to their sandy texture. Drainage and stream patterns are poorly developed in most areas.

This thirty-one-county area, though drastically different from southern Michigan, is typical of most of the northern Lake States. This resemblance applies to the economy, the soils and forest cover, the topography, and general appearance of the land. The results of this study should be typical of those one might expect in northern Minnesota or northern Wisconsin. Those areas have all undergone a similar social and economic development, but at slightly different dates. The geological histories of the three states are equally similar.

CHAPTER II

RELATED LITERATURE AND PREVIOUS STUDIES

There exists within the field of forest economics a body of research literature generally recognized as being within the area of forestland ownership. It is intended to review here the most important of these studies as well as some older studies of a related nature conducted in Michigan. Because of the broad nature of this study this chapter had to be restricted to the type of literature just described. Studies having some relation to other areas of work covered in this study are mentioned with the discussion of those particular subjects.

Forestland Ownership in New England¹

Scope and method of the study. This study was confined to twenty-three New England towns (virtually synonymous with township)

¹Solon L. Barraclough. Forest land ownership in New England. Mimeographed Ph.D. thesis, Harvard University, 1949, 269 pp. For a brief summary of this study, see: Solon Barraclough and James C. Rettie. The ownership of small private forest-land holdings in 23 New England towns. U.S. Forest Service, Northeastern Forest Experiment Station, Upper Darby, Pa., Station Paper No. 34, 32 pp., March, 1950.

selected as representative of the private forest ownership situation. Actual work was concentrated on private ownership, although public ownership is discussed at length in the complete text. Persons owning less than ten acres of forestland were completely excluded from the study, while large ownerships of over five thousand acres were in effect rejected by the way selection of the twenty-three towns for the study was made.

The twenty-three towns selected were considered to represent "different forest types, different kinds of farming areas, and different types of rural economy." The author admitted that achievement of representation was difficult in a heterogeneous forest area like New England. In the selection of the towns for study, those with an insignificant forest area were not considered, and likewise those with known large ownerships were excluded.

The author strongly defended the design of the study because it involved no strict probability sampling of the entire universe of two hundred thousand forest owners in New England. In like manner he defended the absence of statistical tests applied to the compiled data. In addition to limited time and funds, the arguments for not using a random-sampling procedure were: lack of a homogeneous universe to sample, that no regional homogeneity existed with respect to measurable variables, that variables affecting ownership could not

be assumed independent and hence not valid for making statistical inference. He considered a judgment sample best suited for the information desired.

In the twenty-three towns selected tax records were examined and a list of owners of more than ten acres of forestland was compiled. In addition, by inquiring of local officials, each owner's name, occupation, age, legal address, property assessment, tax delinquency, forest area owned, and purpose of ownership were determined. Some 2,106 owners holding 278,041 acres were listed.

A mail questionnaire was sent to all of these owners, 31 percent of whom replied. This questionnaire asked length of tenure, method of acquisition, reasons for ownership, the ten-year forest product's harvesting history, and future harvesting expectations.

From the original list of 2,106 owners, a random subsample of 50 was selected for personal interview to substantiate the results of the mail questionnaire and to gain personal contact impressions. In 25 cases the forest holdings were inspected. Also, in the 50 personal interviews, 32 of whom failed to respond to the mail questionnaire, the question of bias in the mail response was considered. No bias was judged present with respect to interest in forestland, but there did seem to be a bias in favor of more literate owners.

Most of the objectives of this study have already been implied. It should be stressed that considerable emphasis in the study was placed on consideration of the variables not purely economic in nature which affect forest owners' actions. No attempt was made, however, to correlate any of the variables observed with the physical forest resource or the silvicultural handling of the resource. This action was justified on the grounds of the large sample required and the advance knowledge that 25 percent of the holdings had no management with which to correlate.

Highlights of the findings. Some 74 percent of the forest area was acquired by purchase, and 22 percent by inheritance. The remainder was obtained by either gift or foreclosure. Gift bequeaths were more common among small holdings, while foreclosures usually involved larger acreages.

In the matter of length of tenure, half of the forest acreage was found to have been held less than twenty years, 13 percent only about three years, but 30 percent over thirty years.

The relative importance of different occupation groups, excluding farmers and forest industries, in this study as well as for several other studies reviewed in this section is summarized in Table 2. Including all owners, owners of wood-using plants owned

24 percent, business or professional people 19 percent, and full-time farmers 12 percent of the forestland, respectively. These three groups together owned over half of the forestland. The average size of holding was largest for public utility groups (1,122 acres), closely followed by wood-using industries (832 acres). Smallest average-sized holding was that of the laborer-clerical group (63 acres). Clubs and institutions had the fourth largest average-sized holding (726 acres).

In respect to length of tenure by occupation group, wood-using industries had held 64 percent of their forestland over thirty years; likewise, 98 percent of the club and institution acreage, 66 percent of the public utility acreage, and 91 percent of the undivided estate acreage was held equally as long. The labor-clerical group of owners were the late-comers in terms of forest acquisition.

In terms of numbers of owners, 32 percent were over sixty years of age. This oldest age group was fairly evenly divided among the occupation groups.

Fewer absentee owners were found than were expected. Some 65 percent of the owners lived in the same town in which their forestland was located, or in the adjacent town. Only 8 percent of the owners resided outside of New England.

The timber values on the land were given as the most important reason for ownership of 62 percent of the forestland. Recreational purpose was the most important reason on 23 percent of the forest area. No other reason accounted for more than 12 percent of the land owned. By occupation groups a similar analysis showed timber values to be most important to wood-using industries and farmers, while recreational purposes were most important to business-professional and retired people. The labor-clerical and housewife groups were spread about equally among all objectives of ownerships.

A harvest of forest products was made by 53 percent of the owners in the ten years prior to the study, while only 44 percent said they expected to make a harvest in the next ten years. More wood-using industries and farmers had made cuts in the preceding ten years than any other occupation group, and the same groups were the most optimistic about the cutting prospects in the next ten years.

Future of Private Forestland Ownership in the Northern Lake States¹

Scope and method of the study. The study area was limited to five counties in northwestern Wisconsin selected so as to represent

¹C. H. Stoddard, Jr. Future of private forest land ownership in the northern Lake States. Journal of Land and Public Utility Economics, 18: 267-283, Aug. 1942.

the region in its basic economic and physical characteristics. It was the first of the ownership studies similar in type to the first four discussed in this chapter; i.e., that it was designed to explore owners' attitudes rather than to postulate ownership trends.

The five counties studied had a forest area of 1,516,329 acres. A list of owners was compiled from the tax records eliminating those with delinquent taxes. Likewise owners with less than thirty-five acres were eliminated. Questionnaires were sent to the remaining 1,008 owners. Some 492 owners representing 219,772 acres returned their questionnaires.

The questionnaire sent was designed to determine: size of ownership, length of tenure, method of acquisition, purpose of ownership, estimate of the best use of the land, attitude toward public assistance, interest in forestry, forest supervision, and plans for cutting. Owners were classified into three broad groups: corporations, individuals, and miscellaneous. The corporation group was further subdivided into operating timber companies, real estate concerns, and others; the individual group was subdivided into local, nonresidents, and undivided estates; and the miscellaneous group was subdivided into recreational clubs and lodges or churches.

Highlights of the findings. Operating timber companies were found to own 25 percent of the forest area, other corporations 20 percent, local individuals 17 percent, and nonresidents 24 percent. All other groups held less than 7 percent, with the miscellaneous group, which included recreation, holding less than 2 percent. It was found that 71 percent of the forestland was acquired by purchase from other private owners, and 5 percent by tax deed or inheritance. It was implied that a large portion of the remaining 24 percent was acquired by purchase from the government.

The analysis by length of tenure indicated 55 percent of the land had been held over fifteen years, about 33 percent of the land had been owned from five to fifteen years, and the remaining 12 percent had been owned less than five years. About three-fourths of the forestland in corporate ownership had been held over fifteen years, while less than 40 percent of the individually owned forest area owned by the miscellaneous groups had been held less than fifteen years.

Almost none of the corporate-owned land (about half of the total) was being held for purposes of developing the timber, and they were holding mostly for resale or timber-liquidation purposes. Some 35 percent of the owners who owned a like proportion of the acreage were holding for resale purposes. Most of the land retained

by individuals was also held for resale purposes, and this was the most important purpose of ownership for both resident and non-resident owners. Nonresident owners ranked recreation as the second most important objective of ownership, while resident owners ranked timber and farm development second. Very few owners had any intention of growing timber crops. The timber that was being grown appeared to be the result of an accident associated with some other objective of ownership which forced the current owner to hold the land long enough to obtain a timber harvest.

Some 61 percent of the land was found to have some form of active management (not necessarily forest management) being practiced upon it. Most of those inactively managed parcels belonged to the nonresident individual or recreationist group. Owners holding 52 percent of the land planned to make a commercial timber cut; those holding 39 percent had no intention of cutting anything. Farmers, local residents, and timber companies held three-fourths of the area planned for cutting.

Interest in forest management assistance through cooperatives ran surprisingly high (22 percent of the owners, 34 percent of the area). Some 24 percent of the owners did not appear to have a concept of management high enough to intelligently answer questions concerning it. Most owners, other than the timber company group,

had little understanding of handling forest properties for maximum income even on a short-run basis.

A very small percentage (less than 3 percent) of the acreage in the study area was registered under the Wisconsin Forest Crop Law, and most of the owners of this land had entered their lands for tax savings purposes only. Many of those not making use of this law indicated that they had avoided it because of the entangling "red tape" involved.

Soil classification maps of the respondents' lands were studied, and on that basis 139 thousand acres were judged fit only for forestry. These same owners thought only 69 thousand acres of their land was suited for such a low-value use as forestry. Other potentialities suggested by the owners indicated they were over-optimistic about other prospective values of their lands.

Ownership and Use of Forestland in Two Subregions of California¹

Scope and method of the study. The study described here is actually a continuous series of studies tied in with the Forest Survey

¹ Adon Poli and H. L. Baker. Ownership and use of forest land in the coast range pine subregion of California. U.S. Forest Service, California. Forest & Range Experiment Station, Berkeley, Technical Paper No. 2, 64 pp., June 1953.

Also: Adon Poli and H. L. Baker. Ownership and use of forest land in the redwood-fir subregion of California. U.S. Forest

of California. Reports are put out as work progresses for individual counties; then periodically a more comprehensive regional report is issued. The methodology of the study and style of report appears to be standardized.

The Forest Survey in California prepared base maps showing areas according to forest type, stand age, density, volume, and site quality. Other base ownership maps showing owners' names and addresses were prepared from those data available from county assessors and tax collectors. The second map was then superimposed or otherwise correlated with the forest map.

Transects were then drawn on the base maps in an east-west direction two miles apart. Ownerships so intercepted became a part of the sample. Each owner's name, address, and the physical information gleaned from the maps were then recorded on a card along with acreage, assessed value, and legal description obtained from the tax records.

All of the private forest ownerships were classified into timber operating company, timber holding company, timber operating

Service, California Forest & Range Experiment Station, Berkeley, Technical Paper No. 7, 76 pp., June 1954.

For methodology, see: A. A. Hasel and Adon Poli. A new approach to forest ownership surveys. Land Economics, 25: 1-10, Feb. 1949.

individual, timber holding individual, range-livestock farming company, range-livestock farming individual, other farmers, recreational owners, and others. Also, all of the ownerships were grouped into ten size-of-ownership classes.

A brief questionnaire was then sent to the sample owners seeking reasons for acquiring the land, future plans for the land, owner's occupation, how the land was acquired, operating tenure arrangement, and present use of the forest. These answers were then entered on the individual owner's card along with physical data on his ownership. No evaluation was attempted of actual management practices.

Number of owners were estimated in a unique fashion by weighting each owner's record card inversely with the probability of his being intercepted by the transect. An owner's probability of interception was determined by the north-south expanse of his ownership.

Compilations were made in terms of total land area as well as forestland area.

Highlights of the findings. The findings pointed out here refer to the coast range pine subregion and the redwood-fir subregion. No distinction will be made between the regions unless the differences

are extremely significant. This is justified because the actual findings of these studies have limited applicability to the Michigan study area, since physical conditions are so drastically different.

Range-livestock farming individuals, timber holding companies, and timber operating companies owned most of the forestland. None of the other ownership classes held as much as 10 percent of the forestland. The timber owner classes controlled most of the old sawtimber, while range-livestock owners, recreationists, and farmers controlled very little. The latter three groups owned most of the nonstocked forestland, while young sawtimber and pole stands were rather evenly distributed. This probably reflected the former land disposal policy of the timber companies. All company properties were, on the average, several times larger than those individually owned.

About 70 percent of the land area was owned by persons or companies who operated their own land, while about 8 percent was leased out to others. Some 21 percent was left idle.

Between 60 and 70 percent of the commercial forest acreage was acquired by purchase, about 10 percent by inheritance, and about 5 percent by homesteading.

Resident owners held only 34 to 57 percent of the forestland area. Nonresident out-of-state owners controlled 70 percent of the

old growth sawtimber area, and county residents controlled less than 30 percent.

Nonfarm ownership by occupation class is summarized in Table 2.

On the basis of numbers of owners, farming and ranching was the leading single purpose of land acquisition, with present land use and proposed land use listed as objectives for nearly 50 percent of the owners. Recreation and residence ranked next to ranching in the same type of classification.

Private Forestland Ownership in Louisiana¹

Scope and method of the study. Inasmuch as the studies by Folweiler and Chamberlin et al. are quite similar in their approach,

¹ A. D. Folweiler. Ownership of forest land in selected parishes in Louisiana and its effect on forest conservation. Unpublished Ph.D. thesis, University of Wisconsin, 1943, 307 pp.

Also, based on the same study: A. D. Folweiler. Forest land ownership in Louisiana and its influence on timber production. Louisiana Agricultural Experiment Station, Baton Rouge, Bulletin 377, 56 pp., July 1944.

The same author guided another study of a very similar but more comprehensive nature in the same general region. See:

H. H. Chamberlin, L. A. Sample, and R. W. Hayes. Private forest land ownership and management in the loblolly-shortleaf type in southern Arkansas, northern Louisiana, and central Mississippi. Louisiana Agricultural Experiment Station, Baton Rouge, Bulletin 393, 46 pp., July 1945.

in the area studied, and in other respects, the two studies have been treated together in the following section. Folweiler's study treated both public and private forestlands for the state of Louisiana only. However, actual field work was concentrated on private ownerships in certain parishes selected so as to represent three major forest cover types: the longleaf-slash, the loblolly-shortleaf, and the bottomland hardwood types. Chamberlin's work was also based on certain selected representative areas, but was confined to one forest type, the loblolly-shortleaf type.

In addition to the forest cover type criterion, Folweiler based his selection of parishes (synonymous with county in Louisiana) to be studied upon those having a high percent of forestland in private ownership, the lack of agricultural development, and a highly developed forest economy. Chamberlin's selection of study areas did not coincide with political subdivision boundaries, but to qualify a study unit had to have 100 thousand to 600 thousand acres of forestland, private owners distributed among three owner classes (explained in the following paragraph), sufficient supply of standing pulpwood and sawlogs to be an economic asset to the community, good markets for timber, and that the study unit be in not more than two political subdivisions. Folweiler included nine parishes in his study area.

Chamberlin had five study units in his area, three in Louisiana and one each in Arkansas and Mississippi.

In both studies the tax records were consulted for the study areas and a list of owners compiled. On these lists owners were classified into three classes defined as follows: Class I owners owned both agricultural and forestland, Class II owners owned forestland only, while Class III owners owned a wood-utilization plant in addition to forestland. Chamberlin used these classifications as a means of stratification of owners for sampling purposes. Folweiler made no personal interviews or inspection of the property. All of Folweiler's data concerning individual properties were based upon information obtained from the public officials at the time the tax records were examined. Forest type was determined by the way the entire parish was classified for that purpose.

Chamberlin's sampling was systematic, and the rates were as follows: one-fourth of the Class I owners, one-eighth of the Class II owners, and all of the Class III owners. In all units and all classes 725 ownerships involving 268,583 acres of forest area were drawn in the sample. Type maps were prepared for all of these ownerships. Some 516 owners or administrators were interviewed personally, while 55 owners responded to a mail questionnaire. In the contact with owners, attempt was made to determine

the following: owner's occupation, objective of ownership, attitude toward forestry, forest cutting history, extent of forest practices used, owner's age, length of tenure, and method of land acquisition. The forest properties were also inspected, and a system of sampling was used to classify the forestland according to species composition, stand density, stand size, and condition class. A measure of composition and stand density was developed to simplify the work, and was called pine stocking index.

Highlights of the findings. The points of interest cited here are from Chamberlin's study unless otherwise mentioned because it is more elaborate than Folweiler's and bears more similarity to the study of this dissertation. Findings by occupation class are summarized in Table 2.

Nonindustrial owners constituted 99 percent of the forest owners but owned only 65 percent of the forest area. Generally the industrial lands had better stocking and timber volume, better protection, and better management than the nonindustrial lands.

Those owners having a negative attitude toward forestry most frequently cited incompetence in forestry and inability to spare time as the explanation for their attitudes. In over one-fifth of the cases, no attempt was made to improve the forestland because of

sheer lack of interest. Oddly, only 3 percent of the owners felt that the cost was too great in relation to the return from forest products. Fire danger and timber trespass ranked least important of all reasons for a negative attitude toward forestry.

Many owners seemed to regard their forestland as a reserve bank account, cutting it only when money was needed. In 76 of the 328 instances where timber was sold, it was because the owner was badly in need of funds.

Little correlation was found between forest productivity, measured by the pine stocking index, and length of tenure, distance of owner from forest, and occupational class. According to objective of ownership, farmers with an interest in timber growing ranked highest in terms of the productivity index, while other farmers ranked rather low. Those owners whose objective of management was listed as "existing timber values" ranked lowest of any group on the productivity index. Their interest in value was probably that of timber exploitation. Owners primarily interested in the subsurface rights ranked quite high on the productivity index.

When management and cutting practices were evaluated, industrial owners ranked highest. Within the industrial groups the large owners had the best management.

Private Forestland Ownership and Management
in Central Mississippi¹

Scope and method of the study. The area covered by this study included twenty-eight counties of 11,750,400 acres. This area was considered uniform in physiographic, economic, and social characteristics. The region was 58 percent forested, contained three important forest types and a well-developed agricultural and forest economy. Only about 10 percent of the forestland in this area was publicly owned.

In each county three sample units of four sections each were randomly selected, giving a total land area in the sample of 200,000 acres, or 2 percent of the land in the study area. On the aerial photographs for the sample areas, ownership boundaries were traced for parcels over two acres in size after the legal descriptions, and the names of owners were obtained from county tax rolls. At the same time, owners were classed as to occupation by talking with county officials, and later corrected on the basis of the sample interviewed. Forest areas for each ownership occupation class were determined from the aerial photographs. These sample

¹ Lee M. James, William P. Hoffman, and Monty A. Payne. Private forest landownership and management in central Mississippi. Mississippi Agricultural Experiment Station, State College, Technical Bulletin 33, 38 pp., April 1951.

acreages were then expanded to account for all of the known private forest acreage in the county, thence totaled for the whole study area.

Numbers of owners in each owner-occupation class were determined by expanding the sample owner number as determined by counting all owners whose northeasternmost property corner fell in the four-section sample unit. This gave an unambiguous point for exclusion or inclusion of an individual, thus preventing a bias in favor of large ownerships. Only the owners included in this count (1,738 owners) were retained on the list from which a subsample was subsequently drawn for interview.

A subsample of 600 owners was randomly selected from the owner lists previously stratified according to occupation class. The rate of sampling within owner classes was variable from class to class but proportional to the square root of the number in each stratum. Absentee owners who could not be contacted in the field were sent a mail questionnaire. Mail questionnaires were sent to 36 owners, with only 10 responding, thus reducing the intended 600 sample to 574.

When the interviews were made in the field, the owner's forest area was appraised for cutting practices (when a cut had been made since 1937 by the present owner) and fire-protection practices. Each of these properties was assigned one of six ratings

ranging from excellent to destructive. The two ratings (cutting and protection) were then combined to give a comprehensive management rating.

Highlights of the findings. Nonfarm owner-occupation classes are summarized in Table 2.

General property taxes averaged about 15 cents per acre, and seemed to offer no correlation with management practices. In terms of length of tenure, one-fourth of the forest area was held over twenty-five years, but these areas did not have significantly better management than other length-of-tenure classes. Over one-half of the forest area was owned by resident owners. It was found that generally those owners who lived farther than fifty miles from the property had poorer management than those living nearer.

Objective of ownership did offer some correlation with management practiced. Owners whose objective was to produce for their own mill did generally practice better management than those with objectives of ownership designated as farm usage and growing timber for sale. Those with miscellaneous objectives (12 percent of the area) had the proportionately highest share of destructive management.

Some cutting was done on most forest areas in the ten years prior to the study. Owners of 30 percent of the forestland did some

cutting in 1947. The Mississippi Forest Harvest Act was found to have been somewhat effective in preventing complete clear cutting.

One-third of the owners were interested in public technical forestry assistance if free, and two-thirds did not care to have it, free or not. Very few owners were interested in hiring technical forestry help at a percentage of the gross stumpage value when sold. Most owners thought this move would not justify the cost. It was also found that most owners thought a public forestry credit program would improve forest management very little. Few owners showed any interest in any type of forest credit scheme, and most owners did not think a lack of credit a management hindrance.

Practically no owners suggested that forestland taxes deterred them from better forestry practices. Also, few owners indicated that improved public fire protection would lead them to improve their forest practices.

Owners of 44 percent of the poorly managed forest explained their poor timber management by such reasons as: lack of interest in forest production because of other more important activities, preference of present high stumpage prices over uncertain prices of the future, need to liquidate to raise cash, belief that woods do not need care, inability to supervise because of other demands or

physical limitations, discouragement with long periods between incomes, and because they live too far away.

Older Studies in Michigan

It was mentioned earlier (Chapter I) that the northern portion of Michigan's Lower Peninsula has long been recognized as a land-use problem area. Over the years this area has attracted the interest of many investigators who have written many manuscripts dealing with the situation. Some of these writings simply represented the opinions of the writers. Some represented the opinions of many persons and took the form of inquiries or special reports to the legislature or governor. Still other publications represented the findings of actual research or fact-finding surveys.

It is impossible to review here or even mention all that has been written about the land and people of the area embraced by this study. Furthermore, such a complete treatment of the older literature would contribute little to this manuscript beyond that which was mentioned in the historical background (Chapter I). Hence, the treatment here is very limited.

Some studies predated 1920. Before the turn of the century, reports of very limited research conducted by the staff of the

Michigan Agricultural College (Professor W. J. Beal in particular) advised of the futility of attempting to practice agriculture on many of the soils of northern Michigan. At about the turn of the century some of the monumental names in American forestry (F. B. Fernow, Filibert Roth, etc.) went on record concerning forestry problems in Michigan.

Most notable of the old reports was that of the Commission of Inquiry on Tax Lands and Forestry made to the governor and legislature¹ as a result of investigations called for by the 1907 legislature which created the commission. Its stated purpose was set forth:

A comprehensive plan for the protection, improvement, utilization, and settlement of the delinquent state tax lands, now owned or that may hereafter be acquired, and for the better and more economical administration of the affairs and the business of the State connected therewith, and with other denuded waste or forest land; to the end that henceforth a consistent and complete policy may be pursued in reference thereto.

Included in the report were the testimonies of many leading citizens, lumbermen, et cetera. The possibilities of using the non-agricultural lands of the problem area for sustained yield forestry were discussed and deemed possible.² Recommended tax reforms

¹ Commission of Inquiry. Op. cit.

² It should be remembered that as of 1907 there was still considerable public apprehension concerning the actual physical possibilities of growing new tree crops, particularly pine, on the cut-over lands.

were suggested to make forestry a more feasible enterprise. Also of interest were the recommendations concerning state land disposal policies to prevent "timber skinning" and reversion to the state of lands sold to individuals.

Michigan's land economic survey. In 1917 the governor signed into law a bill calling for the establishment of the survey, but actual work did not get underway until 1921. Many agencies cooperated on the project, and work moved slowly until procedures were established. Work amounted to an inventory of all resources.

The purpose of the land economic survey was well put by Horace Andrews, an early worker on the project, when he said:

When a business organization gets in a bad way and goes bankrupt, the receivers usually take an inventory of its property and condition in order to decide what to do with it. They are not so much interested in what happened, whether it was mismanaged, etc., as in the cold facts as to just what assets it has, where they are and what they are worth. They have to have these facts in order to decide what to do. So they take an inventory and get the facts.¹

Many of the counties of norther Michigan were nearly bankrupt, and something had to be done.

Much of the inventory consisted of making maps in considerable detail, depicting: forest types and cleared land, soil types and

¹ Horace J. Andrews. The Michigan land economic survey. Ames Forester, 1924, p. 39.

the topography, intent of land ownership, assessed valuation, tax delinquency, and tax rate. In this way, by comparing the maps, correlation between the physical resources and the economic and social situation was possible.

Ultimately, the procedure just outlined made possible recommendations leading to wiser land-use policy by all concerned.

Trends in land use in northern Michigan.¹ This study, made in 1939, was intended as a fifteen-year comparison with the situation at the time of the Michigan land economic survey. The study was concentrated in four typical counties. A mapping approach was used but not as detailed as that used fifteen years before. Also, aerial photographs were relied upon extensively.

In the four counties it was found that forest cover had actually shrunk by about 2 percent over the period, while area in farms increased by 1 percent. Considerably more shifting had taken place than these figures would indicate, however, because gains and losses tended to offset one another. Abandoned land had increased by 38 percent.

¹H. J. Andrews and W. S. Bromley. Trends in land use in northern Michigan, a study of Alpena, Antrim, Ogemaw, and Roscommon Counties. Charles Lathrop Pack Forestry Foundation, Washington, 1942, 45 pp.

Soil-type maps were compared with changes that had taken place in land use. It was found that a strong correlation existed between farm abandonment and poor soil types. Likewise, lands which had reverted from forest to farm were mostly of better soils, but not entirely. At the fifteen-year rate of abandonment of the poor farm soils it was ascertained that thirty-two years would be required for the adjustments to take place in land use which seemed destined to occur eventually.

Much improvement was noted in the forest cover situation in the fifteen-year period, mostly attributable to improved forest fire protection. It was noted that the improvement in forest cover had taken place more rapidly on the better soil types.

The changes in land ownership which had taken place in the wildland zone were significant. Small private, large private, and corporate ownership had all decreased, while state and federal ownership had increased. The hunt club group was the only private ownership class to show an increase during the period.

Objectives of ownership determinations were made by asking owners or persons knowing the owners in the counties studied. Indications were that about one-third of the wildland was being held for expected farm value. Hunting and fishing was the second most important objective, accounting for nearly 15 percent of the wildland.

Other objectives in order of their importance were for sale purposes, summer resort, mineral values, and timber values. Timber values accounted for only 3.5 percent of the wildland ownership objectives, and nearly all of these owners indicated planning horizons of less than twenty years; i.e., their interest in timber was to make a harvest during that period.

Total assessed valuation of private land had shrunk in the fifteen-year period, but a slight increase was noted in the period 1935 to 1939. This small increase was attributed to recreational development.

Rural populations in all of the counties increased during the period 1920 to 1940. However, 1930 was the low point. Since the use of rural land for farming increased very little, it was assumed that resort development was the primary cause.

Other Ownership Studies

Miscellaneous studies. Many studies less elaborate and less closely related to the problem of this thesis have been made in the United States. Several of these were master's theses,¹ and were

¹See, for example: W. C. Hopkins. Stability of forest land ownership in the United States, a study of the shifting ownership of forest lands, of the causes back of it, and the results thereof. Un-

based mostly on library work or field work limited to a single county.

In several states elaborate studies similar to the Michigan land economic survey have been made. Notable among these studies were ones made in Wisconsin and California.¹ These studies placed more emphasis upon the entire rural land economy of the region and less on soils than the Michigan study. Forestry was an important part of both studies.

Some literature has been published on the scope and methods of forestland ownership studies. These are treated in Chapter III as they relate to this study.

Private forest management in the Tennessee Valley.² Although the name does not indicate it, this study was basically an ownership

published M.F. thesis, Yale University, 1941, 110 pp. Also: T. R. Moberg. Tenure and use of privately owned farms and forests in Durham County, North Carolina. Unpublished M.F. thesis, Duke University, 1942, 52 pp.

¹See, for example: Committee on Land Use and Forestry. Land use in Wisconsin. State Executive Office, Madison, April 1932, 155 pp. Also: David Weeks, A. E. Wieslander, H. R. Josephson, and C. L. Hill. Land utilization in the northern Sierra Nevada. Giannini Foundation, Berkeley, 1943, 127 pp.

²Tennessee Valley Authority. Private forest management in the Tennessee Valley. Tennessee Valley Authority, Norris, Tenn., 13 pp., 1954.

study. The brief report on the findings of the study indicated that a sampling procedure using 319 sampling areas was employed. Within these areas 651 land owners were interviewed, and their woodlands inspected.

It was found that 54 percent of the area was forested, with 82 percent of this in private ownership. Cutting practices were poor on 52 percent of the land, fair on 36 percent, and good on only 12 percent of the private forestland. Management was rated by a composite rating of degree of planning, logging control, grazing control, employment of a cutting budget, fire protection, reforestation, timber cutting system, insect and disease control, and improvements.

Area owned by occupation classes other than farmers is summarized in Table 2. With respect to management by occupation groups farmers rated quite low. Housekeeping (housewives), professional people, and sawmill operators also rated low in terms of percent of area owned with good management. As usual, wood manufacturing industries had the best management.

Better forest management was found on the increase. Also, as usual, larger owners were found to be using better forest management than small owners.

TABLE 2

DISTRIBUTION OF "OTHER"^a PRIVATE COMMERCIAL
FORESTLAND BY OCCUPATIONAL GROUPS IN
SELECTED AREAS OF THE
UNITED STATES

Occupational Group	23 New England Towns	Ten- nessee Valley	Central Missis- sippi	Four Areas in Ark., La., and Miss.	North- west Cali- fornia
(percent of forest area)					
Business and pro- fessional people . .	36.7	35.9	48.1	51.4	68.0
Wage and salary earners	14.5	26.4	18.5	17.2	5.8
Housewives	10.5	15.1	23.8	17.0	2.9
Retired persons . .	16.6	(b)	(b)	14.4	9.4
Dealers in forestland	5.5	(b)	2.8	(b)	(b)
Nonforest industries	5.9	15.1	(b)	(b)	(b)
Miscellaneous	10.3	7.5	6.8		13.9
Total	100.0	100.0	100.0	100.0	100.0
(acres)					
Size of sample . . .	160,873	(c)	(c)	31,507	(c)

Source: H. R. Josephson and John R. McGuire, U.S. Forest Service. Ownership of forest land and timber, Section D, Chapter IV, Timber Resources Review (preliminary review draft), Sept. 1955, p. 39.

^a"Other" denotes the exclusion of farm and industrial owners.

^bNo separate estimate given. If identified, these properties may have been included in the miscellaneous group.

^cNot published.

CHAPTER III

STUDY PROCEDURE AND SAMPLING TECHNIQUE

This chapter is devoted to a discussion of the methods used in this study commencing with the Michigan Forest Survey, to which this study was correlated. A considerable portion of the raw data used in this study were common to both projects.

Forest Survey's Method of Sampling

The Michigan forest survey is part of the forest survey of the Lake States region, which in turn is part of the nationwide forest survey. This inventory of the nation's forest resources was authorized by the McSweeney-McNary Forest Research Act of 1928. It has grown to be one of the most important research functions of the United States Forest Service. The present survey in the Lake States region, conducted by the Division of Forest Economics of the Lake States Forest Experiment, is the second complete inventory of the region.

The study area shown in Figure I is known as District 3 of the Michigan forest survey. The area consists of thirty-one counties,

which are further subdivided into five blocks (Figure I) for computation purposes.

Method of forest area determination.¹ The forest survey was based upon aerial photographic methods supplemented by ground checking. Forest area was determined by placing a transparent grid with systematically spaced dots over aerial photographs at the intensity of ten thousand dots per million acres. The ratio of dots falling in forest to the total number of dots falling on land area was then multiplied by known land area totals to yield the estimate of total forest area. Prior to this operation, however, a portion of the forest and nonforest dots were ground checked and a correction factor applied to the dot count.

Method of selecting sample for condition class area and volume. During the dot count on the aerial photographs, every sixth dot falling in forest located a sample forty-acre tract. The forty, 20 chains by 20 chains, was then adjusted to coincide with ownership lines with the referenced dot still enclosed.²

¹This section is based mostly upon: Lake States Forest Experiment Station. Forest survey handbook, Lake States, 1952. U.S. Forest Service, Lake States Forest Experiment Station, St. Paul, 66 pp., 1952.

²This method was used in the northern portions of the states of Michigan, Minnesota, and Wisconsin. A different system was used

The forty then became the basic sampling unit for estimating forest detail. This was accomplished by subdividing the sample forties into standard types, size classes (see Appendix A for definitions), and densities as they were mapped from the aerial photographs. A fraction of these mapped forties were ground checked by field men to serve as a basis for correcting the forest area data tabulated from all sample forties.

In order to determine average volumes per acre in the different stand condition classes, sample ground plots were taken by field crews at the time the fraction of sample forties were being ground checked. These plots consisted of two concentric circles. On a one-fifth acre plot trees six inches in diameter and larger were measured while smaller trees were measured on a one-fiftieth acre plot. Plots were randomly located and allocated to different condition classes approximately proportional to the square root of the volume per acre in that condition class.

Forest ownership determinations. At the time of ground checking the crew leader checked the ownership of each sample forty by consulting county records and/or county officials. Privately

in the southern portions of these states which is primarily an agricultural region.

owned forties were classified into three broad ownership classes. These were large private (5,000 acres and larger), small private (less than 5,000 acres), and farm. Most of the publicly owned forties were classified prior to this from national and state forest maps.

Forest areas by condition classes for each ownership category except small private were worked up separately. The residual between the total and the sum of all other categories was assigned to small private. Volumes were prorated to ownership classes according to condition class acreage.

Sampling accuracy sought. The forest survey of the Lake States was designed to estimate total forest area with a standard error of no more than 1 percent for a typical 700,000-acre county which is two-thirds forested. Sampling for volume per acre was designed to be within a standard error of 3 percent per billion cubic feet or within about 8 percent for a typical county. Where local cooperation made possible more intensive work it was the policy to strive for greater accuracy.

The First Subsample

This portion of the study was conducted in close cooperation with the forest survey conducted by the United States Forest Service, which supplied the forest resource data. It primarily deals with the sampling by mail of 406 township officials between August 1953 and December 1954, inclusive. Their replies and the analyses of them formed the basis for Chapter IV.

Method of sampling. All of the ground checked sample forties designated as privately owned in the forest survey were chosen for further ownership study. There was a total of 3,046 of these in the study area, and they were assumed to be randomly distributed with respect to ownership. By checking the legal descriptions of these forties against the public land survey descriptions for political townships obtained from the Michigan Conservation Department it was possible to separate the sample forties by political township.

In the state of Michigan the township supervisor maintains the township assessment records and places the valuation upon real estate in his township for tax purposes. Thus the township supervisor usually has the most up-to-date ownership records for rural lands. Also, since the township is a much smaller unit than the

county, it was felt that township officials would be more likely than county officials to know owners personally.

Extent of coverage and information sought. From the Michigan Department of State the names and addresses of all township supervisors were obtained for the thirty-one-county area. Each of these 406 officials (Table 3) was then sent mail questionnaires to determine the owner's name and address, his occupation, his distance of residence from the property, and size of owner's total forest holding for each owner of each sample forty falling in that supervisor's township. A sample of the questionnaire (Form 53 FL01) is to be found in Appendix B, as well as the letter which accompanied it.

Although several bits of information were sought on this questionnaire, emphasis was placed upon determination of the owner's occupation class. These classes, which are defined in detail in Appendix A, were the basic means of owner stratification for this study. One of the basic assumptions of this study was that there is considerable homogeneity within occupation classes with respect to behavioral attitudes of forest owners. Also, of course, occupation serves as a convenient means of classification.

Altogether, 3,046 questionnaires (Table 4) were sent to 406 township supervisors (Table 3), or an average of 7.5 questionnaires

TABLE 3
RESULTS OF MAIL QUESTIONNAIRE SAMPLING
OF TOWNSHIP SUPERVISORS

Item	Block ^a					Total
	Cadillac	Baldwin	Gladwin	Mio	North Tip	
(number of townships)						
Initially con- tacted	81	101	70	43	111	406
Replied after first contact . .	45	52	35	27	46	205
Replied after second con- tact	16	38	22	8	46	130
Total replies ^b . .	61	90	57	35	92	335

^aBlock locations are shown in Figure I.

^bPercent responding by block were: Cadillac, 75; Baldwin, 89; Gladwin, 81; Mio, 81; North Tip, 83; and Total, 82.

TABLE 4

RESULTS OF SAMPLING TOWNSHIP SUPERVISORS AND
INDIVIDUAL OWNERS NOT CLASSIFIED
BY SUPERVISORS

Item	Block					Total
	Cadillac	Baldwin	Gladwin	Mio	North Tip	
(number of questionnaires)						
Sent to super- visors	512	945	487	287	815	3,046
Returned by supervisors . .	349	667	329	173	536	2,054
Sent to indi- viduals	60	100	73	39	91	363
Returned by individuals . . .	28	29	20	20	42	139
Classed for occupations . .	298	478	239	131	410	1,556
Classed for distance	289	460	230	129	403	1,511

per township. Some 205 supervisors replied after the first contact; an additional 130 responded after as many as two reminders were sent. In aggregate, 82 percent of the officials solicited replied, returning 67 percent of the questionnaires sent to them (Tables 3 and 4). It was, of course, assumed that this response was random with respect to ownership.

One can see from examination of Table 3 that the response did not vary greatly with respect to geographical location. This response varied between 75 and 89 percent from block to block. Also, in terms of questionnaires returned (Table 4), the response was rather uniform.

Supplementing the results by direct mail and total response.

A considerable proportion of the questionnaires returned by the township officials supplied the owner's address, but no occupation class. It was apparent from examining these that the local officials did not know absentee owners as well as they knew local residents. In order to minimize this bias a very simple mail questionnaire was sent directly to 363 individuals of the type just described. Some 38 percent (Table 4) of these were returned in an acceptable condition.

As a result of the response from both the township officials and individual owners, 1,556 questionnaires (Table 4) representing

an equal number of sample forties were classified for owner's occupation. By both means plus map checking of about four hundred owners' addresses, 1,511 sample forties were classified acceptably according to distance of owner's permanent residence from the property.

Upon final examination of the replies it was decided to drop the analysis of size class of ownership. The response to this question was very meager, and in addition it was realized that the size classification used was inadequate. Most of the usable replies fell in the 0 to 500 acre class.

Computational methods for forest area and volume. From each sample forty within owner occupation classes the commercial forest acreage was tabulated according to its previously mapped forest condition class. This tabulation was made by eleven occupational classes, thirteen forest types, six forest stand-size classes, and three stand density classes, and for each forest survey block (Figure I).

In this fashion the sample 47,166 acres of commercial forestland were tabulated for the thirty-one-county study area. This sample constituted 0.96 percent of the total commercial forestland estimated in the study area by the forest survey.

In order to estimate forest area by occupation class the ratio-estimator technique as described by Cochran¹ was employed. This statistic was found to be more efficient than simple expansion for making such estimates.

The ratio estimates were made as follows: For estimating farmer-owned forest acreage, for example, the ratio was:

$$\frac{\text{total farmer-owned commercial forest area in sample}}{\text{total commercial forestland area in the sample}}$$

This ratio was then applied to the total privately owned forestland estimated for the study area by the forest survey.

Within occupation classes the same technique was used for estimating forest area by all variable combinations which constitute a forest condition class. For example, to estimate farmer-owned aspen pole timber, the ratio was:

$$\frac{\text{total farmer-owned aspen pole timber area in sample}}{\text{total aspen pole timber area in the sample}}$$

This ratio was then applied to the total privately owned aspen pole timber area estimated by the forest survey. A similar process was used for estimating areas by distance class of owner from property.

All of these area computations were made separately by individual forest survey blocks in order to minimize geographical

¹William G. Cochran. Sampling techniques. New York, John Wiley and Sons, 1953, p. 129.

differences in the timber stand. In order to make the area estimates alone over five thousand separate divisions and an equal number of multiplications were required. Combining the results required at least as many separate operations in addition.

Volumes were computed in a similar fashion with area ratios being employed to prorate forest survey volume totals for a particular condition class. For example, the ratio cited immediately above would have been multiplied by the forest survey volume total for privately owned aspen pole timber in order to estimate farmer-owned aspen pole timber volume.

Accuracy of sampling. This entire study is based upon a sampling procedure, and therefore involves some possible error due to the chance that the means of the samples drawn may not have coincided with the true means of their respective populations. That is the type of error which is discussed here. Its evaluation bears no relationship to other types of errors which may have been involved in this study and for which the author must assume full responsibility. The sampling errors discussed here pertain to the figures presented in the next chapter.

One check on the data was possible by making a comparison with a known total. The farmer and part-time farmer occupation

classes combined correspond closely with the Census Bureau's definition of a farm owner. It therefore follows that the total forest acreage held by these two groups should agree approximately with the total farm forest acreage listed by the Census Bureau for the thirty-one-county study area. These two figures were remarkably close. The Census Bureau¹ listed 1,487,033 acres of farm forestland, while this study showed 1,475,300 acres.

These results were particularly phenomenal when one considers that the ratio estimators described in the previous section were applied to the total of all private forest acreage determined by the forest survey. In other words, the estimators for the two farmer classes were not applied to forest survey estimated farm-owned forest acreage separately.

In addition to this check, statistical error computations were made on the estimates of total forest acreage by owners' occupation classes. The results of this which show the probable maximum magnitudes of the sampling errors are presented in Table 5.

The formulas² for making these computations and the basic assumptions they involve are included in Appendix C.

¹U.S. Bureau of the Census, United States Census of Agriculture, 1950. U.S. Government Printing Office, Washington, Vol. 1, Pt. 6, 1952.

²Derived by the Statistical Laboratory, Iowa State College, Ames.

TABLE 5

COMMERCIAL FORESTLAND AREA BY OWNERS' OCCUPATION
CLASS AND APPROXIMATE SAMPLING ERROR

Owner Occupation	Forest Area		Error of Estimate ^a (percent)
	Percent ^b	Acres	
Forest industry	1.8 - 2.6	108,500	20.3
Nonforest industry	4.2 - 5.4	235,800	12.6
Farmer	20.3 - 22.5	1,048,300	5.0
Part-time farmer	8.0 - 9.4	427,000	8.7
Business-professional	14.0 - 16.0	734,800	6.8
Wage earner	10.1 - 11.7	536,200	7.6
Housewife-widow	6.9 - 8.3	370,600	9.6
Recreational group	12.1 - 14.1	641,300	7.7
Real estate	8.2 - 9.8	441,800	9.5
Undivided estate	2.8 - 3.8	161,700	15.7
Retired	3.5 - 4.5	195,200	13.6
Total		4,901,200	

^aError of estimate of forest area to one standard error.

^bMaximum and minimum range estimated at average plus or minus one standard error.

The Subsample for Field Interview

This portion of the study deals with the interviews of 229 forestland owners in the study area made during the summer of 1954. These interviews and the analyses of them formed the basis for Chapters V through X.

Method of sampling. At the time of the selection of the sample for field interview, 1,265 sample forties had been classified according to owner's occupation class. This was based on the usable replies received from the township officials just prior to the beginning of the field work. The distribution of these replies by owner occupation class is shown in Table 6. These were then assumed to represent the population of owners for selection of the field sample.

It was decided upon the basis of funds and time available that two hundred field interviews could be taken. In order to allocate this sample among the different owner classes, a somewhat novel approach was chosen. This method, which has been referred to as the "maximum possible binomial variance," was intuitively devised so as to satisfy requirements for minimum sampling of small classes without heavy sampling of large classes. It was realized that equal sampling of all classes would have resulted in heavily sampling unimportant classes. Also, it was felt that sampling

TABLE 6
ALLOCATION AND ACCOMPLISHMENT OF FIELD INTERVIEWS
BY OWNER OCCUPATION CLASS

Occupation Class	No. of Sample Forties	\sqrt{N}	Sample Allo- cated ^a	Actually Sampled
Forest industry ^b	36	-	36	20
Nonforest industry	65	8.06	13	7
Farmer	400	20.00	32	36
Part-time farmer	155	12.45	20	33
Business-professional . . .	133	11.53	19	32
Wage earner	157	12.53	20	26
Housewife-widow	100	10.00	16	18
Recreational group . . .	87	9.33	15	17
Real estate	63	7.94	13	17
Undivided estate	35	5.92	10	11
Retired	34	5.83	10	12
Total	1,265	103.59	204	229

^aAllocated according to maximum possible binomial variance. For example, allocation to the farmer class was computed as:

$$20.00/103.59 \times 164 = 32.$$

^bA 100 percent sample was chosen in the forest industry class, leaving a theoretical 164 interviews to be allocated.

directly proportional to number of individuals in each class, which would have minimized variance of mean proportion, would have resulted in light sampling of some other classes.

In order to overcome these difficulties, it was postulated that it was desired to optimize estimates of variation of yes-and-no answers rather than mean proportion. A scheme which would allocate interviews proportional to the square root of the number in each class would accomplish this; i.e., it would be optimum for stratified sampling with respect to the variance or coefficient of class variation.¹

In allocating the sample of 200 interviews according to this scheme it was decided to interview all 36 owners in the forest industry class because of their importance in the forest ownership picture. Thus, it became a problem of allocating 164 interviews, and the results of this allocation appear in Table 6. Rounding upward to the nearest whole number resulted in a total of 204 allocated interviews in all ownership classes.

¹In other words, the optimum allocation for stratified sampling would be proportional to:

$$N_i \sqrt{V^2/2N_i} = K \sqrt{N_i} ,$$

where N_i = the number in the i th stratum, and V = the variance.
See: William G. Cochran. Op. cit., p. 35.

It was decided also that travel limitations prohibited the sampling of any owners in the metropolitan Detroit area or those residing south of a line running from Pontiac through Lansing to Grand Rapids, but with the single exception of Jackson. It was felt that owners living in such cities as Flint, Saginaw, Bay City, Pontiac, Lansing, Grand Rapids, and Muskegon would adequately represent the attitudes of urban residents who were owners of forestland. Thus in the actual draw of sample forties by random numbers if the owner did not meet these criteria the sample forty was returned and another draw made. Likewise, if a forty was drawn whose owner had been selected for interview by a previously drawn forty, the card was returned and another draw made. At the time of the draw an equal number of alternates was selected by the same system.

Extent of coverage and information sought. As field work progressed it became apparent that more interviews could be made than originally anticipated. Thus extra interviewees were added as the convenience of travel warranted from the group of alternates. Also, there was considerable misclassification among the forest industry classes, and many such owners after interview were corrected to another class. These two processes combined resulted in the random accumulation of more interviews than had been planned.

The total number thus accrued rose to 229. The spread of this number by occupation class is shown in Table 6.

The details of the information sought by the interview can be seen by examination of the questionnaire in Appendix B. Foremost among the information determined at the time of the interview was the total forest area owned by the interviewee in the study area. Also, at the same time some inspection of the woodland was made if it were convenient. Chapter VI treats this latter point in more detail.

The interview technique employed was to avoid direct questioning except for a few questions which required a very specific answer. Generally the attempt was to draw out the owner's feelings through conversation so as to avoid filling out the form in his presence. The form was then completed after a short drive from the place of the interview.

Supplementing the field interview by mail. Despite the fact that a considerable number of interviews were made among urban dwelling absentee owners it was felt that more information was needed on absentee owners to avoid possible criticism. Thus a mail questionnaire was devised to obtain approximately the same information from a sample of such owners as had been obtained

through the field interview. A sample of the questionnaire used and the letter which accompanied it are included in Appendix B. Certain questions which proved comparatively irrelevant at the time of the field interview were omitted from this questionnaire in order to shorten it.

An unbiased selection of owners to canvass by this method was made by selecting all absentee owners who had been classified according to occupation class by the township supervisor and whose mailing address was provided. A total of 163 questionnaires (Table 7) were sent to such owners. After one reminder was sent to all nonrespondents, a total of sixty-three replies were received. An additional seventeen questionnaires were returned for insufficient address.

Computational methods for field interview analysis. The 229 field interview questionnaires were coded and punched on IBM cards to facilitate sorting and tabulating. The questionnaires returned by mail were not put on IBM cards, but their analysis was handled in the same way as the others. However, both groups of questionnaires were handled entirely separately.

In order to analyze the response in terms of forest area owned by persons answering a particular question in a certain way,

TABLE 7

RESULTS OF MAIL QUESTIONNAIRE SAMPLING OF INDIVIDUAL
ABSENTEE OWNERS PREVIOUSLY CLASSED INTO
OCCUPATIONS BY TOWNSHIP SUPERVISORS

Block	Question- naires Mailed (number)	Response	
		Number	Percent
Cadillac	19	5	26
Baldwin	35	11	31
Gladwin	29	9	31
Mio	29	10	34
North Tip	51	28	55
Total	163 ^a	63	39

^aIncludes seventeen questionnaires which were returned for insufficient or incorrect address.

a system of weighting individual owner cards was devised. Also, inasmuch as the sampling rate was variable from occupation class to occupation class, this is the only way comparisons across owner classes could be made.

The weighting system involved the ratio estimator type of technique described earlier in this chapter. The ratio estimator in this case became:

$$\frac{\text{total forest area owned in the study area by the person interviewed}}{\text{total forest area owned by persons in this occupation actually interviewed in the field}}.$$

This ratio was then multiplied by the total forest area estimated to be owned by that particular occupation class¹ in the study area.

This figure became the weight for the individual owner interviewed. The proportionate area response to a particular question was obtained by summation of the weights of owners answering a particular question in a certain way.

The analysis in terms of owner numbers was somewhat more involved. At the time the dot grid was used on the aerial photograph, its probability of locating a sample forty, and hence a sample owner for interview later, was directly proportional to the owner's area. Thus, in order to make estimates in terms of numbers of forest owners, it was necessary to weight individual owners' cards

inversely with the area weight previously assigned to the cards and just described in the paragraph above.

The final analyses in terms of both forest area represented and number of owners represented by a particular response was not made in terms of actual area or actual numbers. Rather, it was made according to proportion of owners responding in a particular way.

A considerably less sound estimate of actual owner numbers and average size of forest holding by owners' occupation classes was made, and appears in Table 16. In this estimate average-sized holding was computed by simply dividing the number of owners interviewed in that occupation class by the total forest area owned by such persons as determined by the field interview. This average-sized holding was thence divided into the estimate of total forest area owned by a particular occupation class as determined at the first subsample level. The weakness of this estimate stems from the small sample on which it was based and the fact that there was a greater probability of a large owner coming into the sample than a small owner. This resulted from the way the sample forties were initially selected. The bias introduced in this way, however, could have had no more than a negligible effect on other statistics presented in this study.

CHAPTER IV

OWNERS OF THE FOREST RESOURCE

It is the purpose of this chapter to examine the forest resource held by private owners in the study area. Here the concern is who owns what and how much. This information is presented as a rather detailed inventory of the forest resource held by different classes of private forest owners. This information is basic to the questions of private ownership treated in subsequent chapters.

The data presented in this chapter are based on inventory figures supplied by the Forest Survey. Thus the totals presented herein correspond with Forest Survey, District 3, Michigan, statistics for all private ownership classes except for discrepancies due to rounding and computational techniques. Computational methods were described in the preceding chapter.

Forest Areas

All forest area data presented in this study refer to commercial forest area. Commercial forestland is defined as land bearing or capable of bearing pole-timber or saw-timber stands of commercial character, and which is, or is likely to be,

commercially available.¹ Most forestland in Michigan is classed as commercial. The previous forest survey showed that less than 4 percent of the forest area belonged in the noncommercial class.² Other special terms used in this chapter are defined in Appendix A.

Forest area by occupation class. Table 5 included in the preceding chapter shows the relative distribution of commercial forest acreage among occupation classes.

The largest single owner class was the farmer class, with over one million acres. The farmer and part-time farmer classes combined accounted for about three-tenths of the privately owned commercial forest acreage. These two classes of farm owners combined correspond with the Census Bureau's definition of farm owners, and, as pointed out previously, the total forest acreage figures for farm owners are in remarkably close agreement between the census and this study.

¹Lake States Forest Experiment Station. Forest types and condition classes in the Lake States. U.S. Forest Service. Lake States Forest Experiment Station, Miscellaneous Report No. 2, June 1948, p. 2.

²R. N. Cunningham et al. Forest resources of the Lake States Region Forest Service. USDA, Washington, Forest Resource Report No. 1, 1950, p. 6.

Forest industries were found to own less acreage than any other group despite the necessity for their reliance upon the forest resource. Nonforest industries who hold land for many different reasons were found to own more than twice the acreage of that owned by forest industries.

The business-professional class was the second largest single owner class with recreational groups third. The 13 percent owned by recreation groups may appear low to some observers. However, a considerable portion of the land held by other groups, particularly the wage earners, business-professional, and real estate groups, was being held for recreational purposes. This is discussed at some length in the next chapter.

Forest areas by occupation class and block. The proportion of forest area held by occupation classes varied considerably in different portions of the study area. This is brought out in Table 8, which shows the distribution by block (Figure 1). The farmer class was the largest owner in only three individual blocks. Of the two remaining blocks, the business-professional group leads in one, recreational groups in the other. In the Mio Block recreational groups held more than twice the forest acreage of any other class. The Mio Block was also distinctive in that the real estate class was

TABLE 8

COMMERCIAL FORESTLAND AREA BY BLOCK AND
OWNERS' OCCUPATION CLASS

Occupation Class	Block ^a				
	Cadillac	Baldwin	Gladwin	Mio	North Tip
	(thousand acres)				
Forest industry . .	15	16	8	47	22
Nonforest industry	44	58	52	24	58
Farmer	261	272	107	66	342
Part-time farmer .	111	96	53	55	112
Business- professional . . .	96	104	128	111	296
Wage earner	129	145	84	38	140
Housewife-widow . .	61	100	51	62	97
Recreation group .	71	47	17	262	244
Real estate	22	65	54	122	179
Undivided estate . .	14	42	40	23	43
Retired	20	49	30	32	64
Total ^b	844	994	624	842	1,597

^a See Figure I for location of blocks.

^b Block totals may not correspond with Forest Service published statistics due to rounding within occupation classes.

the second largest owner, and that forest industries held a larger portion of this block than any other. Nonforest industries, on the other hand, held the smallest share of their acreage in the Mio Block.

Some owner occupation classes held a remarkably consistent portion of the forest area from block to block. Particularly notable in this respect was the housewife-widow group, and to a lesser extent the retired class.

Forest area by occupation class and stand-size class. Forest acreage in itself does not tell anything about the distribution of the forest resource on the land. Probably the best measure available to depict this type of story short of actual timber volumes is that of stand-size class.¹ This analysis is presented in Table 9. It is based upon the assumption that the higher the proportion of acreage in the larger timber classes the better the inventory, and vice versa. This is, however, not necessarily an indication of poor handling by the present owner.

An examination of Table 9 does not reveal any drastically significant differences. A few points do stand out. The recreational

¹ See definitions of terms in Appendix A.

TABLE 9

COMMERCIAL FORESTLAND AREA BY OWNERS' OCCUPATION
CLASS AND STAND-SIZE CLASS

Occupation Class	Large Saw- timber	Small Saw- timber	Pole Timber	Seedlings and Saplings		Non- stocked
				Satis- fac- torily Stocked	Poorly Stocked	
(thousand acres)						
Forest industry .	2	5	44	23	14	20
Nonforest industry	1	10	75	76	20	54
Farmer	33	88	338	213	91	285
Part-time farmer	5	26	148	75	35	138
Business- professional .	6	26	295	176	69	163
Wage earner . .	14	21	198	107	49	147
Housewife- widow	4	24	129	64	40	110
Recreation group	5	22	283	154	68	109
Real estate . . .	5	20	165	107	34	111
Undivided estate	6	4	74	33	9	36
Retired	4	6	51	52	15	67
Total	85	252	1,800	1,080	444	1,240

group had a smaller portion of forestland in the large-sized classes than any other group. Farmers, quite surprisingly, had a larger proportion of their acreage in the large timber classes than any other group.

On the lower end of the scale, the outstanding owner class was the retired group, with the highest proportion of acreage in the nonstocked size class. Also, the part-time farmer and housewife-widow groups held a somewhat similar stand-size class distribution but theirs was less pronounced.

Forest area by occupation class and forest type. Another variable which enters the forest resource picture is that of forest type. Forest type is defined as a forest characterized by the predominance of one or more key species.¹ Since some species, notably conifers, are traditionally the most valuable, it follows that types in which such species predominate represent a valuable inventory. Inventories consisting of a large portion of acreage in brushy or low-grade hardwood stands would represent a poor inventory. Table 10 depicts this story for the study area.

Considering the jack, red, and white pine types together, two ownership classes, recreational groups and business-professional

¹See Appendix A for more complete definitions.

TABLE 10

COMMERCIAL FOREST AREA BY OWNERS' OCCUPATION
AND FOREST TYPE

Forest Type	Forest Industry	Non- forest Industry	Farmer	Part- time Farmer
(thousand acres)				
White pine	1	3	7	(a)
Red pine	0	7	8	1
Jack pine	13	10	8	2
Spruce-balsam fir	3	6	11	2
Black spruce	1	6	1	(a)
Tamarack	3	(a)	7	(a)
Cedar	4	11	45	11
Northern hardwood	16	7	299	76
Oak	10	34	83	42
Ash-elm	6	9	49	19
Aspen	31	89	245	136
Upland grass-brush	13	49	222	117
Lowland brush	7	5	63	21
Total	108	236	1,048	427

^a Less than 500 acres.

TABLE 10 (Continued)

Business or Pro- fessional	Wage Earner	House- wife or Widow	Recrea- tional Groups	Real Estate	Undi- vided Estate	Retired
(thousand acres)						
4	1	1	4	1	1	(a)
7	2	0	6	4	(a)	1
36	10	12	69	24	5	1
10	6	5	25	9	3	(a)
7	1	0	13	1	3	2
11	0	0	7	0	1	(a)
31	29	6	9	16	8	11
89	79	60	58	75	22	36
71	81	37	114	44	24	19
16	27	23	14	9	14	4
290	152	117	212	149	45	54
132	120	91	89	98	30	56
31	28	19	21	12	6	11
735	536	371	641	442	162	195

people, stood out as proportionately large owners. Considering the red pine type alone the nonforest industry group held a very large proportion. Much of this pine acreage was accounted for by young plantations.

The cedar type had a rather uniform distribution among owner classes. Although the remaining coniferous types, spruce-balsam fir, black spruce, and tamarack, showed large variations among owner classes it is difficult to draw conclusions on this basis since the acreage involved was rather small. Recreational groups did hold a significantly large share of the spruce-balsam fir acreage.

Among the hardwood types, farmers held a significantly high proportion of the area in the northern hardwood type. The business-professional class held a significantly large portion of the aspen type. Nonforest industries held a proportionately small share of the lowland brush type.

Forest areas by distance of owners from property. Distance of owner from his property may have a profound influence on how he handles it, and this question is considered in more detail in subsequent chapters. At any rate, it is important for policy reasons to know where forest owners reside with respect to their forest holdings and whether some owners characteristically live further

from their holdings than others. Table 11 presents a summarization of forest acreage by owner occupation and distance from holding.

Examination of Table 11 reveals some very interesting points. Approximately one-half of the forest area was owned by people who lived farther than twenty-five miles from their forestland. Some 37 percent of the forest area was owned by persons living more than one hundred miles distant, while less than 29 percent was owned by resident owners.

As one might expect, there was a definite relationship between certain occupation classes and the distance those owners resided from their forestland. Most farmers and part-time farmers resided on or near their forest holdings. It is somewhat surprising that farmers and part-time farmers owned some forestland at a considerable distance from their current farming operations. Real estate people, wage earners, business-professional persons, and particularly recreational groups were characteristically absentee owners. Some 70 percent of the forest area owned by recreational groups was owned by groups whose owners lived more than one hundred miles from their property.

Stand-size class distribution by distance of owners from property. Here the question considered is whether distant owners

TABLE 11

COMMERCIAL FOREST AREA BY OWNERS' OCCUPATION
AND DISTANCE FROM PROPERTY

Occupation Class	Distance from Property				
	On Site	1-25 Miles	26-100 Miles	101-200 Miles	200-up Miles
(thousand acres)					
Forest industry .	21	68	19	0	0
Nonforest industry	21	25	16	161	13
Farmer	636	280	49	9	74
Part-time farmer	301	67	10	34	15
Business or professional . .	75	245	88	127	200
Wage earner	92	126	115	102	101
Housewife or widow	103	64	40	72	92
Recreation group	36	82	77	243	203
Real estate	36	82	87	124	113
Undivided estate	18	32	31	65	16
Retired	66	55	13	16	45
Total	1,405	1,126	545	953	872

possess better or poorer timber than owners living closer to their property. It is not meant here to imply that this characterizes forest treatment, because present stand conditions may reflect past owner's handling rather than that of the current owner.

Table 12 makes this presentation for three owner classes. The selection was made on the basis of the largest classes, excluding farmers and part-time farmers because most of them lived close to the property, and also excluding recreational groups because most of them resided far from their property. This approach eliminates any possible confounding influence of owners' occupation.

An examination of this table (Table 12) reveals very little if any pattern relating timber size to distance class of owner from property. In the business-professional and housewife-widow groups distant owners appear to have had most of the large timber, while owners residing near their property in these two classes had a large share of the poorly stocked stands. These same trends were observed in the undivided estate and the recreation group classes, but those classes were not presented in the table. The exact reverse of this was noted in the real estate and farmer classes, which likewise are not presented in Table 12.

TABLE 12

STAND-SIZE CLASS DISTRIBUTION BY DISTANCE OF OWNER
FROM PROPERTY FOR SELECTED OWNER
OCCUPATION CLASSES

Occupation and Distance	All Stands	Large Saw- tim- ber	Small Saw- tim- ber	Pole Tim- ber	Seedlings and Saplings		Non- stocked
					Satisfac- torily Stocked	Poorly Stocked	
(percent of forest area)							
<u>Business or professional:</u>							
On site	100	1	0	44	11	4	40
1-25 mi. . . .	100	(a)	4	38	29	9	20
26-100 mi. . .	100	0	2	45	26	13	14
101-200 mi. .	100	0	1	43	30	9	17
201-up mi. . .	100	4	4	36	19	12	25
<u>Wage earner:</u>							
On site	100	1	3	33	26	6	31
1-25 mi. . . .	100	5	9	35	18	7	26
26-100 mi. . .	100	5	2	35	23	4	31
101-200 mi. .	100	5	1	20	20	14	40
201-up mi. . .	100	2	2	43	16	12	25
<u>Housewife or widow:</u>							
On site	100	2	8	35	35	2	18
1-25 mi. . . .	100	0	4	47	6	(a)	44
26-100 mi. . .	100	0	0	43	19	14	24
101-200 mi. .	100	0	8	51	6	7	28
201-up mi. . .	100	4	5	30	24	17	20
<hr/>							
Average ^b . . .	100	2	4	38	24	9	23

^a Less than 0.5 percent.

^b Based on all occupation classes and all distance classes.

In the other classes the pattern seemed to show a neutral influence by distance of owners' residence. The wage earner class shown in Table 12 is typical of this situation.

Forest Volumes

All of the forest volume data presented in this section refer to that found in trees at least of pole-timber size.¹ Volumes for pole-timber trees are given in cords, while volumes in saw-timber-sized trees are expressed in board feet. All of the figures presented refer to net merchantable volume in live trees. In other words, cull portions of live trees, cull trees, and dead trees have been omitted from these inventory figures.

In the previous section much was implied about the condition of the forest resource with respect to its size, density, and type, with all of the data expressed in area units. In this section the inventory is expressed in actual volumes of timber present on land in different ownership classes.

Volumes by owner occupation class and kind of material.

Table 13 presents total timber volumes within each owner occupation class for the study area. The figures are broken down into two

¹ See Appendix A for definitions of terms.

TABLE 13

TIMBER VOLUME BY OWNER OCCUPATION CLASS
AND KIND OF MATERIAL

Occupation Class	Cordwood Material ^a	Saw-Log Material ^b
	(thousand cords) ^c	(million board feet) ^d
Forest industry	496	73
Nonforest industry	952	111
Farmer	4,937	918
Part-time farmer	1,889	272
Business or profes- sional	3,489	376
Wage earner	2,450	375
Housewife or widow	1,635	241
Recreation group	3,071	329
Real estate	2,039	258
Undivided estate	824	125
Retired	703	112
Total	22,485	3,190

^aIncludes net merchantable volume of pole-timber trees and upper stem of saw-timber trees.

^bIncludes net merchantable volume in live saw-timber trees from stump to a minimum four-inch top inside bark.

^cStandard Forest Survey cord of 80 cubic feet of solid wood.

^dBoard feet by the International Log Rule 1/4-inch kerf.

size classes of material based upon the principal product merchantable from the timber. Cordwood material refers to volumes in small-sized trees which are not large enough to be merchantable for saw-logs plus the tops of saw-timber trees. This material usually would be marketable for pulp if it occurred in the right species. Cordwood material is measured in units of cords, while saw-log material is measured in board feet. It is generally considered more favorable to have a high saw-log inventory than a high cordwood volume.

An examination of Table 13 for differences in volumes by occupation classes reveals that the classes rank about the same way they did in terms of total forest area (Table 5). Farmers, business-professional, and recreation groups are the leaders, in that order. The farmer class stands out in Table 13. This class had over one-fifth of the cordwood volume and nearly one-third of the saw-log volume. This significant fact can be stated in another way by saying that farmers held a higher portion of their timber volume in saw-log trees than any other class of forest owners.

It is interesting to observe that the owner classes did not rank exactly the same way in terms of saw-log volumes as they did in terms of cordwood volumes. For example, it can be seen that wage earners ranked third and recreation groups fourth in terms

of saw-log volumes, but that they exchanged positions when ranked by cordwood volumes. The first and second rankings are the same for both classes of material.

Another interesting comparison is possible from Table 13 in terms of the ratio of saw-log material to cordwood material. Presumably, the higher this ratio the better the quality of an owner's inventory. As pointed out above, farmers ranked first in this comparison, while recreation groups and business-professional people ranked lowest despite their high rank in terms of total volume.

Cordwood timber volume by species group and owner occupation class. This information is presented in Table 14. These data represent a more detailed presentation of the cordwood volumes shown in the first column of Table 13. A general and useful criterion for examining Table 14 is to assume that the higher the proportion of volume in softwoods the better the quality of the inventory.

It is interesting to note how the respective ranking of the occupation classes changes from one species group to another. Farmers had more other-species hardwood volume than any other class, but in terms of aspen volume they were outranked by the business-professional class. The recreation group ranked first in volume of softwood pulp species.

TABLE 14
CORDWOOD TIMBER VOLUME^a BY SPECIES GROUP AND
OWNER OCCUPATION CLASS

Occupation Class	Softwoods		Hardwoods	
	Pulp Species ^b	Other Species	Aspen	Other Species
(thousand cords) ^c				
Forest industry	83	40	129	244
Nonforest industry	90	88	387	387
Farmer	199	345	1,240	3,153
Part-time farmer	53	97	626	1,113
Business or professional . .	233	271	1,472	1,513
Wage earner	119	156	785	1,390
Housewife or widow	79	78	510	968
Recreation group	462	253	994	1,362
Real estate	119	154	747	1,019
Undivided estate	70	67	244	443
Retired	41	54	208	400
Total	1,548	1,603	7,342	11,992

^aIncludes net merchantable volume of pole-timber trees and upper stem of saw-timber trees.

^bPulp species included here are spruce, balsam fir, jack pine, and hemlock.

^cStandard Forest Survey cord of 80 cubic feet of solid wood.

In terms of the ratio of softwood volume to hardwood volume, the nonforest industry class stood out and the recreation group ranked second. Part-time farmers showed up poorest on the basis of this ratio. The wage earner, housewife-widow, and business-professional classes also ranked quite low by this scale of rating.

Saw-log timber volume by species group and owner occupation class. In Table 15 saw-log volumes which were first shown in Table 13 are given in more detail. The separation into species groups shown here is the same as that used in Table 14. Likewise, the same general criteria can be used in analyzing Table 15 as were used for examination of Table 14.

It can be observed that the farmer class outranked all other owner classes in every species category used excepting that of softwood pulp species. The recreation group class was the leader in the latter species group. In terms of the ratio of softwoods to hardwoods, the recreation group class was the leader. By the same criterion, the forest industry class ranked second highest, while the farmer class ranked lowest. Several other classes had softwood-hardwood ratios which showed they did not rate much above the farmer class.

TABLE 15

SAW-LOG TIMBER VOLUME^a BY SPECIES GROUP AND
OWNER OCCUPATION CLASS

Occupation Class	Softwoods		Hardwoods	
	Pulp Species ^b	Other Species	Aspen	Other Species
(million board feet) ^c				
Forest industry	12	13	6	42
Nonforest industry	11	21	15	64
Farmer	55	101	67	695
Part-time farmer	16	19	23	214
Business or professional . .	33	65	49	229
Wage earner	24	30	37	284
Housewife or widow	18	22	19	182
Recreation group	57	58	37	177
Real estate	21	52	38	147
Undivided estate	9	17	8	91
Retired	7	11	8	86
Total	263	409	307	2,211

^aIncludes net merchantable volume in live saw-timber trees from stump to a minimum four-inch top inside bark.

^bPulp species included here are spruce, balsam fir, jack pine, and hemlock.

^cBoard feet by the International Log Rule 1/4-inch kerf.

Average Size of Holding and Number of Owners

As it was pointed out in the previous chapter in discussing computational methods, the weakest portion of this study statistically has to do with the estimates of average size of holding and numbers of owners. However, if readers keep this in mind, much can be learned in a relative way between owner classes from these figures. They are presented in Table 16.

Nonforest industries own the largest average-sized forest holding. Forest industries, recreation groups, real estate people, and undivided estate holdings would all have to be considered large in terms of average size of holding. On the other hand, farmers, part-time farmers, and wage earners would have to be classed as small owners in terms of average size of holding. The reader should remember that average size of holding refers to total forest holding in the study area, and the holding may not necessarily be contiguous.

Comparatively speaking, the results on average size of holdings agree with the findings of other forest ownership studies. For example, Barraclough¹ found in New England that the forest owner

¹ Solon Barraclough. Op. cit., p. 178.

TABLE 16

AVERAGE SIZE OF FOREST HOLDING AND NUMBER OF
OWNERS BY OCCUPATION CLASS OF OWNER^a

Occupation Class	Average Size (in acres)	Number of Owners
Forest industry	1,115	97
Nonforest industry	20,192 ^b	12
Farmer	112	9,360
Part-time farmer	139	3,072
Business-professional	635	1,157
Wage earner	67	8,003
Housewife-widow	242	1,531
Recreation group	2,016	318
Real estate	1,254	352
Undivided estate	1,097	147
Retired	262	745
Average	1,177 ^c	
Total		24,794

^a Because of the way in which the Forest Survey sample was drawn, it is likely that there is a bias in favor of larger owner-ships. Hence, the numbers and averages shown in this table should be considered for comparative purposes rather than indicative of absolute quantities. The estimates of average size are likely large, and those of number of owners small.

^b Eliminating the one largest ownership, this average would be 3,765 acres.

^c Eliminating the one largest ownership, this average would be 661 acres.

with the smallest average-sized forest holding was the laborer-clerical class (comparable to wage earner in this study), and the largest was the public utility class (included in nonforest industry in this study).

In terms of numbers of owners, the farmer class was the leader, closely followed by the wage earner class. There were very few industrial owners of either the forest or nonforest variety. Five classes--farmer, part-time farmer, business-professional, wage earner, and housewife-widow--accounted for over 93 percent of the forest owners. But these same classes accounted for less than 64 percent of the forest area.

The presentation in Table 16 on numbers of owners also ranks the occupational classes quite similarly with Barraclough's¹ findings in New England.

The weakness of the estimates of number of owners and the bias in favor of large owners as shown in Table 16 is evident when compared with published statistics. The Census Bureau² estimated that there were 22,741 farms located in the study area which had

¹Loc. cit.

²U.S. Bureau of the Census. Op. cit.

some woodland. Table 16 indicates that there were only 12,432 farmers who owned forestland in the thirty-one-county area.

This disparity has two explanations. One is that farms tend to be more numerous than farmers. The other is that the sampling procedures employed favored large owners. The explanation for this bias was treated previously and hence is not repeated here.

CHAPTER V

SOME BACKGROUND INFORMATION ABOUT FOREST OWNERS

In this chapter there are discussed some generalizations concerning forest owners as a whole. There is also some treatment of these factors along the lines of occupational groups. The question of how these factors may affect actual forest management is dealt with in the next chapter. Nevertheless, by the inclusion of these points it is assumed that they may have some bearing upon the relation of forest owner to forest resource.

In the previous chapter it was clearly demonstrated that forest owners are, indeed, a heterogeneous group with respect to their occupational pursuits or interests, and their places of residence. The classifications of owners mentioned in this chapter possibly could be as important as occupation class in explaining divergent attitudes on the part of forest owners. However, as a method of classification of all owners, none of these, such as length of tenure or method of acquisition, would be as convenient and easily applied as occupation class.

The reader is cautioned at this point to remember that the classifications made in this chapter were on the basis of field

interview, while those in the previous chapter were on the basis of the much larger sample covered by the mail questionnaire to township officials. Also, due to the close tie with the forest survey it was possible to get a land and timber inventory by occupation groups which was not possible for the classifications treated in this chapter.

From the data presented in this chapter it may have been possible to develop intercorrelations between such variables as owner's age, method of land acquisition, length of tenure, and objectives of management. However, it was felt that such an exercise, although interesting, would have added more in length than practical value to the study.

Methods of Forestland Acquisition

It is often argued that the way in which an individual acquires land will bear a strong relation to his concern over that right of ownership. Undoubtedly there is considerable truth in this logic. However, method of land acquisition is so confounded with other variables such as objective of ownership, occupational interests, et cetera, that its influence is very difficult to isolate and evaluate. This is particularly true in a study of forestland because of the problem of measuring effect on the forest. An analysis making

possible the separation of all of these variables would require a very large sample, much larger than the one used in this study.

In Chapter II the concept of land as property was discussed at some length. Land is looked upon more as a commodity capable of being easily transferred from owner to owner here in America than anywhere in the world. Certainly, this has been an important factor in resource conservation in the United States.

Purchase. In the study area it was found that 85 percent of the owners who held 73 percent of the forestland obtained title to their land by purchase (Table 17). This, along with length of tenure, seems to substantiate the contention that forestland is very much of a marketable commodity in this part of Michigan.

Unfortunately, in this study, reason for purchase and purchase price were not determined. From other information and from opinions gained by conversation with forest owners something can be said about these reasons and values. Economic theory tells us that a rational man will purchase land and pay up to the discounted present worth of all future returns he expects from it. The application of this theory to explain group behavior is complicated by the fact that individuals differ with regard to their rate of time preference (discount rate they demand) and the value they place on

TABLE 17
METHODS BY WHICH OWNERS ACQUIRED TITLE
TO FORESTLAND

Method of Acquisition	Percent of Forest Area	Percent of Forest Owners
Purchase	73	85
Inheritance	27	15
Foreclosure	(a)	(a)
Gift	(a)	(a)
Total	100	100

^aLess than 0.5 percent.

the income (i.e., benefit or satisfaction) derived from land. This is particularly true in the case of forestland, since the benefits derived are many and cash incomes infrequent.

Inspection of Table 18 reveals that most of the land obtained by industry owners was through purchase. This is probably explained by the fact that most industries are corporate businesses. Most of the purchases by the timber industries were motivated by timber expectation values, either sustained yield or liquidation expectation. To other industry owners the timber was only incidental to other reasons such as to gain control of mineral rights.

Part-time farmers, recreation groups, and real estate people obtained 96 percent or more of their land by purchase. It seems safe to say that the latter two groups made their purchases for other than timber expectation returns. However, it seems equally safe to say that the values these latter groups are expecting are very much influenced by the presence of timber. Part-time farmers' acquisition of such a large portion of their holdings by purchase is likely a reflection of their efforts to obtain a place of residence and a supplemental income from farming.

Other methods. The only other important method of acquisition was by inheritance. Title to 27 percent of the forest area by

TABLE 18

METHODS BY WHICH OWNERS ACQUIRED TITLE TO
FORESTLAND BY OCCUPATION CLASS

Occupation Class	Method of Acquisition				Total
	Pur- chase	Inher- itance	Fore- closure	Gift	
(percent of forest area)					
Forest industry	89	11	0	0	100
Nonforest industry	99	0	1	0	100
Farmer	48	52	0	0	100
Part-time farmer	96	3	0	1	100
Business or professional	64	36	0	0	100
Wage earner	63	37	0	0	100
Housewife or widow	58	42	0	0	100
Recreation group	99	0	0	1	100
Real estate	98	1	0	1	100
Undivided estate ^a	92	8	0	0	100
Retired	85	15	0	0	100
Average	73	27	(b)	(b)	100

^a Figures here refer to the method of acquisition by the deceased owner. The undivided estate itself could not have been established by purchase, but only through inheritance.

^b Less than 0.5 percent.

15 percent of the owners was obtained through inheritance (Table 17). Foreclosure and gift as methods of gaining ownership to forestland accounted for a significantly small proportion of the owners and the acreage. No doubt there was some reluctance on the part of owners to admit acquisition had been attained by means other than purchase. Owners seemed rather reluctant to admit they had attained ownership by foreclosure. Owners who had bought out other heirs to attain full ownership always claimed to have purchased their land, and in the analysis such a method of acquisition was considered as being by purchase.

Some have argued that inheritance represents a type of accidental land acquisition and that land thusly acquired would not be as well cared for as that purchased for hard cash. Others have arrived at the opposite point of view, based on the assumption that inheritance is associated with stable family ownership and its supposed favorable influence on attitudes toward land. Little experimental evidence exists to prove either of these contentions.

Barracough¹ found that a lower proportion of owners who had acquired their lands by purchase were interested in timber production than was the case with those who acquired theirs by inheritance.

¹ Solon Barracough. Op. cit., p. 240.

His conclusion was that timber production as an objective of ownership (not necessarily meaning the best care) was often acquired by default rather than deliberate action.

A comparison of the proportions of owner numbers and forest area (Table 17) indicates that more large areas were transferred by inheritance than small areas. The reverse is the case with purchased forest ownership. This seems to indicate that the larger properties are tied in with a somewhat more stable family ownership, while purchasers of forestland usually bought smaller parcels.

Forest industries acquired very little of their land by inheritance except in the cases of small family-held business enterprises. Most of such cases observed in the study area were part-time sawmill operators.

Inheritance as a method of forestland acquisition was highest among farmers, and second highest among the housewife-widow group. One would expect that housewives and widows would acquire much of their land by inheritance. As a matter of fact, one might logically expect the proportion to be even larger. The fact that it is not larger may be explained by two reasons. One is that in some cases land bought by the family as an investment is carried in the wife's name and thus would be considered as purchased. The other reason is that land bought by the husband and held by the widow quite often

is considered by her as purchased land. In the interviews attempt was made to determine this, and land obtained by widows from deceased husbands was recorded as inherited land.

The large proportionate acreage of forestland farmers acquired by inheritance is somewhat surprising and not easily explained. The most logical explanation is that farm units, including both agricultural and forestland, were not a readily marketable commodity in this part of Michigan. In other words, the relatively inactive market for farm real estate causes inheritance to rank quite high as a means of farm transfer.

Only about 1 percent of the forest owners of 1 percent of the forestland obtained their land by gift and foreclosure combined (Table 17). Even considering the reluctance of owners interviewed to admit acquisition by gift or foreclosure as previously discussed, the proportion of forestland acquired by these means is significantly small. The small proportion of forestland transferred by foreclosure may indicate several things. One indication is that holding forestland is no longer the financial burden it once was, which, of course, is just another reflection of the high level of general economic activity that prevailed in 1953 and for several years prior to that date. Another implication is that few loans have been made on forestland, hence little possibility existed for foreclosure. This, indeed, has

been the case because banking regulations prior to 1953 kept federal banks from making loans backed by forestland. Other large lending agencies have stayed away from forest loans voluntarily. One large acreage which was obtained by foreclosure came about as a result of default of all financial obligations of the former owner, and hence the transfer of the forestland by this means was just incidental to the transfer of all other assets.

It seems quite evident that foreclosure is not a forestland tenure problem in the portion of Michigan covered by this study.

In the case of real estate transfer by gift, it is usually said to be just a matter of choice between inheritance and gift on the part of the person making the bequeath, the choice in this matter resting between the possibility of avoiding estate or inheritance taxes and actual charitable inclinations.

Length of Forestland Tenure

Stability of land tenure has been one of the major concerns of land economists in the United States for many years. Ely and Wehrwein¹ call instability one of the worst features associated with American land tenure. They deem it dangerous to community life

¹Richard T. Ely and George S. Wehrwein. Op. cit., p. 207.

and institutions, and contend it contributes to a lack of interest by the owner in the land. Often, the owner's only desire is to sell his land and realize any liquidation value possible from it.

Since the production of mature forest tree crops is a long-term enterprise, stability of tenure over time is important if any one owner is to expect returns from investments in forest cultural expenditures. In the case of many types of permanent improvements on the land, the owner can expect these improvements to be reflected in the selling price of the land even though he can seldom expect to recover their depreciated or replacement value. Investors in forest improvements seem to have little chance of having their expenditures recognized in the resale value of the property. It not only takes a long while to mature a tree, but it also takes a long while in terms of individual length of tenure for there to be visible evidence in the forest of improvement measures put forth on the tree crop. Further, when the effects of cultural work become visible in the forest, its discounted value with respect to future timber harvests is not appreciated. Thus it appears that short length of tenure may be more important in private forest ownership as a deterrent to investment than as a contributor to forest liquidation. This is much more likely to be the situation with regard to young second-growth forests like those of northern Michigan than to old virgin forests.

For all owner classes. In the study area 30 percent of the forestland possessed by 12 percent of the owners had been held more than twenty-five years, while 6 percent of the owners had owned 2 percent of the forestland less than two years (Table 19). Examination of these data seems to indicate that the large owners represented more stable ownership than the small owners. Barraclough¹ found approximately the same relation in his New England study between number of owners and forest area when related to length of tenure.

The analysis of the mail questionnaires sent to absentee owners did show some significant differences when compared with the data in Table 19. Some 44 percent of the absentee-owned forest area had been held over twenty-five years, as contrasted to 30 percent held that long by the owners interviewed. Absentee owners questioned by mail also had more land held less than two years than was the case with owners personally interviewed.

It is interesting to note that there is a distinct peak in the number of owners and percent of forest area columns, indicating that there was great activity in the forestland market during the period 1939 to 1945. This peak was also observed in the analysis

¹ Solon Barraclough. Op. cit., p. 198.

TABLE 19
LENGTH OF TENURE

Length of Tenure (in years)	Percent of Forest Area	Percent of Forest Owners
One to two	2	6
Three to four	8	7
Five to six	11	4
Seven to eight	4	12
Nine to ten	13	31
Eleven to fifteen	12	21
Sixteen to twenty	9	4
Twenty-one to twenty-five	11	3
Twenty-six and up	30	12
Total	100	100

of the mail questionnaires, but occurred more sharply about 1944 to 1945. Again, it is significant to note that Barraclough's¹ work in New England noted a peak of forestland acquisition during the same period. This is probably due to a lack of other investment activity during the war years and the desire to obtain land for recreational purposes. Also, it is likely the result of the "back-to-the-job" movement from rural lands to the cities which was a result of increased economic activity associated with the war. There had been such an exodus from industrial to rural areas during the depths of the depression that land was sometimes called "the heritage of the underprivileged." It is doubtful if much of this peak could be explained by the anticipation of high land values following World War II. It certainly can not be explained by a land acquisition policy on the part of any private corporation or large individual owner.

By occupation classes. A study of Table 20, which shows length of tenure by occupation class, reveals some interesting points. The forest industry group has held about three-fifths of its land less than six years, while the nonforest industry group has held 96 percent of their forest holdings over twenty-five years. This would

¹Loc. cit.

TABLE 20

LENGTH OF TENURE BY OCCUPATION CLASS OF OWNER

Occupation Class	Length of Tenure in Years				Total
	1-6	7-15	16-25	26-up	
(percent of forest area)					
Forest industry	59	14	17	10	100
Nonforest industry	0	3	1	96	100
Farmer	23	26	19	32	100
Part-time farmer	19	54	24	3	100
Business or professional	14	35	12	39	100
Wage earner	28	33	21	18	100
Housewife or widow	16	46	28	10	100
Recreation group	23	12	21	44	100
Real estate	33	26	28	13	100
Undivided estate	1	7	(a)	92	100
Retired	15	33	43	9	100

^a Less than 0.5 percent.

seem to indicate the forest industry group has been expanding its holdings in the area recently. A more detailed analysis of the questionnaires showed that most of this peak of land acquisition could be attributed to the pulp company group, but a similar peak was noted in the lumber company group.

At this juncture it should be mentioned that the industry holdings usually represent corporate ownership and thus have drastically different institutional problems in this matter of length of tenure than one finds with individual ownership. Theoretically corporations can live forever and thus can have longer planning horizons than individuals. A large-scale industry acquisition program could mean improved forest management on an increasingly larger area.

Among the nonindustrial groups, farmers, business-professional people, recreation groups, retired people, and undivided estates have all held more than one-half of their forestland for more than fifteen years. The recreation group, with 23 percent of its forestland held less than six years and 44 percent over twenty-five years, indicates two distinct periods of acquisition activity by this group. A similar pattern was shown by an analysis of the mail questionnaires returned by recreational groups. A great deal of large acreage was acquired by hunting clubs during the twenties when large tracts could be had

for payment of the delinquent taxes, or less, if purchased directly from the state.

In the wage earner group there was a significant difference between results of the absentee owners who replied by mail and those interviewed in the field. The former had held only 17 percent of their forestland over fifteen years, while those wage earners personally interviewed had held 39 percent of their forestland over fifteen years.

There was a similar contrast between the same two groups within the business-professional class. Large purchases since World War II by urban dwellers from large distant cities for recreational purposes is part of the explanation for this situation. However, a sizable share of the large proportion of land in the business-professional and wage earner groups (Table 20) held for more than seven years but less than fifteen years¹ seems to be the residual holdings of those involved in the rural-to-urban movement which took place as economic activity increased just prior to World War II and during the early years of the war.

¹ Analysis of the mail questionnaires showed similar results, with 57 percent of the business-professional forestland and 46 percent of the wage-earner-owned forestland having been held from seven to ten years.

Close to one-half of all forestland owned by the housewife-widow group had been held from seven to fifteen years. This peak may be associated with the average life expectancy of wives over husbands.

The large proportion of undivided estate holdings having been in that group for more than twenty-five years is difficult to explain. It would seem to indicate that estates are either quickly settled after the death of the former owner or a settlement can not be reached at all during the life of the direct heirs.

Family Ties to the Forestland

Land economists who have studied obstacles to good conservation practices on private lands usually consider instability of ownership an important factor. This was just pointed out under the section on length of tenure. It was not discussed, however, how instability of ownership within the family from generation to generation may affect owners' attitudes toward forestland.

In America there has been little concern over maintaining a parcel of land intact from generation to generation. In some countries of western Europe¹ measures were developed to keep land

¹ Particularly, this was the case in Germany, which has been noted for her good forestry practices. England, noted for poor

units in the family from one generation to the next. One system that has been used frequently is called "primogeniture," which usually assured that the property would go to the eldest son. Another system was that called "entail," which made it possible for an owner to designate the line of inheritance for several generations into the future. These systems, coupled with a very high respect for land and forest, seem to have resulted in an entirely different attitude toward forestland than has prevailed in this country.

Under stable family ownership as observed in western Europe it seemed that a son who knew a farm woodland would one day be his took considerable interest in caring for it. Likewise, the father, who realized the land had been his father's before him and would be his son's after him, was prone to take great pride in his farm woodland. This has, where it has been practiced, resulted in a lowering of the individual owner's rate of time preference and has extended his planning horizon beyond his own span of life.

Neither entail nor primogeniture are legal processes in the United States. However, it is known that some forestland has been in one family ownership for more than one generation, and it is

forestry, developed the system of free transfer and later passed the system on to the American Colonies.

also known some owners intend that it will remain with the family still another generation.

In this study questions were asked family property owners to determine how long the forestland had been held by that particular family. The analysis of this question in terms of the number of generations the property had been in that family's ownership prior to the present is presented in the following tabulation:

<u>Number of Generations</u>	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
0	59	85
1	32	13
2	<u>9</u>	<u>2</u>
Total	100	100

These data clearly indicate that stability of tenure of forestland from generation to generation was the exception in the study area. The data also indicate that stability of ownership in this fashion was greater in large ownerships than in small ones.

As was pointed out in an earlier section of this chapter, an individual's decisions with respect to investments or improvements in land are based largely upon his expectation of the future. If he has no hope of return from an investment in conservation during his life expectancy, chances are he will not make the investment.

However, if he could foresee that his son might realize the returns the investment would be more likely to be made.

Owners of forestland which was considered as being in family ownership were asked for an expression of their expectations or plans of retaining the forestland in their family ownership another generation.

The analysis of that question is presented in the following tabulation:

	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
Expect to continue ownership another generation	30	53
Do not expect to continue ownership another generation	<u>70</u>	<u>47</u>
Total	100	100

A surprisingly large number of owners (53 percent owning 30 percent of the forestland) indicated that they expected to pass their forestland ownership to another generation in their family. Small owners had these plans more often than large owners.

The comparison of owners' expectations with the inheritance history would seem to indicate that owners now have more definite plans for continuing family ownership or such plans seldom actually materialize. Since large owners had less expectation of continued

ownership but a better record of attainment on that score, it would seem that the intentions of many of the small owners were overly optimistic and those of large owners more realistic.

Age of Forest Owners

Students of the economics of conservation are generally of the opinion that as an owner's age increases and his life expectancy decreases he becomes less interested in making long-term investments. The presence of this type of feeling has been noted among older land owners in other studies. Also, it should be recalled that under the American economic and social system outright ownership of landed property is seldom achieved until a man reaches his forties. The combination of this attitude and this institution seems to create a climate that is quite unsatisfactory from the standpoint of promoting long-term land enterprises like forestry.

In this study individual owners interviewed were asked their age or their age was estimated when a direct question did not seem advisable. The analysis of the results of this question is presented in Table 21.

Examination of Table 21 reveals that more owners were in their forties than any other ten-year age bracket. However, owners over fifty owned the greatest proportion of forestland. This is as

TABLE 21
AGE OF FOREST OWNERS

Age of Owner	Percent of Forest Area	Percent of Forest Owners
Under thirty	11	3
Thirty-one to forty	7	23
Forty-one to fifty	26	35
Fifty-one to sixty	27	18
Over sixty	29	21
Total	100	100

one might expect, since generally one's economic position improves with age. Older owners could be expected to afford to own larger tracts on the average than younger owners.

These results are quite comparable with those obtained by Barraclough¹ in New England, with the exception that he found the acreage peak as well as that for the number of owners fell in the group in their fifties. Barraclough compared owner's age by occupation grouping and found that the only group with the majority of owners and the acreage they held to be over sixty years of age was the retired group. Most of the acreage held by housewives also was held by women past sixty years of age. The peak of all other groups with respect to acreage and numbers fell in the fifty to fifty-nine year age bracket.

The influence age may have on management is discussed in the following chapter.

Objectives of Forest Ownership

In order to understand forest owners and the attitudes they take toward their forest holdings it is necessary to consider their objectives of management or ownership. In an earlier chapter it

¹Solon Barraclough. Op. cit., p. 186.

was pointed out that owners varied with respect to their objectives of management; i.e., that all owners in a given occupation did not have the same reasons for owning forestland. In this section objectives of management are explored in more detail.

In this section further and more detailed consideration is given to the forces beyond pure economic incentives which motivate forest owners. It could be argued that this requires psychologic rather than economic analysis. Admittedly, there is considerable truth in this argument and the writer is of the opinion that forestry might gain much from a psychological type study. The approach used here, however, is along the lines used in consumer preference type surveys and as such definitely belongs in the area of economics.

It might be stated that the major hypothesis of this section is that forestland as a producer's good has been superseded by forestland as a consumer's good, or that forestland has become a producer's good held for its yield of certain intangibles. Most observers would admit that to a certain extent this hypothesis is true; i.e., that for a certain portion of forestland and forest owners it is true. Examination of these portions is the objective of this section.

Objectives of all owner classes. An examination of Table 22 indicates that over one-third of the forest owners (owning nearly

TABLE 22
OBJECTIVES OF MANAGEMENT

Objectives of Management	Percent of Forest Area	Percent of Forest Owners
Farm usage; including home use, timber sale, and pasture	31	37
Growing timber for sale	4	4
Production for owner's wood- using plant	2	(a)
Investment or speculation	18	4
Sale of mature timber	7	(a)
Sale of mineral or mineral rights	(a)	(a)
Clear for agriculture	3	6
Recreation or residence	19	39
Inactive ^b	8	9
Other ^c	8	1
Total	100	100

^a Less than 0.5 percent.

^b Inactive is used to indicate management without a specific purpose sufficiently well defined to place in a particular category.

^c Other is used to indicate some miscellaneous but specific objective not listed separately above.

one-third of the forest) were holding their timberlands for farm-use purposes. The analysis of the mail questionnaire sent to absentee owners, however, revealed that only 4 percent of the forest area they owned was held for farm-use purposes. This disparity is attributable largely to the fact that there were no farmers or part-time farmers among the respondents to the mail questionnaire.

More forest owners (39 percent) were interested in their forest property for recreational or residence purposes than for any other reason. These owners, however, accounted for less than one-fifth of the total forest area. The absentee owners responding to the mail questionnaire indicated that they were holding over half of their forest area for recreational purposes.

Investment or speculation as an objective of management was given as the reason for ownership of the third largest area of the forestland classified according to objective of management. The analysis of the mail questionnaire revealed that absentee owners were holding almost an identical portion (18 percent) of their land for the same purpose.

A comparison of the two columns in Table 22 indicates that forest properties held for farm use and recreation tended on the average to be smaller than those held for investment or speculation purposes.

Few observers should be surprised by the high rank of farm use as an objective of ownership. The high proportion of forestland held for recreational or residence purposes is more significant. Recreation is not only an important objective in itself, but probably also accounts for a large share of the speculation in forestland. No deliberate attempt was made in the study to determine the reasons forestland was being held for speculation purposes. However, it is safe to assume that well over half of the land held for speculation was being held in anticipation of its future recreational value.

Objectives by occupation classes. A comparison of objectives of management or ownership within occupation groups may serve as an indicator of how satisfactory a simple system of occupation classification is in explaining owners' objectives of management. An examination of Table 23 will reveal that there is not a great dispersion of objectives in some of the occupation classes. For example, 95 percent of the forest area owned by real estate people was being held for speculative purposes, and all of the land owned by the recreation groups was being held for recreational or residence purposes. Most other occupation groups exhibited less uniformity of objectives. It is logical that the business-professional group, the wage earner group, and the housewife-widow group would have quite a dispersion of objectives of ownership.

TABLE 23
OBJECTIVES OF MANAGEMENT BY OCCUPATION
CLASS OF OWNER

Objective of Management	Forest Industry	Non- forest Industry	Farmer	Part- time Farmer
(percent of forest area)				
Farm usage, including: home use, timber sale, and pasture	0	0	89	62
Growing timber for sale . .	6	0	0	6
Production for owner's wood-using plant	75	0	0	0
Investment or speculation . .	8	0	0	9
Sale of mature timber	3	0	0	0
Sale of mineral or mineral rights	0	5	0	0
Clear for agriculture	0	0	11	8
Recreation or residence . .	2	0	0	0
Inactive ^a	0	1	0	15
Others ^b	6	94	0	0
Total	100	100	100	100

^aInactive is used to indicate management without a specific purpose sufficiently well defined to place in a particular category.

^bOther is used to indicate some miscellaneous but specific objective not listed separately above.

TABLE 23 (Continued)

Business or Pro- fessional	Wage Earner	House- wife or Widow	Recrea- tional Groups	Real Estate	Undi- vided Estate	Retired
(percent of forest area)						
13	22	15	0	0	2	11
12	13	0	0	5	0	0
0	0	0	0	0	0	0
9	8	17	0	95	91	37
34	0	22	0	0	0	0
0	0	1	0	0	0	0
0	1	0	0	0	0	0
22	26	1	100	0	0	3
5	26	21	0	0	1	49
5	4	23	0	0	6	0
100	100	100	100	100	100	100

It is significant that more forestland within the business-professional group and the housewife-widow group was being held for sale of mature timber than for any other purpose. In other words, the value of the timber on the land in terms of some expected return from it (not in terms of sustained yield forestry) was the most important reason for these groups owning forestland.

It is somewhat surprising when one recalls the high rank of the recreation objective of management that this was the leading objective in only one occupation group even though about one-fourth of the forestland owned by wage earners and business-professional people was held for recreation purposes. It is also significant that almost one-tenth of the forestland in each individual owner occupation group with the exception of farmers was being held for speculation or investment.

It is to be expected that farm usage would rank as the highest ownership objective among farmers and part-time farmers and that production for owner's wood-using plant would rank highest among the forest industries. The large proportion of area (94 percent) listed under other objectives within the nonforest industry groups is being held largely for watershed protection purposes by public utility companies.

The broad implications of objectives of forest ownership can be well summarized by quoting from Barraclough¹ as follows:

The heart of the problem of managing the land in small forest holdings at optimum intensity is not merely the application of inputs of labor and capital to this land so as to maximize net financial returns. For if the owners hold this land for other values besides the production of forest products, then any rational process of maximization must take these other values into consideration. Unless we are to indulge in value judgements of a most obvious type, then, speaking as economists, we have no right to maintain that some theoretical social welfare function that we are presumably seeking to maximize will be best served by maximizing the net productivity of forest products from this land if it means the sacrifice of other values by the present owners without adequate compensation; and it may be that the intangible values of ownership are such that adequate compensation to the present owners for sacrificing them would be beyond all reason from a social point of view.

In other words, Barraclough is saying that present private forest owners may be maximizing their satisfaction of owning forestland by the production of values other than those expected from the sale of forest products. And further, that to maximize production of forest products from these lands within the framework of private ownership of land with equality and justice for all, such large compensation may be required for private owners from society as to render any change in objective of management virtually impossible.

¹Ibid., p. 231.

CHAPTER VI

SOME ASPECTS OF FOREST MANAGEMENT

This chapter treats several different aspects of forest management and considers how they may be influenced by certain factors of ownership. In the previous chapter several broad characteristics of forest ownership were discussed, but not directly related to the handling of the forest. In this chapter many of those characteristics and several additional ones are related to how owners actually treat their forest stands. The basis for most of these valuations was an on-the-ground inspection of the way forests had been harvested.

In an earlier section (Chapter IV) some light was shed on this question by observing timber volumes and acreages of various forest types held by different classes of owners. Here the approach employed goes beyond inventory comparisons because timber inventories do not reflect what is actually being done now with the property. Inventory alone has the disadvantage of being more of a reflection of previous owners' management than present owners' actions. Present forest management can be better evaluated by considering the control owners exert over operations associated with the handling of the forest.

The analysis presented in this chapter is predicated upon the assumption that good forestry practices constitute those which will tend to maximize the production of timber crops in the long run. As previously discussed, however, maximization of timber products' income and maximization of net satisfaction from owning forestland are not necessarily coincident.

Agent in Charge of Forest Management

In land management evaluations it is usually considered that the owner will do a better job handling his own land than anyone else, and that a tenant (particularly in agriculture) will do the poorest management job. This is not necessarily the case in forest management; in fact, the contrary may be true. Often forestland cared for by a manager, particularly if the manager is a professional forester, receives better treatment than it would from the owner.

In the study area it was found that 80 percent of the forest area was handled directly by the forest owners, 19 percent by managers, and only 1 percent by tenants. In many cases this large proportion overseen directly by the owners was visited only occasionally by them. Many of the owners who attempted to look after their own forestland lived too far from the property to effectively administer it despite their good intentions.

No effort was made to separate further the 19 percent of forest area in charge of a manager to determine that portion managed by a professional forester. It seems safe to assume, however, that a very small part was in charge of professional foresters, most of this being accounted for by a few large ownerships. Very often the nonprofessional forest managers were resident caretakers whose job was to supervise the holdings in general.

The small portion of forest area controlled by tenants rather than owners indicates that this arrangement offers no serious obstacle to good forest practices in northern Michigan. Tenants often resided on forest tracts, and farm tenants often had sizable woodlands on their farms. The sum of such forest areas would likely exceed the 1 percent of total forest area shown in Table 24 as tenant-controlled. However, only a small fraction of the tenancy situations included timber rights, thus accounting for this low figure (1 percent). This may be taken as some evidence that owners considered their woodlands to be valuable enough to retain their control for themselves.

In Table 24, agent in charge of forest management is compared for different owner occupation classes. These data indicate that forest property owned by individuals such as farmers, wage earners, housewife-widows, and retired persons was usually handled

TABLE 24

AGENT IN CHARGE OF FOREST MANAGEMENT
BY OCCUPATION CLASS OF OWNER

Occupation Class	Agent in Charge of Forest Management			Total
	Owner	Manager	Tenant	
(percent of forest area)				
Lumber company	100	0	0	100
Pulp company	0	100	0	100
Part-time sawmill operator	100	0	0	100
Other forest industry .	100	0	0	100
Nonforest industry . . .	4	94	2	100
Farmer	100	0	0	100
Part-time farmer	100	0	0	100
Business or professional	64	36	0	100
Wage earner	94	1	5	100
Housewife or widow . .	99	1	0	100
Recreation groups	55	45	0	100
Real estate	95	5	0	100
Undivided estate	9	91	0	100
Retired	86	14	0	100
Average	80	19	1	100

directly by them. Corporate or group owners such as pulp companies, nonforest industries, and recreation groups quite often delegate managerial responsibility.

The business-professional group with 36 percent of their forest holdings controlled by a manager was the only individual owner group to delegate such a large share of managerial responsibility. This could be taken as an indication that members of this group, enlightened in the ways of business administration, realized their own inability to give their forestland proper care. Also, of course, it could mean that this was the only individual owner class able to afford such a luxury.

The lumber company, part-time sawmill operator, other forest industry, and dealer in forest products groups with all of their lands owner-managed stand in sharp contrast with the pulp company management situation. This situation is probably as much attributable to size of ownership as to anything associated with the interests of the owner. Pulp company ownerships tend to be large, with actual company ownership divided among many stockholders, thus making an employee manager a necessity. The other forest industry groups are made up of small ownerships which do not offer a physical handicap for management by owners, particularly since

their day-to-day job often takes them to some forestlands near their property.

The 5 percent of forestland whose management was delegated by the wage earner group to tenants represented about three-fourths of all of the forest management turned over to tenants. As observed in the field, this seems to indicate two things: first, a high degree of sheer neglect by these owners; and second, the need to keep some family relative as a happy tenant.

Grazing of Forest Areas

Some light can be shed on how well the forests of the study area are managed for timber production by considering how much of the forest area is grazed. The evaluations expressed in this section are based upon the findings of several studies in similar forest types which have found grazing and timber production to be competitive enterprises which can not be profitable combined. Extension personnel and other public disseminators of technical forestry information, as well as private forestry consultants in the region, have persistently recommended that the two enterprises (forestry and grazing) never be combined on the same area.

In this study it was found that 55 percent of the forest area had no grazing by domestic livestock whatsoever, that 13 percent

of the area was totally and rather consistently grazed, while the balance (32 percent) of the forestland was owned by persons who grazed only a portion of their holdings or grazed their woods only intermittently. These data would seem to indicate that forest grazing was not as serious a problem in the region as it was often thought to be.

A striking contrast was noted between the results just cited above and the results of the same analysis applied to the mail questionnaire which was sent to the absentee owner group. Those owners responding by mail indicated that 90 percent of their forest holdings had positively no grazing, while the remaining 10 percent was only partially grazed. Most of the disparity between the two groups of owners is due to the fact that the latter group contained no farmers or part-time farmers. Naturally, the two farmer classes would be more guilty of grazing than all other groups since they were usually the only groups to own any livestock. This also offers an explanation for the opinion among extension personnel and similar groups that grazing is a serious problem. The extent of this problem was brought out also by the Census of Agriculture,¹ which

¹U.S. Bureau of the Census. Op. cit.

reported that 926,696 acres, or 62 percent of the farm woodland acreage in the study area, was pastured in 1949.¹

Frequency of Forest Harvests

It is often argued by forest economists that one of the most important reasons for a lack of interest in the production of forest crops by private owners is due to the fact that they seldom obtain an income from the harvest of forest products. In this study no direct question was asked forest owners as to the income they had received by selling timber because it was felt that an income type question would only serve to antagonize the interviewees. It was felt that this obstacle could be overcome and a similar objective accomplished by asking owners when the most recent commercial timber cut had been made in their ownership. The analysis of the response to this question is presented in Table 25.

Only cuts considered as commercial were included in this analysis, since harvestings of this type are the only ones which

¹ The Census Bureau's definition of a grazed woodland did not coincide sufficiently with the one employed in this study to establish a reliable check. The Census Bureau recorded actual forest acreage pastured on each farm. In this study if any part of an owner's forest was grazed his total forest acreage was listed as grazed or partially grazed, whichever he indicated.

TABLE 25

YEAR OF MOST RECENT CUTTING IN PRESENT OWNERSHIP

Most Recent Cutting	Percent of Forest Area
No cutting in this ownership	47
Cutting prior to 1940	(a)
Cutting during the period 1940-44	3
Cutting during the period 1945-49	2
Cutting during the period 1950-54	48
Total	100

^a Less than 0.5 percent.

represent cash income to the owner. Small home-use cuts for such things as fence posts are important to the farmer groups, but their inclusion would have given a false picture to the total situation, hence they were omitted.

It is significant that owners of 47 percent of the forest area had made no commercial timber cut during their ownership. Recollection of the findings on length of tenure (Table 19) which showed that half of the forest area had been held for sixteen years or more only serves to make the above 47 percent appear more significant.

The indication that owners of 48 percent of the forestland had made some commercial cut during the 1950 to 1954 period may give somewhat of a false picture of the situation. A large share of the 48 percent figure is attributable to the inclusion of the total forest acreage of several large owners who made commercial cuts on only a fraction of their forestland. Even making allowances for this type of distortion, the large proportion of forest area in ownerships with some cutting has several implications. One explanation for the surge in cutting activity in the most recent five-year period is due to a bettering of the marketing situation as a whole, particularly for aspen pulpwood. Another explanation is that owners who only recently acquired their land have done considerable cutting, largely as a means of defraying at least part of the purchase price

of the property. This philosophy of making the timber help pay the purchase price is particularly evident among speculative owners.

It is extraordinary that the analysis of the mail questionnaires from absentee owners showed almost identical results with those shown in Table 25. Among this group, owners of 50 percent of the area had made no commercial cut, while owners of 47 percent of the area had made a cut in the last five-year period.

It is convenient for analysis to consider forest owners in these two groups separately. One group has little interest in the forest as a producer of timber. At present timber prices and at current physical productivity levels of the forest other interests are paramount with this group; i.e., the aesthetic value of the forest as a consumer's good usually outweighs any return they could get from a timber sale which might, in fact, impair its worth as a consumer's good. Many owners remarked when being interviewed that they positively would not consider making a timber sale because of the risk of damaging the beauty of the forest. Several of this group who refused to consider a timber sale were real estate people, which leads to the conclusion that the aesthetic value of the forest does, indeed, have a cash value. It was noted, however, that many owners who staunchly refused to consider a timber sale were persons with adequate incomes from other sources.

The other group of forest owners who had made recent timber sales and who also tended to make frequent sales were much more optimistic. Invariably, these frequent sellers, aside from the few large owners referred to earlier in this section, appeared to belong to the lower-income category, or they were persons trying to snowball a shoestring into a fortune. These were all people who could not resist the temptation of a quick cash return.

The above analysis, though convenient, may represent an oversimplification of the situation. Certainly, the relatively inactive timber market in the northern portion of Michigan's Lower Peninsula has offered little inducement for many owners to make timber sales, and hence there may not have been a true test of their attitudes. In the study area only 8 percent of the privately owned forest area was in stands classifiable as saw timber (see Table 9). This obviously was not an adequate resource base for supporting the type of forest industries which would compete for private timber actively enough to tempt all owners.

Administration of Forest Harvests

Aside from on-the-ground visits to recently cut-over areas, which is very difficult in the case of absentee owners, the next best way of evaluating actual management is to consider the way in which

owners supervise harvests and apply forestry techniques commonly associated with good timber sales procedure. When such a method of evaluation is used, however, care must be taken that the owner does not realize the objective of the questioning; otherwise he may attempt to mislead the interviewer in order to hide a record of poor management.

In addition to visiting actual cutting operations when possible, the method described above was employed in this study. The portions of this section which follow describe these methods and the findings thereof.

Supervision. As shown in Table 26, a very small portion (12 percent) of the forest area was in the ownership of persons who employed a professional forester to supervise the cutting. On the other hand, owners of about three-fourths of the forest area claimed that cutting on their property had been supervised either by themselves or their representative.

In this study no attempt was made to establish the correlation between type of supervision and actual cutting practice. Such a correlation, however, has been assumed in this discussion and demonstrated in other studies.¹ The assumption is that the

¹ Lee M James, Wm. P. Hoffman, and Monty A. Payne. Op. cit., p. 16.

TABLE 26

OWNERS' CONTROL OF TIMBER CUTTING

Control Exercised	Percent of Forest Area ^a
Cutting supervised by professional forester	12
Cutting supervised by owner or his representative ^b	74
Trees marked for cutting	14
Diameter limit specified	27
Merchantable trees left standing ^c	29

^aPercent of forest area expressed in terms of total private forest area on which some cutting under present ownership was reported.

^bIncludes the 12 percent which was supervised by a professional forester representative.

^cClassified according to intention of owner, whether executed on the ground or not.

higher the degree of supervision the higher the order of timber management.

The analysis of the mail questionnaires from the absentee owners not interviewed showed a similar trend with respect to the answers to these two questions on supervision. However, the absentee owners who answered these questions by mail indicated a little higher portion of their land had received the types of supervision indicated above than was the case with persons interviewed personally. This disparity between the owners interviewed by the two different means may have been due to the ability of persons with access to the entire questionnaire (the mail respondents) to anticipate the objectives of the questions.

The analysis of the questions on supervision according to the occupation of the owner is presented in Table 27. The first column of this table indicates that most of the forest area where cutting was supervised by a professional was accounted for by the industry groups. Most of the 36 percent of forest area professionally supervised and owned by the forest industry group was accounted for by a few large owners, mostly pulp company owners. The good record attained by the nonforest industry group is also due to the high caliber of management practiced by a very small number of firms. Those firms in the nonforest industry group who did have professional

TABLE 27
CONTROL OF TIMBER CUTTING BY
OWNERS' OCCUPATION CLASS

Occupation Class	Control Exercised				Mer- chant- able Trees Left Stand- ing ^b
	Cutting Super- vised by a Profes- sional Forester	Cutting Super- vised by Owner or His Repre- sentative ^a	Trees Marked for Cutting	Diameter Limit Specified	
	(percent of forest area) ^c				
Forest industry . .	36	82	43	54	42
Nonforest industry	100	100	100	100	-
Farmer	0	87	0	0	57
Part-time farmer	0	44	9	2	26
Business or professional . .	3	80	13	58	-
Wage earner . . .	0	70	0	47	74
Housewife or widow	3	84	3	0	36
Recreation group .	11	55	2	0	25
Real estate	0	50	0	0	17
Undivided estate .	0	1	0	98	-
Retired	0	9	8	0	9

^aIncludes that which was supervised by a professional forester representative.

^bClassified according to intention of owner, whether executed on the ground or not.

^cPercent of forest area expressed in terms of the total forest area within occupation classes on which some cutting under present ownership was reported.

foresters in their employment claimed that they had never made a commercial timber cutting during their period of ownership.

The recreation group was the only other occupation class making use of professional foresters' services to any appreciable extent. The acreage classed in this category was generally in large ownerships, and professional services were secured by working agreements with organized firms of consulting foresters.

The high proportion of area owned by farmers which received cutting supervision was due mainly to farmers being resident owners and hence able to personally oversee their property. In like fashion most of the 44 percent of part-time farmer-owned forest area and the 70 percent of wage-earner-owned forest area receiving some sort of cutting supervision is the result of personal supervision.

Business-professional people, the housewife-widow group, recreation groups, and real estate people frequently hired the services of a caretaker to supervise cutting from their property. No effort was made to try to evaluate this type of service. Undoubtedly, some of it was of high quality, but much of it was not as good as the owners thought it to be. It is interesting to note that frequently when owners were quizzed as to the professional qualifications of their representative they became rather indignant and expressed the

belief that their nonprofessional representative was just as qualified as any professional forester.

Undivided estates and retired people were extremely lax in seeing that cutting on their forest areas had any type of supervision whatsoever.

Other restrictions on cutting. Two other restrictions sometimes placed on commercial timber operators by the owners to insure some bare minimum application of good forest practices are by the marking of trees for cutting or the specification of a minimum diameter limit on trees to be cut. Table 26 indicates that only 14 percent of the forestland was held by owners who marked trees to be cut when they sold timber. Only 27 percent of the forestland was held by owners who went to the trouble to specify a minimum diameter limit. This latter means represents just about the least effort an owner can make to insure some minimum forest practices. It might be added that care was taken in asking this question to make sure that the diameter limit was the owner's specification rather than a minimum economic limit set by the logger.

The analysis of the mail questionnaires from the absentee owners concerning the questions on marking trees for cutting and a minimum diameter limit yielded results almost exactly opposite

those presented in Table 26. No explanation can be offered for this disparity beyond the possibility that these owners, having full access to all of the questions, could have anticipated their objective and hence gave misleading answers.

Examination of Table 27, in which is presented the analysis by occupation classes of the questions on tree marking and diameter specifications, reveals that there is not much change in the rank of the occupation groups when these results are compared with those answers obtained on supervision. With regard to the setting of minimum diameter specifications, however, business-professional people, wage earners, and administrators of undivided estates made a much improved showing. This can be taken as an indication that these groups are somewhat concerned about minimum conservation practices but they have neither the time, means, nor knowledge to put into practice any other type of restriction. It seems to indicate a rather high degree of shrewdness on the part of these groups.

Indication of minimum concern. Further examination of Table 26 will reveal that the owners of 71 percent of the forest area had no intention of leaving any merchantable trees whatsoever after commercial timber cuts. This is the most discouraging thing revealed in Table 26, and seems to indicate either utter disregard

by owners toward forest conservation and/or an area of ignorance with respect to good and bad forestry.

Table 27 shows that retired people, real estate people, recreational groups, and part-time farmers were particularly guilty of having this low regard for forest conservation. It was not possible to get a valid analysis of this question for the nonforest industry, business-professional, and undivided estate groups.

The farmer, part-time farmer, and forest industry groups showed up well in the matter of supervision, but sank low in their attitude toward leaving a few merchantable trees. This seems to reveal that such owners were often the culprits themselves or at least an accessory after the fact. These classes of owners frequently handled their own cutting, and were often unable to resist cutting any tree that would yield them a cash return. When large pulp company owners were removed from the forest industry group a similar analysis showed a negligible interest by forest industries toward leaving any merchantable trees.

Class of Cutting Practice

Earlier it was pointed out how the on-the-ground inspection of actual cutting operations was the most satisfactory method of

evaluating an owner's management practices. James¹ claims it is the only valid measure of current timber management.

Unfortunately, in this study, financial and time limitations prevented the visiting of a large number of cutting areas. As previously pointed out, less than half of the area included in the sample was owned by persons who had sponsored a commercial timber cut in the last five years. Also, in the field this was not known until the owner was interviewed, and this frequently took place many miles from the forest. These obstacles served to reduce the number of observations on actual cutting results to a small sample, and readers should keep this point in mind when drawing conclusions from the data presented in this section.

Method of classifying cutting. In the cases where it was possible to visit and inspect the results of cutting made in the preceding five-year period a method of ocular estimation was used to classify cutting which had taken place as to whether it was good, fair, or poor. This method was the same as previously employed by James²

¹ Lee M. James. Op. cit., p. 258.

² Lee M. James. Forest cutting practices in Michigan. Michigan Agricultural Experiment Station, East Lansing, Technical Bulletin 238, June 1953, p. 31.

to evaluate cutting practices in Michigan, and the following quotation from him concisely describes the method:

Class of cutting refers to the silvicultural effectiveness of logging. The general principle is to judge whether the cutting (together with silvicultural measures accompanying it) will improve the stand, maintain it, or cause deterioration. The emphasis is not on the stand that is left, but on the anticipated changes in stocking, quality and species composition of the growing stock (including established reproduction) in the 10 years following cutting.

The critical point in the range of cutting practice is taken to be that at which a stand, if adequately protected from fire and grazing is barely maintained in stocking, quality, and species composition. Cutting which meets at least this standard is classed as fair, but as a minimum, the stand must show promise of attaining at least 50 percent of full stocking. Cutting which falls below this standard is classified as poor. It promises a decline in either stocking, quality, or species composition, or it will not result in 50 percent of full stocking. Cutting which will do better than this standard is classified as good. As a minimum requirement for good cutting, the stand must show promise of attaining at least two-thirds of full stocking.

It might be added that under such a system clear-cutting of some species like aspen may rate as good cutting, while the same system in northern hardwood stands would rate poor.

It is not suggested that the qualitative scheme employed here would meet with the unqualified approval of all foresters as it was applied to the several forest types of the study area. However, it is believed that agreement among foresters would be sufficient for the discriminations made herein.

Under this system of rating cutting practices, sixty-four different properties which had had some cutting in the preceding five

years were inspected. These sixty-four properties included a total area of 169,421 acres. When several different areas had been cut within the same ownership, only one area was inspected. Other cuttings on the same ownership, it was assumed, would not change the rating assigned the entire property.

Class of cutting for all owners. Table 28 shows how class of cutting practice varied for all ownership classes combined. Some three-fifths of the forest owners, holding 46 percent of the forest area, were found to be practicing poor cutting on their lands. Only 15 percent of the owners, with 23 percent of the forestland, were found to be employing forest cutting practices which would rate as good.

This depicts, also, what has come to be an old story in forestry; namely, that large forest owners generally practice a higher type of cutting than small owners. Individually, of course, many exceptions can be found to this generalization, but on the average it seems to hold for all regions of the United States.

Class of cutting by owner occupation group. Table 29 shows the class of cutting practice by broad occupation groups. Due to the size of the sample it was not possible to present cutting class data for all occupation classes. Nevertheless, the data are revealing.

TABLE 28
CLASS OF CUTTING PRACTICE

Class of Cutting	Percent of Forest Area	Percent of Forest Owners
Good	23	15
Fair	31	25
Poor	46	60
Total	100	100

The data clearly indicate that farmers (including part-time farmers) were the big problem area despite all of the educational work which has been concentrated on this group. The industry groups were doing much better than farmers. In terms of forest area, the industry group was found to be doing far better than the other two groups due to the influence of a few large owners.

The "other" group used in Table 29 includes all nonindustrial and nonfarmer owner classes. Grouped in this way, the

TABLE 29
CLASS OF CUTTING PRACTICE BY
OWNER OCCUPATION GROUP

Occupation Group	Class of Cutting ^a			Total
	Good	Fair	Poor	
<u>Percent of Forest Owners</u>				
Industries ^b	17	73	10	100
Farmers ^c	10	16	74	100
Others ^d	28	36	36	100
<u>Percent of Forest Area</u>				
Industries ^b	90	1	9	100
Farmers ^c	10	46	44	100
Others ^d	12	30	58	100

^aBased on the inspection of sixty-four different properties where a commercial cutting had been made within the last five years. The gross forest acreage of these properties was 169,421 acres, including one property greater than 100,000 acres.

^bIncludes forest and nonforest industries.

^cIncludes farmers and part-time farmers.

^dIncludes all other owner occupation classes.

indication is that these other private owners were having a better cutting job done on their land than farmers. Examination of the data before grouping revealed quite a wide dispersion among the occupation classes as used in other portions of this study. Most of that shown as poor cutting was due to the inclusion of the housewife-widow and retired occupation classes. Most of those indicated as using good cutting resulted from inclusion of the business-professional and wage earner occupation classes.

These results generally agree with other studies in which there has been an effort to appraise cutting practices or management practices by owner's occupation.¹

Class of cutting by distance of owner from property. The influence which distance of owner's residence may have upon cutting practice is shown in Table 30. These data contain several ownership classes, and are therefore subjected to the confounding influence of occupation classes. This effect has been reduced somewhat by eliminating two owner classes which were generally resident or generally absentee owners. However, sample size did not make it possible to analyze this question for one occupation class alone. This situation is particularly

¹ Lee M. James, Wm. P. Hoffman, and Monty A. Payne. Op. cit., p. 15. Also: Tennessee Valley Authority. Op. cit., p. 5.

TABLE 30

CLASS OF CUTTING PRACTICE BY DISTANCE OF
OWNER FROM PROPERTY^a

Distance from Property in Miles	Class of Cutting			Total
	Good	Fair	Poor	
(percent of forest area)				
On site	25	68	7	100
One to twenty-five	6	15	79	100
Twenty-six to one hundred	0	2	98	100
One hundred and up	0	53	47	100

^aIncludes all occupation classes excepting nonforest industries and farmers.

acute because very few cut-over areas were inspected which belonged to owners who lived more than twenty-five miles from the property.

From inspection of Table 30, one can conclude some trend in cutting class due to distance of owner from property. If one is willing to discount irregularities, there does appear to be a lack of good cutting associated with more distant owners.

Forest economists have long contended that absentee owners practiced poor forest management. However, there has been very little research evidence to support this claim. James¹ found in Mississippi that owners who lived farther than fifty miles from the property had generally poorer management than those living closer. The Tennessee² study indicated resident owners were better forest managers than nonresident owners.

Class of cutting by agent in charge of management. Some of the implications of owner versus manager as related to forest management arrangements were discussed earlier in this chapter. In this section the relationships these agents of management may have to actual cutting practices are explored.

¹ Lee M. James, Wm. P. Hoffman, and Monty A. Payne. Op. cit., p. 27.

² Tennessee Valley Authority. Op. cit., p. 10.

TABLE 31
CLASS OF CUTTING PRACTICE BY
AGENCY OF MANAGEMENT

Agent in Charge	Class of Cutting			Total
	Good	Fair	Poor	
(percent of forest area)				
Owner	18	32	50	100
Manager	40	31	29	100

Table 31 shows how cutting practices in the study area were found to be related to the agent in charge of management. The most significant relations brought out are that properties managed by owners generally had poorer cutting practices than those handled by managers who generally had more area under their control with good cutting practices. Much of the poor owner-managed forestland is attributable to that owned and managed by farmers or part-time farmers. The large percentage of manager-operated forest area with good cutting practices is due to a few large ownerships managed by professional foresters or competent resident managers.

Class of cutting practice by age of owner. In the preceding chapter, age of owner as related to the economic theory of conservation was discussed. Here actual cutting practices are related to owner's age. In Table 32 this relationship is shown as it was found in this study for the farmer occupation class. The separation of farmer owners in this case was possible because of the size of the sample. This method has the advantage of eliminating the confounding effects of mixing all owner occupation classes together.

Examination of Table 32 shows a definite peak of good cutting practices in the forty- to fifty-year age bracket, with a tapering off on either side of this point. The large share of poor cutting practices shown in the older brackets may be explained partially by the contended increase in a person's rate of time preference with age (previously discussed). Another partial explanation is that the older age classes are less well enlightened (particularly among farmers) and more bound by the traditional ways of timber cutting than younger owners.

The large share of poor cutting practices found in the farmer class under forty years of age seems likely to be the reflection of the relatively poor income position of these owners. Although the gross income rank of young owners may be high, they are frequently

TABLE 32
CLASS OF CUTTING PRACTICE FOR FARM OWNERS
BY AGE CLASS

Age Class in Years	Class of Cutting Practice			Total
	Good	Fair	Poor	
(percent of forest area)				
Under forty	0	0	100	100
Forty-one to fifty	22	51	27	100
Fifty-one to sixty	0	35	65	100
Over sixty	25	0	75	100

heavily obligated with debt, and hence may be induced to liquidate their forest growing stock.

When class of cutting practice according to age of owner was analyzed for all individual owner occupation classes combined, an almost identical pattern to that presented in Table 32 was revealed.

Class of cutting practice by length of tenure. It has been the opinion of most persons in resource conservation work that as length of tenure increased so did the owner's concern for his resource. This was discussed at some length in the preceding chapter under length of tenure. As was pointed out at that time, it is somewhat unfortunate that such a belief has gained almost ubiquitous acceptance without research verification.

The influence which length of tenure may have on class of cutting practice as determined by this study is shown in Table 33. From this table it can be seen that owners who have held their land less than seven years owned more land that was poorly cut and less land that was well cut than was the general case with the other length of tenure groupings. However, the sixteen to twenty-five year length of tenure group stands out as an exception to this generalization, and is difficult to explain. It is entirely possible that this irregularity is due to the small size of the sample on which cutting practices were evaluated.

TABLE 33
CLASS OF CUTTING PRACTICE BY
LENGTH OF TENURE

Length of Tenure in Years	Class of Cutting			Total
	Good	Fair	Poor	
(percent of forest area)				
One to six	9	42	49	100
Seven to fifteen	35	30	35	100
Sixteen to twenty-five	2	42	56	100
Twenty-six and up	36	27	37	100

Due to the size of the sample, it was not possible to get a reliable comparison within a particular occupation as to the possible influence of length of tenure. It is doubtful, however, if any significant difference could have been observed within occupation groups had the sample size permitted such an analysis. James¹ reported in his Mississippi study that there was no relation between management and length of tenure, either for all owners or for particular occupation classes.

Assuming that significantly poorer management was discovered in the less than seven year length of tenure group, it is very doubtful if it could be supposed as a cause and effect relationship. There are many factors common to new owners which could contribute to a poorer caliber of management among these owners, for example the financial pinch new owners frequently experience, the high proportion of speculative owners in the short length of tenure classes, et cetera.

Class of cutting practice by number of generations property has been in family ownership. In the preceding chapter there was a rather lengthy discussion concerning the possible effects on

¹ Lee M. James, Wm. P. Hoffman, and Monty A. Payne. Op. cit., p. 27.

conservation by the length of time a property had been in family ownership. Here in Table 34 are exhibited the relationships between cutting practice and generations the property had been retained in family ownership. The presentation here is for the farmer occupation class alone. The reason for this approach was to eliminate the possible confounding influence of other interests, et cetera, associated with the different occupation classes.

Table 34 shows a definite trend exactly inverse of that which was anticipated. The area owned by no generations prior to the present ownership had the best cutting while that which had been in the family two or more generations had been very poorly cut. The same comparison for all owner classes taken together (no table presented) showed an identical trend, with a very similar proportional distribution.

The picture gained from the field work was not one of well-cared-for property associated with long family ownership; rather, it was completely opposite this anticipation. Long-time family owners seemed to fall into two groups. One group consisted of those just hanging on and practicing typical subsistence agriculture which included milking their forest resource for all that could be obtained from it. The other group (and this would not include farmers) was made up of those (mostly wage earners) who had gone off

TABLE 34

CLASS OF CUTTING PRACTICE FOR FARM OWNERS BY THE
NUMBER OF GENERATIONS PROPERTY HAS
BEEN IN FAMILY OWNERSHIP

Number of Generations	Class of Cutting Practice			Total
	Good	Fair	Poor	
(percent of forest area)				
None	21	58	21	100
One	5	20	75	100
Two	0	0	100	100

to live and work elsewhere and were still hanging on to the old family lands. The attitudes of these owners toward their land holdings seemed to alternate between sufficient sentimentality to cause them to retain the land and almost bitter resentment over any expenses involved with the ownership on the other hand. Sandwiched between these two groups were the part-time farmers who shared in both of these practices and beliefs.

It can only be concluded that the expression "land, the heritage of the underprivileged," though coined during the great depression, may still serve as an important explanation for the actions of a large segment of the forestland owners in northern Michigan, particularly those "problem" forestland owners.

Class of cutting practice by expectation of continued family ownership. Again the analysis here treats further a concept first developed in the preceding chapter. The implication made was that those owners who anticipated their sons to some day own the land after them might be inclined to at least refrain from destructive cutting practices.

Table 35 presents the relationship found between the expectation farmers had for continued family ownership and on-the-ground cutting practices. The analysis in Table 35 was made for the

TABLE 35

CLASS OF CUTTING PRACTICE FOR FARM OWNERS
BY EXPECTATION OF CONTINUED OWNERSHIP

Expectation	Class of Cutting Practice			Total
	Good	Fair	Poor	
(percent of forest area)				
Do not expect to continue ownership	0	0	100	100
Expect to continue ownership . . .	14	37	49	100

farmer owner class alone in order to avoid possible confounding influences associated with different occupation classes. The data indicate quite clearly that farmers expecting to retain ownership in their family had practiced better cutting than those who had no such future plans for their properties. The analysis for all noncorporate owner classes combined showed a very similar trend.

The ameliorating influence on poor cutting practices achieved by extending the owner's planning horizon beyond his own period of life expectancy appears to conform with economic theory. If it had

been possible to correlate cutting practices with anticipated future income for the present owner and for subsequent family owners it seems likely that the same direct relationship would have been found.

Class of cutting practice according to objective of management.

In the preceding chapter objective of ownership was treated in a general and somewhat theoretical fashion for all owners and for occupation classes. The approach here is to examine objective of ownership in terms of actual performance in handling the forest resource. Table 36 presents the summation of these findings.

The findings presented here (Table 36) pretty well conform with expectations and findings from similar studies in other parts of the country.¹ Objectives associated with industrial ownership have by far the best cutting practices. These would include: production for owner's wood-using plant and "other." The good showing of the objective listed as "other" is attributable mostly to public utility owners who were holding for watershed protection purposes. The poor showing of owners whose objectives were investment or speculation, clearing for agriculture, and "inactive" is as would be expected.

¹Ibid., p. 28.

TABLE 36
CLASS OF CUTTING PRACTICE BY
OBJECTIVE OF MANAGEMENT

Objective of Management	Class of Cutting			Total
	Good	Fair	Poor	
(percent of forest area)				
Farm usage: any combination of home use, timber sale, and pasture	10	47	43	100
Growing timber for sale	8	24	68	100
Production for owner's wood- using plant	70	11	19	100
Investment or speculation	2	15	83	100
Sale of mature timber	0	71	29	100
Sale of mineral or mineral rights	0	0	0	(a)
Clear for agriculture	0	12	88	100
Recreation or residence	4	54	42	100
Inactive ^b	0	0	100	100
Other ^c	98	0	2	100

^aNo interviewees made cut in last five years having this objective of management.

^bInactive is used to indicate management without a specific purpose sufficiently well defined to place in a particular category.

^cOther is used to indicate some miscellaneous but specific objective not listed separately above.

The large portion of poor cutting by owners whose objectives were growing timber for sale may require some elaboration. The explanation seems to be required because of possible confusion between growing timber for sale and sustained-yield forestry. As conceived in this study, growing timber for sale did not necessarily mean that it was not being grown for liquidation purposes. To understand that trees grow is a simple concept, but to understand how cutting influences subsequent stand development and the further implications of sustained yield is a world apart in the level of understanding.

The poor cutting on the large portion (43 percent) of land being held for farm-usage purposes conforms with the findings throughout this study. Most of this land is farmer-owned and farmers have consistently exhibited themselves as a problem area in forest conservation.

Many observers will be surprised by the lack of a better showing on the part of those owners holding for recreational or residence purposes. The indication seems to be that other interests definitely rated above that of timber production with these owners. Many persons having this objective of ownership frankly stated that they were interested in no forest practice which might in the slightest adversely affect the game population. Also, one or two

cases were noted where mischievous timber operators could be blamed for inciting owners into a belief of incompatibility between good forestry and good game management.

CHAPTER VII

ATTITUDES OF OWNERS TOWARD FOREST MANAGEMENT

In the preceding chapter some measures of forest management were postulated, and in turn employed to evaluate actual management practices. Also, the relations of many characteristics of forest ownership to forest management were examined.

In this short chapter the emphasis is shifted to attitudes of owners as an explanation for poor timber management. Here a high degree of poor forest management has been accepted as an actuality. The problem now is to examine the forest owner pretty much as a separate entity. This analysis goes as far into the twilight zone between economics and psychology as an economist should dare to tread. No doubt many of the answers lie beyond this limit; nevertheless, it seems that there is much to be gained for forest economics by going as far as possible.

It should be pointed out that an inherent limitation of the evaluations of forest owners required for this type of an examination is that it may become more of a test of the interviewer's ability to classify owners' attitudes than a measure of the attitudes themselves. Certainly no two interviewers working independently

would be able to come up with exactly the same evaluations of the same owners. Fortunately, in this study all interviewing was done by the same person. Thus the results should be a valid comparison of the situation within the study area, although not an absolute measure of it.

Owners' Concepts of Timber Management

In order to evaluate owners' concepts of management, concepts were grouped into seven general categories and arranged in a progression of ascending order. These concepts ranged from "no idea" to "high, continuing yield of timber products," and will be found listed in Table 37. Direct questions were not asked the persons being interviewed. Instead, attempt was made to draw out the owner's thoughts in conversation and then rate him on this pre-arranged scale. This rating was entirely independent of the owner's ratings on cutting practices, et cetera.

For all owner classes combined. Inspection of Table 37 will reveal that less than 1 percent of the forest owners, who held 5 percent of the forest area, rated at the top of this scale. Also, 6 percent of the forest owners, who held 5 percent of the forest area, had almost no concept of forest management. In terms of

TABLE 37

OWNERS' CONCEPTS OF TIMBER MANAGEMENT

Concepts of Management	Percent of Forest Area	Percent of Forest Owners
No idea	5	6
Fire protection or reforestation and/or refraining from cutting .	34	72
Light cutting and other meas- ures for public good, at some personal sacrifice . . .	20	10
Light cutting and other meas- ures economically desirable in the long run, but not at present	17	8
Light cutting, economically desirable both in the present and long run	16	4
Fire protection and light cutting, economically desirable both in the present and long run . . .	3	(a)
High, continuing yield of timber products	5	(a)
Total	100	100

^a Less than 0.5 percent.

forest area or forest owners, the distribution of owners on this scale would form a skewed bell shape if plotted.

Comparison between the two columns in Table 37 shows that small owners rated lower in their concept of management than large owners. This conforms with all of the other findings of this study with respect to size of ownership.

In his Mississippi ownership study James¹ used an almost identical scale for rating concept of management. His analysis, in terms of forest area only, showed an inverted bell shape, with the largest proportions at either end of the scale. Much of the high rating was attributed to a few large ownerships, with small owners accounting for much of the area rated under a low concept of management.

Michigan forest owners tended to think of forestry largely in terms of fire protection, planting, and little timber cutting (72 percent of the owners, 34 percent of the area). This seems to be the result of the demonstration effects of the most common type of forestry Michigan owners have been able to observe. Few owners seemed to think in terms of thinnings or harvesting mature forest crops according to a cyclical plan or cutting budget.

¹Ibid., p. 23.

This would seem to indicate that the demonstration value of planted forests is quite high. It is logical that Michigan forest owners would think of forestry largely in terms of forest plantings inasmuch as Michigan, with over 760 thousand acres of commercial forest plantations,¹ leads the nation in this phase of forestry. It is interesting to note that many interviewees did not even recognize themselves as forest owners when they had no coniferous plantings on their lands. On the other hand, owners who had a small acreage of coniferous plantings took great pride in them and usually placed more value on a few acres of this kind of land than several times that amount of native hardwood forestland.

As Michigan's forest plantations approach maturity and begin to yield income from thinnings, demonstrations of a more advanced type of forestry will become common. As this situation evolves, Michigan forest owners are likely to develop a higher concept of forest management.

In order to aid in the evaluation of forest owners' attitudes toward forest management a question was asked concerning their attitude about forest fire. Answers to this question were rated on a scale of four which ranged from "strongly opposed" to "in favor

¹George F. Burks. Op. cit., p. 33.

of forest fires." Analysis of this question proved more significant than other questions asked. About three-fourths of the owners expressed strong opposition to fire, with the other one-fourth being classed as mildly opposed. No owners were found who were indifferent to, or in favor of, forest fires. This is about the same reaction James¹ obtained to a similar question in Mississippi, where forest burning is a serious problem. Based on personal experiences and annual burning records, the author is of the opinion, however, that Michigan forest owners are much more genuine in their concern for forest fires than is the case with forest owners in the South. One Michigan owner of about six hundred acres of forestland, on being interviewed, summarized owner opinion quite well when he said,

I've learned my lesson on fire. Two years ago I had a small brush burning fire get away from me and burn over most of a forty of good young timber. I not only lost the young trees but was assessed the cost of fighting the fire by the Conservation Department.

It would appear that both education and law enforcement have been very effective in Michigan in developing a strong owner opposition to forest fires.

¹ Lee M. James, Wm. P. Hoffman, and Monty A. Payne. Op. cit., p. 22.

By occupation classes. The rating of forest owners' concepts of forest management for all classes of owners was interesting for information purposes, but in order to have meaning in terms of possible forest policy it was necessary to relate these concepts to owner groups. In Table 38 owners' concepts of management have been analyzed by occupation group in terms of forest area.

This presentation brings out some points about occupation groups which through several chapters have grown to be a rather old story. The industry groups, both forestry and nonforestry, outrank any other occupation class in their concept of forest management. Again, the analysis by separate industries (not presented in the table) indicated a few large owners were responsible for the good showing.

The two farmer classes, wage earners, undivided estates, and retired persons hold their customary low ranking. This would seem to indicate that the similarly poor forest management record of these groups was due in large part to ignorance. These were the groups with particularly strong feelings that forestry consisted mostly of tree planting and fire protection.

Somewhat more encouraging is the relatively good showing attained by the business-professional, housewife-widow, and recreation group classes. The high rank attained by the business-

TABLE 38

OWNERS' CONCEPTS OF TIMBER MANAGEMENT
BY OCCUPATION CLASS

Occupation Class	Concepts of Management		
	No Idea	Fire Protec- tion and/or Refraining from Cutting	Light Cutting and Other Measures for Public Good at Some Per- sonal Sacrifice
	(percent of forest area)		
Forest industry	0	15	10
Nonforest industry .	2	4	0
Farmer	4	44	31
Part-time farmer . .	21	32	19
Business or professional . .	0	18	20
Wage earner	4	67	3
Housewife or widow .	3	30	27
Recreation groups . .	0	0	17
Real estate	11	37	23
Undivided estate .	0	92	7
Retired	3	46	33

TABLE 38 (Continued)

Concepts of Management				
Light Cutting and Other Measures Eco- nomically De- sirable in the Long Run, but Not at Present	Light Cutting, Economically Desirable both in the Present and Long Run	Fire Protec- tion and Light Cutting Eco- nomically De- sirable both in the Present and Long Run	High Con- tinuing Yield of Timber Products	Total
(percent of forest area)				
13	1	19	42	100
1	9	0	84	100
14	3	4	0	100
18	8	2	0	100
8	54	0	0	100
12	14	0	0	100
0	40	0	0	100
61	13	9	0	100
24	0	5	0	100
0	1	0	0	100
14	4	0	0	100

professional people is in line with expectations for this comparatively well enlightened class. The same might be supposed for recreationist groups since they were usually composed largely of business or professional people. Somewhat more surprising was the relatively good showing of the housewife-widow class.

Comparison between the concepts of management presented here by occupation classes and the performance of the same classes when rated on actual cutting practices should reveal whether a more enlightened concept of management insures better cutting practices. Apparently this was not the case because the housewife-widow class had a record of poor forest practices but a rather high concept of forest management. The other classes appeared to have been practicing a type of cutting in rather close alignment with their concepts of management.

Owners' Recognition of, and Explanation for, Poor Timber Management

Attention is directed in this section to two important questions relative to forest owners' attitudes. First: Do owners realize that there is a physical possibility of improving their forest management? Second: If they think it can be improved, why are they hesitant to take action to improve it?

Recognition of possibility of improving forest management.

The reactions of forest owners to the first question mentioned above are presented in Table 39. It can be summarized by saying that over two-fifths of the owners of about an equal portion of the forestland realized that it would be physically possible for them to improve their forest management. Little disparity is noted between numbers of forest owners and portion of forest area on this question. The absentee mail respondents to the same question answered quite differently. Owners of 98 percent of the forestland (of those replying to the question) indicated that they believed their management could be improved.

One important implication of these results is that many owners practicing poor or only fair cutting did not even realize that their cutting was capable of improvement. This appears evident when one considers that owners of 77 percent of the forestland (Table 28) were found to be practicing only fair or poor cutting, while owners of only 44 percent of the forestland (Table 39) recognized the possibility that their forest management could be improved.

Absentee owners who answered by mail and who appeared, on the basis of answers to questions concerning management practices, to have had better practices also recognized a greater chance

TABLE 39

OWNERS' RECOGNITION OF THE POSSIBILITY OF
IMPROVING THEIR FOREST MANAGEMENT

Owners' Recognition	Percent of Forest Area	Percent of Forest Owners
No opinion	2	1
Do not believe they could improve	54	56
Think they could improve	44	43
Total	100	100

for improving their forest management. James,¹ in his Mississippi study, found about the same relationship; i.e., that those practicing the best management also recognized the greatest opportunity for improving it. One can conclude that there is a large number of owners controlling a sizable forest acreage in the study area who could profit from a minimum exposure to forestry education. The old adage that ignorance breeds complacency has been demonstrated again.

Reasons for believing management could be improved. In order to ascertain some explanation from owners for their own shortcomings, those who admitted their management could be improved were asked why they did not do better. This approach excluded more than half of the owners, whose holdings comprised more than one-half of the forestland (refer back to Table 39), many of whom actually practiced poor cutting but refused to admit it. This is definitely a limitation of the analysis presented here, and should be kept in mind by the reader.

Because it is often impossible for owners to offer a clear-cut reason, a list of likely reasons was prepared in advance of the interview (Table 40). First and second choices were checked at the

¹Ibid., p. 24.

TABLE 40

OWNERS' EXPLANATION FOR BELIEVING
MANAGEMENT COULD BE IMPROVED

Owners' Explanations	Percent of Forest Area ^a
Lack of interest in timber production	7
Present high prices preferred to uncertain prices of the future	0
Immediate need of liquidating timber for cash	(b)
Belief that woods do not need care	2
Inability to supervise because of physical limita- tions or demands of more remunerative activity .	29
Long periods between incomes	2
Area too far away for constant supervision	14
Expected returns of management do not justify the necessary costs	(b)
Inability to get contractor to cut forest con- servatively	5
Property too small to bother with	1
Unfulfilled hope to clear forest for pasture or other land use	10
Uncertainty of ownership in undivided estate	1
Don't know or no clear explanation	11
Other	18
Total	100

^aIn the derivation of percentages, first choices were given twice as much weight as second choices.

^bLess than 0.5 percent.

time of the interview in accordance with those which seemed to offer the best explanation. When the results were analyzed, first choices were given twice as much weight as second choices.

The results of this analysis presented in Table 40 are interesting. The most significant thing is that owners representing nearly three-tenths of the forest area stated "inability to supervise because of physical limitation or demands of a more remunerative activity" as the reason for their admission of poor management. The same analysis applied to the mail questionnaires resulted in rating the same explanation as most important and placed even greater emphasis upon it. The second most important reason listed by those interviewed in person was "because the area was too far away to bother with." This would seem to indicate bright prospects for forest management consultants.

Mail respondents picked lack of interest in timber production as their second most important reason for admitting poor timber management. No other answers seemed to stand out among the mail replies because of their magnitude.

The second reason listed in Table 40 is outstanding because it was offered by no owner interviewed and by no owner replying to the mail questionnaire. Apparently, concern over timber prices and present income was no handicap. The reason listed third in

Table 40 stands out in the same fashion, and the same remarks apply to its lack of importance. These reactions by forest owners may be somewhat disappointing to many forest economists who have long cherished the belief that the ever-present pressure to liquidate timber for immediate cash was a major cause for poor forest management. In regions where owners control stumpage worth several hundred dollars per acre, this is no doubt an important reason. In his Mississippi study James¹ found that this pressure to liquidate was important. In a region where aspen pulpwood stumpage was bringing one to two dollars per cord and running but a few cords per acre it was difficult for owners to be much concerned over quick income possibilities, particularly when taxes were costing only a few cents per acre. Of course, this situation could change with either improved market prices or a decline in earning opportunities for owners.

The fact that over one-third of the area owned by mail respondents recognizing a chance to improve their management was held by persons expressing a lack of interest in timber production seems significant. It can be taken as further evidence of the importance of forestland as a consumer's good. This group will be difficult to appeal to by ordinary forestry educational methods.

¹Ibid., p. 25.

CHAPTER VIII

FOREST TAXATION

Taxation has been a major concern of forest economists for many years. Many studies have been made and many theories advanced concerning the influence of all types of taxes upon the handling of the forest resource. The reasons for all this attention to taxation in resource conservation under the institution of private property in the United States can be well summarized by quoting from Ciriacy-Wantrup¹ as follows:

Like the other derived property institutions, the tax system has highly significant but unintended, unrecognized, and socially undesirable effects upon conservation decisions of private planning agents. In this sense taxation is frequently an important obstacle for conservation policy. On the other hand, the tax system can be employed easily and effectively as a tool of conservation policy.

In the brief space that can be devoted here to the presentation of the subject of forest taxation, an exhaustive treatment was not possible. It has been necessary to treat much of the background

¹ S. V. Ciriacy-Wantrup. Resource conservation, economics and policies. Berkeley, University of California Press, 1952, p. 168.

information on taxation quite superficially and to place emphasis instead upon the phases of taxation investigated in this study.

Almost all forms of taxation are capable of having a bearing upon forest conservation. Here, however, only three forms are treated: the general property tax, the forest yield tax, and the federal income tax. Also important but not considered here are death taxes.

The General Property Tax

Foremost of all forms of taxation in its apparent influence upon the practice of forestry by private land owners is the general property tax. It is one of the oldest forms of taxation known, but it has reached its greatest development in modern times in the United States.

The general property tax is an ad valorem tax levied upon wealth and usually collected annually. As it applies to land and immobile property it is usually called the real property or, simply, the real estate tax. The two parts of the tax are its base and its rate. Base is the value of the property to which the tax applies and rate is the percent (usually expressed in mills) of the value collected as the tax.

Since uniform rates within political provinces are usually specified by law, the value placed on property is quite important. This valuation process is usually referred to as assessment. In terms of economic theory this value is usually thought of as being in line with the discounted present worth of future net incomes which the property is expected to yield.

Effect upon forest conservation. There seems to be little doubt that the ad valorem property tax levied annually against forestland has had a deleterious effect upon the retention by private owners of forestlands for sustained yield forestry. Greeley¹ summarizes this effect as follows:

A yearly tax ^{burden} on standing timber accumulates the longer it is held before cutting. In many cases the accumulating tax "burden" is a negligible part of the increased value of the stumpage from economic causes, railroad building, or whatnot. If stumpage values are stationary or declining or the owner is short of capital, mounting ad valorem taxes may induce him to sell or cut his timber or, as often happened in the days of speculation in cheap public stumpage, to quit paying taxes and forfeit his land to the county. A large proportion of the public timberlands acquired in the "cut-out-and-move-on" period of American forestry were "dropped" for taxes after logging because their owners could see no future returns from holding them. The yearly property tax thus had its part in the instability of forest ownership during the "free timber" period, but it was only one of many factors. Often its upsetting influence

¹William B. Greeley. Forest policy. New York, McGraw-Hill Book Co., Inc., 1953, p. 215.

was heightened by the increasing assessments placed on uncut timber in order to obtain needed county revenue from a diminishing tax base or to take while the taking was possible.

From the standpoint of economic theory, annual general property taxes encouraged forest depletion. If one assumes them to be in line with the present value of assets; i.e., the discounted value of future incomes, the annual property tax becomes one paid on profits expected for all future years each time it is paid. The rational man acting to minimize his tax burden will tend to try to shift these profits toward the present. The net result of this in forestry then would be the depletion of forest capital by overcutting.

In the real world conformity with this theory depends largely upon tax rates on forest capital and forestland relative to tax rates on alternative forms of investment opportunity for the liquidated capital.

Forest property taxation in Michigan. The history of forestland taxation in Michigan was partially covered in Chapter I, and hence will be treated very briefly here to avoid repetition. Generally, forest development or depletion in Michigan as affected by the annual property tax has conformed with the citation above from Greeley.

During the era of timber depletion (peak 1860 to 1890) in Michigan local governmental services were developed to provide for

the population which had associated itself with the lumbering economy. Many times these governmental costs exceeded actual need because the development of a sound and flourishing agricultural economy was expected to follow logging. Once this governmental machinery was launched it seemed politically and administratively impossible to contract it. Likewise, the realities of agricultural impossibility were difficult for local inhabitants and people of the state to accept.

The net result of this situation was expanding or uniform governmental needs for revenue with a steadily contracting tax base (including production potential) from which it could be extracted. Fairchild and associates¹ reported that annual forestland taxes for the section of Michigan covered by this study had increased from an average of 27 cents per acre in 1900 to \$1.06 in 1925. The pace of tax forfeiture which was high even before the turn of the century continued to increase parallel with the increases in tax rates with culmination being reached about 1933 when the constitutional amendment was passed limiting property tax rates to 1.5 percent (15 mills) of assessed valuation. Forced by this law and

¹ Fred R. Fairchild et al. Forest taxation in the United States. U.S. Department of Agriculture, Washington, Miscellaneous Publication 218, 1935, p. 249.

commensurate with the trend of the times Michigan shifted from heavy reliance upon the general property tax to other means of financing. Nelson¹ found that 83 percent of Michigan's local and state revenue was derived from property taxes in 1900, while only about 40 percent was derived from the same sources in 1935. This trend has continued until at present the importance of other tax sources dwarfs the general property levy.

These basic changes in the tax system have brought about a lessening of the burden on forestland. As a result of this and the increased economic health of the state and nation following World War II, there has been comparatively little tax delinquency on forestland.

Findings of the present study. This part of the study was concerned with the annual general property tax as it influenced forest ownership and forest management. Basic to this consideration was the need to determine the actual present tax on forestland. In order to accomplish this, forest owners when interviewed were asked what taxes they were paying on forestland. This question was asked

¹ Alf Z. Nelson. Forest land taxation in Michigan. Forest Service, U.S. Department of Agriculture, Washington, Mimeographed, 1940, p. 5.

owners if they owned a parcel of forestland which was assessed and taxed separately from land having any improvements on it. This was found to be possible in most cases. The results are presented in Table 41.

An examination of Table 41 reveals that most of the forestland is taxed between 10 and 14 cents per acre. Significantly, 89 percent of the forestland was taxed at less than 25 cents per acre. This would seem to indicate that the annual general property tax is hardly a burden on forest owners. Very few owners expressed much of any concern over their property taxes.

Very little dispersion in tax rate was noted from county to county, but a valid geographical comparison was not possible due to the size of the sample. However, equalization¹ is carried out rather efficiently throughout Michigan and consequently not much geographical dispersion was expected.

A direct question was not asked owners concerning how much of a sustained-yield forestry obstacle annual property taxes offered. However, in the discussion accompanying the interview almost no

¹Equalization refers to the process whereby state tax officials adjust assessed valuation so as to insure uniformity among local political units. Where the tax rate expressed in mills can vary only from 0 to 15 mills as is the case in Michigan assessed valuation is the most important determinant of per acre tax rate.

TABLE 41

GENERAL PROPERTY TAXES PER ACRE OF FORESTLAND
FOR ALL OWNER CLASSES

Tax in Cents per Acre	Percent of Forest Area
None to nine	8
Ten to fourteen	35
Fifteen to nineteen	24
Twenty to twenty-four	22
Twenty-five to twenty-nine	3
Thirty to thirty-four	1
Thirty-five to forty-four	1
Forty-five to forty-nine	3
Fifty and up	3
Total	100

such objections were voiced by the owners. Also, because of the sample size it was not possible to correlate cutting practices with tax rates. In his Mississippi study James¹ found no definite pattern of relationship between tax rate and management decisions. At 1953 per acre tax rates in Michigan it is also doubtful if any appreciable influence on management practices existed.

Inasmuch as a considerable portion of the forestland of northern Michigan is owned by persons living some distance from their holdings (Chapter III), the interest they take in their forest management can have a profound influence on the future forestry situation. It also follows that high and particularly discriminatory taxes toward absentee owners would result in a large turnover of land among this group. This, along with the recognized and previously discussed tendency for high taxes to discourage conservation, could contribute to poorer rather than better forest practices.

In order to shed some light on this question, Table 42 analyzes annual property tax rate in cents per acre according to distance of owner from property. The data presented indicate some tendency toward higher forest taxes for absentee owners than for

¹ Lee M James, William P. Hoffman, and Monty A. Payne. Op. cit., p. 33.

TABLE 42

GENERAL PROPERTY TAX ON FORESTLAND BY
DISTANCE OF OWNER FROM PROPERTY

Tax in Cents per Acre	Distance from Property in Miles				
	On Site	1-25	26-100	101-200	201-up
	(percent of forest area)				
0 to 9	9	14	1	0	0
10 to 14	17	34	85	32	0
15 to 19	23	21	11	43	33
20 to 24	47	10	(a)	25	44
25 to 29	3	2	3	0	19
30 to 34	0	2	0	0	0
35 to 44	1	1	0	0	0
45 to 50	0	8	0	0	0
50 and up	(a)	8	0	0	4
Total	100	100	100	100	100

^a Less than 0.5 percent.

those living close at hand. On-site owners, whose taxes appear to violate the trend somewhat, may have slightly higher assessed valuations on their forest holdings due to the proximity of the timberland to farm units. This supposition, however, does not agree with the findings of a rather exhaustive tax study made by Besley¹ in West Virginia. Besley found that farm woodlands were taxed at an average rate of 2.5 cents per acre, while nonfarm forests were taxed at an average rate of 20.5 cents per acre.

The Michigan Forest Yield Tax

Michigan has had on its statute books since 1911 a woodlot yield tax, and since 1925 a commercial yield tax law whose specific purposes are to provide some relief from the annual property tax for forest owners and thereby encourage sustained yield forestry. It is the objective of this section to consider the extent of the usage of these laws and owners' attitudes toward them.

Theory and purpose of the yield tax. Earlier in this chapter the disadvantages of the annual property tax on forestland were

¹Lowell Besley. Taxation of forest lands in West Virginia. West Virginia Agricultural Experiment Station, Morgantown, Bulletin 333, November 1948, p. 28.

discussed. In order to avoid these disadvantages many schemes of special taxation were devised, foremost among them the forest yield tax. There are about as many versions of the yield tax as there are states with yield tax laws.¹ Basically the purpose of most of these schemes is to cancel the ad valorem annual general property tax on standing timber and to substitute for it a tax on the timber when it is harvested. The general property levy on the land alone may be continued at some nominal and fixed fee or under conventional assessment and rate; or the tax on the timber yield at harvest may also be in lieu of any tax on the land. When levied on the timber harvest, the yield tax may be ad valorem on the product sold or harvested, or it may be imposed on physical units of production.

In theory the yield tax is generally considered neutral in its effects on conservation;² i.e., private owners are not induced to shift their production, either toward the present or toward the future. However, depending on the rate of taxation on other resources, users may be forced out or encouraged to enter forestry. There are also

¹About fifteen states have yield laws. Several other states have some special form of taxation for timberlands. Most laws are optional.

²S. V. Ciriacy-Wantrup. Op. cit., p. 186.

some other exceptions to the neutrality of the tax. For example, it may make some forest thinning practices uneconomical and thereby reduce future growth potential. Also, when levied on a per unit basis it may encourage the leaving of inferior trees at the time of harvest and thereby contribute to the deterioration of the forest through successive rotations. These are disadvantages, however, that can be corrected by enactment of a yield tax law which contains special provisions to compensate for such theoretical weaknesses.

From the standpoint of administrative efficiency yield taxes are a superior form of taxation because they are economical to collect and assessment is accurate. Compared with net-revenue taxes, yield taxes are inferior because they do not take into consideration ability to pay.¹

History and terms of the Michigan yield tax.² The Michigan forest yield tax exists in two forms. One is known as the woodlot yield tax, the other the commercial forest yield tax. The former

¹ Loc. cit.

² This section is based largely upon: Warner Deitz. A study in Michigan forest land taxation. Unpublished M.S. thesis, Michigan State College, 1954, 57 pp.

was designed primarily as an aid to farm woodland owners, the latter as an aid to larger owners interested in sustained yield forestry aside from all other objectives.

The contributing factors in Michigan's history which led to the initial enactment of the yield tax laws were discussed earlier in this chapter, and also in a previous chapter (Chapter I). The essential and immediate reasons for enactment common to both of the laws were: General property taxes on forestlands were high due to high costs of local government. The property tax was completely out of line with the productive value of forestlands. A high tax delinquency rate due to the two reasons above was resulting in a high rate of reversion of forestlands to state oversight.

Woodlot yield tax. Before the turn of the century some lumbermen spoke out against the property tax on forestland and proposed tax reforms amounting to a type of yield tax. Pressure for reform gradually increased and resulted in a farm woodlot yield tax passing the legislature in 1903 but which failed to become law because the governor vetoed it. In 1911 the Foster Act, a farm woodlot yield tax bill, did become law.

The Foster Act failed to attract but one listing, and was superseded in 1917 by the Woodlot Act, which closely resembled the initial

act except for granting more liberty to the farmer to make tax-free home use cuts. This act is still in force today, but has proved little more effective than its predecessor. As of 1939 only 2,538 acres involving seventy-two separate properties had been listed.

Under the woodlot yield tax listed woodlands are assessed at not more than one dollar per acre. The regular ad valorem annual general property tax rate then applies to the assessed valuation. When the timber is harvested a yield tax is imposed at the rate of 5 percent of the stumpage value.¹

Qualification requirements under the woodlot yield tax restrict listing to forests which are a part of certain types of farm units. The land listed must be not over one-fourth of a tract not over 160 acres in size of which at least one-half is improved and devoted to agriculture. Stocking must be of a species approved by the State Board of Agriculture. Planted areas must contain at least 1,200 trees per acre, while open areas in natural stands must be planted to trees with a minimum spacing of six feet. Other details are spelled out in the law.

¹Division of Forest Economics, Forest Service, USDA. State forest tax law digest of 1945. Forest Service, USDA, Washington, 79 pp., Dec. 1945.

Commercial forest yield tax. In 1922 a strong movement got underway which sought forest tax reform for larger owners interested in sustained yield forestry. Involved were lumbermen, other industrialists, and foresters. This effort was largely responsible for the passage of a yield tax bill the following year (1923) by the legislature but which the governor vetoed. Efforts, however, continued, and the Commercial Forest Reserve Act, better known as the Pearson Act, became law in 1925.

The Commercial Forest Reserve Act also has failed to attract a large listed acreage. As of 1950 there were only 114,407 acres of commercial forest reserve listings in the state. However, cumulative listings have mounted consistently except for 1935 and 1940 when sharp drops were noted. These sudden drops in total listings may have been due to the upswing in stumpage prices in those years and the consequent desire for some owners to take advantage of the situation and liquidate. Since 1950 a sharp increase in listings has been reported.

As of 1951 some 81 percent of the listings were controlled by three large industrial owners. Listings by counties for 1948 revealed that only 7,760 acres were listed in the thirty-one counties included in the area encompassed by this study.

Under the Commercial Forest Reserve Act an annual property tax of 5 cents per acre replaces the general property tax. When forest products are harvested they are taxed at 10 percent of their gross value if the property has been classified nine years or longer. For properties classified less than nine years the rate is less, and is graduated according to length of time registered.¹

In order to qualify for listing under the Commercial Forest Reserve Act the property must include no natural resource other than forest and no portion of the property may be used for agricultural, mineral, grazing, industrial, recreational, or resort purposes. The owner must also declare his intention to develop a commercial forest and must not restrict public hunting or fishing upon it. The land has to be capable of growing commercial timber, but must not be overstocked with mature timber. Stocking of timber on the land must be sufficient to show promise of developing a commercial stand at maturity. Other more detailed specifications for listing and continued qualification are spelled out in the law.

Findings on qualification for the yield tax laws. From the restrictions for qualification under the Michigan yield tax laws

¹ Loc. cit.

described briefly above it is obvious that not all of the privately owned commercial forestland in the state would qualify according to present usage. Much of it could qualify if the owners were willing to institute use changes or in some cases rearrange legal descriptions to set apart land which already meets the minimum timber stand requirements.

As a part of this study at the time of the interview, effort was made to ascertain what portion of the commercial forestland in private ownership would qualify under one or the other of the yield tax laws without resorting to shifts in usage. The findings indicated that only 58 percent of the privately owned forestland in the study area qualified under present usage for yield tax listing. Over one-half of the forest area qualified for the commercial yield tax, while only 6 percent of the forest area qualified for the woodlot yield tax.

Under provisions of the commercial yield tax law it is not surprising that only 52 percent of the forest area qualified when one considers the large portion of land held for recreational and other purposes which would disqualify it. It is more significant in view of the large acreage held for farm use that only 6 percent of the forestland qualified for the woodlot yield tax. The 9 percent of

forest area indicated by the sample as listed under the yield tax is undoubtedly high and the result of sampling error.

Owners' attitudes toward yield tax laws. At the time of the interview, questions were also asked to try to shed some light on why more owners did not list their property under the yield tax law. The findings on this question are presented in Table 43. Because of the size of the sample it was impossible to distinguish between the two yield tax laws in Table 43.

Probably the most significant thing brought out by this questioning was that owners of 72 percent of the forest area had never heard of either of the yield tax laws. Owners of a quarter of the forestland had heard of the yield tax, were qualified for it, but had never registered. Their main expressed reason for refusal to register was that they did not think their gain from the tax would warrant the restrictions that would be placed upon them.

About one-fourth of the land owned by those refusing to register was owned by persons who doubted they would gain any tax benefit. This conforms with the findings of an investigation of the Wisconsin forest yield tax law as reported by Wehrwein and Barlowe.¹

¹George S. Wehrwein and Raleigh Barlowe. The forest crop law and private forest taxation in Wisconsin. Wisconsin Conservation Department, Madison, Bulletin 519, Jan. 1945, p. 31.

TABLE 43

ATTITUDES OF OWNERS TOWARD FOREST YIELD TAX
OF OWNERS WHO QUALIFIED FOR LISTING

Owners' Attitudes	Percent of Forest Area
Owners who did not know of yield tax law:	
Showed no interest	32
Showed interest in tax benefits, but did not indicate management practices would be influenced	37
Showed interest in possible tax benefits, and indicated management would be influenced . . .	3
Owners who knew of yield tax law, qualified, but never registered:	
Did not think they would qualify	(a)
Believed restrictions outweighed possible tax benefits	11
Did not believe they would gain tax benefits . . .	6
Did not register because they objected to special privilege taxation on principle	8
Owners who had registered forestland under yield tax law:	
Did not believe their management had been influenced	3
Believed their management had been influenced .	0
Total	100

Also, it conforms with Deitz's¹ findings reporting on an investigation of the Michigan forest yield tax. Deitz found that the yield tax did not always afford owners a tax saving, but that a savings would be effected only under certain conditions. The situations under which the owner would save at present annual general property tax levels were, namely, when he had owned the property a long while before cutting, or when stumpage prices were low. In addition to these reasons for not taking advantage of the yield tax, some large owners interviewed for this study expressed the belief that locally it would be poor public relations for them to use any type of tax advantage.

It would seem that at the 1953 level of the general property tax insufficient tax inducement was offered to cause many owners to go to the trouble required to list their property for the yield tax. However, as long as the law remains on the statute books it is an assurance to concerned owners that high general property taxes will not become a serious burden on their forest ownership. Also, it appears that more advantage would be taken of the yield tax laws if they were better known. Many owners, however, would never be interested in the present yield tax law because their major

¹Warner Deitz. Op. cit., p. 53.

objectives of ownership and use of the property prohibit its being listed.

The Federal Income Tax

In theory the income tax does not have the depleting influence on forest capital that the general property tax has because the income tax incidence is on current income, not future income, which was shown to be the case with the general property tax. The effect of the income tax may be to make the forest suffer, not from overcutting, but from undercutting, because of the owner's belief that all of the proceeds may be taxed away. Since present-day private forestry is suffering more from overcutting than undercutting this influence of the income tax may not appear as a hindrance. However, to the extent that this attitude discourages forest investment among either present owners or prospective owners the income tax can be detrimental to forestry.

Virtually no research has been done heretofore among forest owners concerning the possible influence of the income tax on their forest practices. The yield tax and general property taxes on the other hand are old issues in forestry. Since World War II, particularly, income taxes have dwarfed the importance of the general property tax with respect to the total tax bill of nearly all individuals.

This, coupled with certain special income tax provisions pertaining to income from timber, makes some investigation of the subject quite imperative to forest economics.

The entire concern of this section is with the federal income tax law, even though several states, of which Michigan was not one, had income tax laws as of 1954.

Explanation of the federal income tax law. It is impossible here to delve into a lengthy explanation of the entire federal income tax structure. Just the high points of the laws as they affect forestry will be discussed.

The federal income tax law provides for a levy on net income or net gain at a progressive rate. Separate versions of the law apply to corporate and individual owners. The most important provision of the income tax law with respect to its application are the various ways in which net gain or net income are defined. The most important provisions affecting forestry are those embodied in the 1943 timber capital gains amendment.¹

The advantages embodied in this law for the forestland owner are namely these: He can usually report receipts from sales of

¹ Known as Section 117-K of the Internal Revenue Code or also the Bailey amendment. Since revision of the Internal Revenue Code in 1954 similar provisions are now embodied in Section 631.

timber and timber products as a capital gain rather than ordinary income. Also, he may deduct an allowance for depletion of his investment in the timber which is subtracted from gross income, thereby reducing net income (as defined by the law) and hence taxable income. The advantage of reporting income as capital gains rather than ordinary income is that the tax rate which applies is one-half that applying to ordinary income. Moreover, the maximum rate which applies to capital gains income is 26 percent, whereas that applying to some brackets of ordinary income may be as high as 90 percent or more.

Prior to 1943 it was possible for owners selling stumpage to report that income as capital gains. The 1943 amendment extended this privilege to those owners who harvest their own stumpage provided they assessed a fair market price to the stumpage before harvesting and reported the gain on the stumpage only as the capital gain. In other words, the owner was not permitted to report logging profit as a capital gain; it had to be handled as ordinary income. Both before 1943 and since it has been necessary for the owner to have possessed the timber for at least six months prior to the income-producing sale.

The other major tax advantage forest owners gained through the 1943 amendment was in the way the allowance for depletion was

computed. In essence it permitted owners to charge off depletion (i.e., depreciation of a natural resource) against their capital investment in the standing timber even though the timber may actually have been appreciating in value.

It has been said that the 1943 amendment was justified on two grounds.¹ It would permit those who harvested their own timber the same capital gains treatment as those who sold stumpage and would make private sustained yield forestry investment more attractive to private owners.

Owners' knowledge and use of the federal law. Almost no evidence exists as to how effective the 1943 amendment has been in accomplishing the objectives listed immediately above. According to the testimony of the Forest Industries Committee on Timber Valuation and Taxation,² almost all of the accomplishments of private forestry in the last ten years could be traced to this legislation.

¹ E. T. Williams, M. B. Dickerman, and R. W. Marquis, U.S. Forest Service. Financial and economic factors. Section E, Chapter IV, Timber resource review (preliminary review draft), Sept. 1955, p. 3.

² Forest Industries Committee on Timber Valuation. Statement in opposition to changes in the capital gains treatment accorded income from the cutting or disposal of timber under sections 631 and 272 of H.R. 8300. Before the Senate Finance Committee, 82nd Congress.

They stressed that much industrial forestry progress was incited by placing reliance upon the same type of tax treatment in the future.

It seems logical that forest industries with paid legal advice would take full advantage of any tax break afforded them. A more pertinent question, it would seem, would be to consider all owners in general. How much advantage have they gained from the 1943 amendment? Also: How did they react to ordinary capital gains privileges which have long been available to sellers of stumpage?

In order to throw some light on these questions, forest owners in the study area were quizzed when interviewed concerning their acquaintance with these income tax reporting possibilities. The findings are presented in Table 44.

The most significant thing brought out was that owners of 83 percent of the forest area did not even know that income from the sale of timber stumpage could be reported as capital gains. Respondents to the mail questionnaire to absentee owners, on the other hand, indicated a better realization of this opportunity. This is likely due to a high percentage of business-professional people and a complete absence of farmers in this group of owners.

Owners of less than 3 percent of the forest area knew about these tax reporting privileges, yet failed to take advantage of them when they made a timber sale, while owners of 15 percent of the

TABLE 44

ATTITUDES OF OWNERS TOWARD SPECIAL FEDERAL
INCOME TAX PROVISIONS FOR TIMBER GROWERS

Owners' Attitudes	Percent of Forest Area
Owners who did not know of special tax provisions:	
Showed no interest	34
Showed interest in tax benefits, but did not indicate management practices would be influenced	48
Showed interest in possible tax benefits, and indicated management would be influenced . . .	1
Owners who knew of special tax provisions but never used them:	
Did not know how to make tax calculations	1
Efforts to use them outweighed possible tax benefits	1
Believed they would not gain tax benefit	(a)
Objected to special taxation on principle	0
Owners who had made use of special tax provisions:	
Believed management had not been influenced . .	11
Believed their management had been influenced .	4
Believed their ownership could not have been retained without this tax aid	(a)
Total	100

^a Less than 0.5 percent.

forest area had actually taken advantage of the law. Much of this 15 percent of forest area was accounted for by a few large properties, mostly industrial. Among the owners responding by mail, only 5 percent of the forest area was owned by people who had made use of the law, but over 35 percent was owned by persons who knew about the law yet did not take advantage of it. It seems significant that 27 percent of the area among the mail respondents was owned by persons who did not think they would gain a tax benefit, so did not list timber sale income as capital gains income. Probably these owners were not far wrong in reaching this conclusion, since most of them were small owners and their timber sales brought small returns.

Very few owners among all of those interviewed indicated their management had been much influenced by these tax savings when they had taken advantage of such savings as the law permitted. However, it is probably significant that owners of nearly one-third of the area owned by persons taking advantage of the law did admit that their management had been influenced.

Owners of almost one-half of the area showed interest in possible tax savings even though they had never heard of any of the provisions of these laws before. Most of these owners belonged to the more enlightened occupation classes of owners. This would seem

to indicate that here may be a very fertile field in terms of forestry educational activities.

The lack of interest on the part of many owners seemed to be due mostly to the realization that their prospects for getting much income from their timber was rather remote; either because they did not intend to sell any timber or because they doubted a physical or marketable yield of timber would be forthcoming during their period of tenure. The very fact that large and well-informed owners were quick to defend these tax privileges and invariably took advantage of them seems to indicate that a definite tax savings is effected by the law in the case of this class of owners. The implication here is not that a direct incentive toward better forestry is provided. However, this possible tax saving seems to indicate some encouragement toward forestland acquisition by the larger forest industries which, coupled with the better than average management record of this group, could be construed as an indirect beneficial influence upon forest management.

CHAPTER IX

PUBLIC FORESTRY EDUCATION AND SPECIAL FORESTRY SERVICES

Several special governmental programs with the expressed purpose of fostering better forest practices on private lands are directed toward forestland owners. These programs administered by several different agencies usually are designed to accomplish their objectives through a demonstration type of education or technical on-the-ground assistance.

These methods have been tried and proven in agriculture where they have been so successful that they are the envy of the world. In forestry the same methods are being tried but they are less well proven. As a matter of fact these forestry methods might be looked upon as a great American experiment. They represent an attempt to solve the forestry problem of the United States by some means short of governmental regulation of private forestry.

Very little research has been done to evaluate the effectiveness of these programs at the grass roots. The findings of the study as reported in this chapter represent an effort toward evaluation in a somewhat superficial way.

One study in the eastern United States by Cope¹ did find that publicly sponsored forest owner-education programs were generally not getting at the fundamental problems due to their lack of long-term continuity. The Soil Conservation Service Program was the one found to be accomplishing the most.

In his study of forest farming in Wisconsin and Arkansas, Stoddard² concluded that the public educational and assistance programs to private owners had only scratched the surface. He found that the public programs had been most effective in harvesting and marketing work. His conclusion was that they had been too general to bring about specific action on the ground, or lacked "follow-up" to assure continuity of forest effort by individual owners.

Forestry Extension Demonstration and Advice

The Cooperative Extension Service as it is known today came into being with the passage of the Smith-Lever Act in 1914. Prior to that time all extension work was carried by the states. Prior

¹J. A. Cope. Farm forestry in the eastern United States. Charles Lathrop Pack Forestry Foundation, Washington, 43 pp., 1943.

²Charles H. Stoddard. Forest farming and rural employment, a study of two areas in northern Wisconsin and southwestern Arkansas. Charles Lathrop Pack Forestry Foundation, Washington, 29 pp., 1949.

to 1914 only two states, Michigan and New York, included forestry in their extension programs. After ten years of the Smith-Lever Law, or in 1924, six states had active forestry projects in farm forestry.¹ The record of extension forestry activities for 1924 showed that a total of 1,719 adult demonstrations and 218 junior demonstrations were held in the United States.

The forestry extension program is handled about in the same way, and often jointly with the agricultural extension program in most states. The land grant colleges usually administer the program through a system of county representatives who are responsible for all phases of the program in their county. Technical experts from the colleges are called upon by these county representatives to conduct special meetings in this particular subject matter fields or to answer specialized questions.

Scope and administration of forestry extension. Federal participation with the states in forestry extension was authorized by the Clark-McNary Act of 1924 and as amended in 1949. Section 5 of the act provided for educational assistance to owners of farms

¹ Charles A. Gillett. Aids to farm forestry. A talk presented at the annual meeting of the Society of American Foresters, Minneapolis, Minn., Dec. 17, 1947, p. 2.

"in establishing, renewing, protecting and managing wood lots, shelter belts, windbreaks, and other valuable forest growth, and in harvesting, utilizing and marketing the products thereof."¹ This gave impetus to the program in extension forestry so that by 1947, forty-six states employed sixty-three State Extension Foresters under Section 5 of this law.

The federal funds which only partially pay for the state program are turned over to the agency in the state charged with administering the program. These usually are used to employ one or more forestry extension specialists. In 1953, about ninety extension foresters reported work in 2,709 counties and at a cost of about \$600,000, of which 57 percent was paid by the states, 43 percent by the federal government.

The methods employed in the extension forestry program are many and varied, and include such things as: farm visits, demonstrations, meetings and conferences, workshops, field days and tours, and the use of visual and other informational materials. Probably the most important method the extension foresters use is that of demonstrations. Forestry demonstrations have been conducted on

¹W. K. Williams. Farm forestry extension, what it is and how it works. Extension Service, U.S. Department of Agriculture, Washington, Agriculture Information Bulletin No. 107, Nov. 1953, p. 2.

more than twenty different phases of forestry. The use of visual materials such as bulletins, motion pictures, et cetera, are also important.

During the two years immediately prior to this study, 1952 and 1953, the Cooperative Extension Service of Michigan State College¹ engaged in eleven different types of technical forestry activities within the area encompassed by this study. These included forest tree planting, Christmas tree planting, windbreak and shelterbelt plantings, sugar bush management, woodland management, 4-H Club and school forests, timber estimating and marketing, use of home grown lumber, preservative treatment of wood, farm and home planning, and street and shade tree work. The methods employed by forestry extension personnel in disseminating information in these technical fields are listed in Table 45. This table also summarizes the work done by the forestry extension specialists in the study area for the years 1952 and 1953, and is self-explanatory. This record does not include, of course, help which was given by mail to owners in the study area.

¹From the files of Lester E. Bell, Extension Specialist in Forestry, Cooperative Extension Service, Michigan State University.

TABLE 45
FORESTRY EXTENSION RECORD BY
METHOD EMPLOYED AND YEARS

Method Employed in Study Area	1952	1953
Extension man days spent	83	90
Number of farm visits	123	136
Meetings of extension committee or project and local leaders:		
Number of meetings	8	9
Attendance	198	330
Demonstrations visited	63	109
Meetings at demonstrations:		
Number of meetings	41	53
Attendance	3,587	1,130
Other meetings held in relation to projects:		
Number of meetings	39	43
Attendance	1,663	2,620

Owners' acquaintance with, and use of, forestry extension.

The data presented in this section are based on the field interview, and in some cases supplemented by the mail replies.

Since extension work at the local level is handled by the county agricultural agent (now called county extension director), owners' acquaintance with him is indicative of the use they have made of extension help in general. It was found that 40 percent of the owners holding 25 percent of the forest area did not know their county agent at least by name. Owners of 45 percent of the forest area had previously requested some aid from him.

The acquaintance owners had with the forestry extension program was more restricted than their acquaintance with agricultural extension in general. This is brought out in the following figures on owners' use and knowledge of forestry extension aid and advice:

	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
Did not know forestry extension aid was available	51	82
Knew of availability of extension forestry aid but never applied for it	33	13
Had made use of forestry extension aid	<u>16</u>	<u>5</u>
Total	100	100

If an owner had written to the state college for advice or a bulletin it was considered as having made use of extension assistance.

It is indeed significant that 82 percent of the owners holding more than one-half of the forestland had never heard of forestry extension. When one considers this, however, in view of the less than ninety man days per year spent by forestry extension specialists in the area, it is remarkable that 18 percent of the owners holding about one-half the forestland knew about such assistance.

Owners replying to the mail questionnaire, surprisingly, indicated that they were more familiar with the forestry extension program and that they had made better use of the service (42 percent of the forest area was owned by such persons) than those owners interviewed in the field. This is difficult to explain, particularly in view of the fact that there were no farmers among the mail respondents. Unless the mail respondents deliberately gave misleading answers, one is forced to conclude that this represented a better informed group. All of the findings of this study do point in that direction.

In Table 46 are presented the findings of some more detailed questions asked owners concerning forestry extension. Examination of this table reveals several outstanding points. Owners of 17 percent of the forest area knew about forestry aid but never used it because

TABLE 46

ATTITUDES OF OWNERS TOWARD EXTENSION
FORESTRY DEMONSTRATION AND ADVICE

Owners' Attitudes	Percent of Forest Area
Owners who did not know such aid was available:	
Showed no interest	24
Showed slight interest	23
Showed strong interest	4
Owners who knew of availability of advice but never used it:	
Felt it too difficult to obtain	9
Did not think anything could be gained from it . .	17
Planned to ask for such advice in the future . . .	3
Considered extension valuable but employed or had technical ability themselves	1
Considered extension valuable but used S.C.S or farm forester advice	3
Owners who had made use of such extension aid:	
Doubted technical soundness of advice	0
Believed advice sound but not practical	1
Believed advice good but could not afford to follow it	3
Had followed advice but considered it unsound . .	0
Had followed advice and were uncertain of its soundness	(a)
Had followed advice and considered it sound . . .	12
Total	100

^aLess than 0.5 percent.

they did not think anything could be gained from it. Informal notations made in the field would seem to indicate that this 17 percent was made up of some rather poorly informed owners. Most of the 9 percent of forestland owned by persons who felt it too difficult to obtain extension aid could be attributed to business people who had other heavy demands on their time.

One of the most significant things brought out, it would appear, is that almost four-fifths of the owners who had made use of forestry extension help followed it and considered it sound. This latter figure considered in connection with the high proportion of owners (82 percent) who had never heard of forestry extension, would seem to indicate extension is quite effective among those people reached by it and that considerably more could be accomplished if more personnel and funds were available.

Almost all owners who replied to the mail questionnaire indicating that they had used extension forestry advice indicated that they considered the advice sound.

Another possible indication of the effectiveness of forestry extension activities is brought out in Table 47, where owners' concepts of forest management are compared with the owner's participation in forestry extension. Only casual examination will show that there is a very decided trend toward a higher concept of

TABLE 47

OWNERS' CONCEPTS OF TIMBER MANAGEMENT ACCORDING TO
USE MADE OF FORESTRY EXTENSION

Concept of Management	Use Made of Extension		
	Did Not Know of Forest Extension	Knew About but Never Used Forest Extension	Had Made Use of Forestry Extension
	(percent of forest area)		
No idea	7	0	6
Fire protection or reforesta- tion and/or refraining from cutting	46	29	7
Light cutting and other meas- ures for public good, at some personal sacrifice . .	23	22	7
Light cutting and other meas- ures economically desirable in the long run, but not at present	14	24	10
Light cutting economically de- sirable both in the present and long run	8	23	31
Fire protection and light cutting, economicall desir- able both in the present and long run	2	2	6
High, continuing yield of timber products	0	0	32
Total	100	100	100

management among owners who had made use of extension. Certainly, it can not be implied that this is a cause and effect relationship. Most of the trend is likely attributable to a generally higher degree of enlightenment among owners who are enough concerned to seek such aid.

Farm Forestry Program of the State Conservation Commission

One of the most important of the grass-roots forestry programs offering technical on-the-ground assistance for forest owners is that offered under the Cooperative Forest Management Act of 1950, Public Law 729 of the 81st Congress. This law provides for federal and state cooperation as a means of furnishing this service. How it is provided and how it is accepted by forestland owners is the subject of this section.

This act culminated many years of effort to perfect legislation which would provide adequately for this type of public assistance. The Clark-McNary Act of 1924 set the precedent for state and federal cooperation in forestry. This type of governmental activity in forestry was enlarged upon with the passage in 1937 of the Norris-Doxey Act which provided for actual on-the-ground technical assistance in forestry for farmers.

The Norris-Doxey Act made provision for public assistance in tree planting, farm forestry extension work, farm forestry research, and service assistance in forest management.¹ Work was restricted to farmers and actually began in 1940. Most of the early work under this act was concentrated on a few intensively operated demonstrations. Also, a few cooperating woodland owners were selected for detailed record-keeping. During the war years most of these projects were converted to marketing assistance efforts, thence after the war to management assistance projects entirely.

Scope and administration of the farm forestry program. The Cooperative Forest Management Act became effective in 1951 and repealed the Norris-Doxey Act as of that date. It extended forest management assistance to all private forestland supervisors. No limit as to size of ownership was stipulated, but its services have not been extended to large owners. Control and administration of the act was vested in the states from the beginning. Disbursement of federal funds under the act is to the state foresters or equivalent officials and those employed in the states under the act are state

¹Division of Cooperative Forest Management, Forest Service. Administrative procedures for cooperative forest management act of 1950. Forest Service, USDA, Washington, July 1951, p. 4.

employees. The foresters providing the actual on-the-ground service are called "service foresters."

Michigan cooperates in this program, and as of 1951 employed eight service foresters. These were, however, all located in the southern farming portion of the state. In the portion of the state covered by this study the district foresters of the state conservation commission perform all of the functions of service foresters upon request. The major duties of these foresters and their assistants, however, were those of administrating the state-owned forests in their respective districts. There were eleven such districts in the study area known as Districts 11 through 21. This program, although referred to here as the farm forestry program, is available to all forest owners.

As implied above, no federal funds were used to support private forestry assistance work done by the district foresters in the study area. In this area the ten district foresters spent on the average 8.8 percent of their time on private forestry activities in 1953.¹ In two districts the foresters spent over 27 percent of their time on private forestry, in six districts less than 5 percent.

¹From the files of the Forestry Division, Department of Conservation, State of Michigan, Lansing.

Owners' acquaintance with, and use of, the farm forestry program. In this study in order to provide an evaluation of this type of assistance to forest owners those interviewed were asked questions concerning it. The results of these first questions concerning the farm forestry program were as follows:

	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
Did not know such aid was available	83	97
Knew about the availabil- ity of such aid, qualified, but never applied	8	2
Had made use of such aid	<u>9</u>	<u>1</u>
Total	100	100

It is outstanding that 97 percent of the forest owners representing 83 percent of the forest area did not know they could obtain such help. A comparison of the forest area and forest owner columns indicates that the small owners made less use of the program and were less familiar with it than large owners.

Owners responding to the mail questionnaire indicated a strikingly higher use and acquaintance with the program. Consistently through this study this group of forest owners has indicated that as a whole they were a more enlightened group. Their response is difficult to explain in any other way.

Table 48 indicates in more detail how owners felt about the program. One of the most significant things depicted in this table is that few owners among those who did not know about the program were strongly interested on hearing about it. This would seem to indicate that owners of a very high proportion of Michigan's forestland were not interested in sound technical forestry advice even when provided without charge. No formal attempt was made to learn why owners were so disinterested; however, it appeared from their voluntary testimony that they just did not want any type of governmental participation.

It should be noted, however, that a valid evaluation of owners' disinterest in this or any other relatively new public service is very difficult. A person's opinion may change considerably with respect to a public program after each additional contact with it. The farm forestry program and others treated later in this and the next chapter are comparatively new and hence readers should keep this point in mind.

Of those who knew of the program in farm forestry yet never applied for aid under it, almost none thought it too difficult to obtain.

Separately considering those who had obtained the advice, it is significant that owners representing about six-tenths of the forest

TABLE 48
ATTITUDES OF OWNERS TOWARD SERVICE
ACTIVITIES OF FARM FORESTERS

Owners' Attitudes	Percent of Forest Area
Owners who did not know such service was available:	
Showed no interest	22
Showed slight interest	48
Showed strong interest	13
Owners who knew such service was available, qualified, but never applied:	
Felt it too difficult to obtain on-the-ground aid . . .	(a)
Did not feel anything could be gained from it	3
Expected to apply for aid in the future	3
Considered the aid valuable but had technical competence or employees with technical com- petence	1
Considered aid valuable but had applied for aid from extension forester or S.C.S. farm planner .	1
Owners who had made use of service offered by farm foresters:	
Doubted technical soundness of the advice, hence did not follow it	0
Believed advice technically sound but did not believe it practical	6
Believed advice good but could not afford to follow it	(a)
Previously used such aid, but considered the results unsatisfactory	0
Previously used such aid, but was uncertain it was satisfactory	1
Previously used such aid, and considered it satisfactory	2
Total	100

^a Less than 0.5 percent.

area expressed a belief that the advice given was impractical. This would seem to indicate that the conventional approach employed by technical foresters needs to be altered to meet the needs of the average forest owner. As Stoddard¹ so aptly points out, a basic study in forest owner education is badly needed in this country.

The response from the owners interviewed by mail on the same questions shown in Table 48 indicates a drastically different feeling among this group. Over one-half of the forestland owned by this group was owned by persons indicating that they had used this service previously and considered it satisfactory. Again, their degree of enlightenment appears as the only answer.

Table 49 compares owners' concepts of timber management with their use of the farm forestry service as a measure of the effectiveness on owners of the program. As in the case of the extension forestry program, there is a definite trend toward a higher concept of management among those owners who had availed themselves of the program. Again, it can not be concluded as a cause-and-effect relationship, but it is surely indicative of a higher degree of forestry understanding among those who avail themselves

¹Charles H. Stoddard. Needed: A research program in forest owner education. Journal of Forestry, 48: 339-341, May 1950.

TABLE 49

OWNERS' CONCEPTS OF TIMBER MANAGEMENT ACCORDING
TO USE MADE OF FARM FORESTRY AID

Concept of Management	Use Made of Farm Forestry Aid		
	Did Not Know Farm Forestry Aid was Available	Knew About Farm Forestry Aid but Never Used It	Had Made Use of Aid Offered by Farm Foresters
	(percent of forest area)		
No idea	6	0	6
Fire protection or reforesta- tion and/or refraining from cutting	39	14	4
Light cutting and other meas- ures for public good, at some personal sacrifice . .	21	48	(a)
Light cutting and other meas- ures economically desir- able in the long run, but not at present	20	21	1
Light cutting, economically desirable both in the present and long run	11	11	87
Fire protection and light cutting, economically de- sirable both in the present and long run	3	6	0
High, continuing yield of timber products	0	0	2
Total	100	100	100

^aLess than 0.5 percent.

of such opportunities than among those who are totally ignorant of such things. The well-informed individual is generally the one who seeks this type of advice in the first place but in so doing is very likely to continue to develop his knowledge.

Soil Conservation Service Forestry Program

The Soil Conservation Service as a permanent agency of the Department of Agriculture was established in 1935. Soon afterward the president proposed that each of the states pass enabling legislation which would permit the establishment of soil conservation districts as legal units of government. Ten years after the first state established such legislation all other states had followed the example.

The powers granted the soil conservation districts vary considerably from state to state.¹ For example, only two states grant districts the power to tax. Administrative machinery is also quite different with respect to the ways the districts are administered in the several states. The usual form of administration is through local boards which in turn are controlled by a state committee with authority over such things as state appropriations to the districts.

¹ V. Webster Johnson and Raleigh Barlowe. Op. cit., p. 337.

The Soil Conservation Service has been assigned the job of cooperating with the districts and to assist land occupiers in establishing conservation measures on their lands. Woodlands are given an important place in such activities. Those land owners and occupants who go along with plans proposed for them by the Soil Conservation Service are known as "cooperators." The cooperators are encouraged to: (1) protect woodland from fire and grazing; (2) manage woodlands conservatively and cut timber annually; (3) plant trees on land best suited for woodland.¹

Scope and administration of the Michigan soil conservation districts. The Michigan Soil Conservation District Law was passed in 1937, and later amended. The expressed policy of the act was stated as follows:

It is hereby declared to be the policy of the Legislature to provide for the conservation of the soil and soil resources of this state, and for the control and prevention of soil erosion, and thereby to preserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife, protect the tax base, protect public lands, and protect and promote the health, safety, and general welfare of the people of this State.²

¹ Charles A. Gillett. Ibid., p. 4.

² State Soil Conservation Committee. Michigan soil conservation districts in action, 1951-1952-1953. A Report of the State Soil Conservation Committee, East Lansing, 1954 (pp. unnumbered).

During the fifteen years following passage of the Michigan Act seventy soil conservation districts were established embracing sixty-five of the state's eighty-three counties. Practically all of the counties in the agricultural part of the state have organized districts, and 85 percent of the state's cropland is included in organized districts. In the thirty-one-county area covered by this study (see Figure I) six counties were without organized soil conservation districts in 1954. The counties without districts were: Alcona, Arenac, Crawford, Oceana, Oscoda, and Roscommon. One county in the study area, Gladwin, was just organized into a district in 1953. Five other counties were organized in 1950 or since. Altogether, seventeen counties in the study area are either without organized districts or were organized after the end of World War II. Thus over one-half of the acreage in the study area has scarcely felt the impact of the Soil Conservation Service program at the time this study was made.

For the state as a whole, however, the Soil Conservation Service forestry program has been quite an active one. Forest planting has been one of the most active parts of the program. Through 1952 they were responsible for cooperators planting 62,683 acres of land to trees. Sixteen of the districts had their own nurseries in 1952, and they turned out over three and one-half million trees

that year. Most of the planting effort went into the reforestation of abandoned fields. Some acreage (892 acres) was planted to farm windbreaks.

Another important phase of the forestry program dealt with assisting cooperators to institute improved management practices on existing woodlands. As of the end of 1952, cooperators over the state as a whole had brought 73,275 acres of woodland under this program.

Owners' acquaintance with, and use of, the Soil Conservation Service forestry program. In order to make some measure of the effectiveness of the Soil Conservation Service's forestry program, farmers in the study area were quizzed concerning their reactions to the program. Even though the Soil Conservation Service program is not necessarily limited by law to farmers' lands, to date most of the work has been concentrated on this group.

The emphasis of the program has been on an all-inclusive farm land-use plan in which the woodland generally has an important place. This plan is usually based on the capabilities of the soil with its susceptibility to erosion considered as having the major limiting role. Land considered as being too susceptible to erosion even for grassland use is usually recommended for forest use only. Thus the forest usually has a residual role in the farm land-use plan.

This study indicated farmers who owned one-half of the total forest area owned by farmers had become Soil Conservation Service cooperators.¹ These farmers all had a Soil Conservation Service farm plan written for them at one time or another during their period of tenure. Some of these, however, had ceased to be cooperators for one reason or another. It is interesting to note that when interviewing farmers on this question it was very difficult for them to distinguish what type of help they had received. Very few recognized the various government programs by name.

Soil Conservation Service cooperators who owned forestland were quizzed as to what they thought about the importance of their woodland in the general farm plan. The attitudes determined from this question were as follows:

	<u>Percent of Forest Area</u>
Did not consider woodland to have a significant place in farm plan	32
Considered woodland to have a minor place in farm plan	61
Considered woodland to have an important place in farm plan	<u>7</u>
Total	100

¹ This included all counties, some of which were not in organized districts.

In considering these findings it should be remembered this was a very difficult evaluation to make. Oftentimes cooperators were the owners of better than average farms, and frequently, on such farms, the woodland did have a minor place.

Cooperators who had adopted some forestry practice as a result of recommendations made in the farm plan were asked to name the adopted practice. Only two practices, forest plantations and windbreak plantings, were so named, with plantations accounting for about nine-tenths of the cases and windbreak plantings the balance. Significantly, no cooperators named improvement cuttings in existing woodlands as having been adopted as a result of the plan. In view of the widespread need for such a forestry measure, one is forced to conclude that such a recommendation has had little appeal to farmers and needs to be given special emphasis in any forestry promotional program.

CHAPTER X

OTHER DEVICES TO AFFECT PRIVATE FOREST MANAGEMENT

As the title of this chapter indicates, several different possibilities are considered here which may offer forest owners some inducement to adopt better forest practices. The first of these, benefit payments, is a present reality. Some of the other schemes discussed here exist in a more limited extent.

Forestry Conservation Payments

Beginning in 1936 Congress authorized a program of soil building practices and soil- and water-conserving practices called the Agricultural Conservation Program. As the act was interpreted by the Secretary of Agriculture its primary objective became protection of the public's interest in the nation's soil and water resources. Implementation of the program as authorized by the Congress has been by means of subsidies paid to individual farmers for instituting certain approved practices. These payments were to take the form of cost-sharing with the farm owner.

From the beginning of the program forestry has had a part in it. Forestry's share has, however, been comparatively small,

accounting for less than 1 percent of the payments made over the last ten years.¹

General points on the forestry conservation program. Under the program the approved forestry practices for the country as a whole are tree planting, timber stand improvement work including fencing, and maintaining shelterbelts. Within individual states, however, the practices must be approved by the State Production Marketing Administration Committee. In 1953 payments to the nation's farmers for approved forestry practices amounted to about one million dollars,² most of which was paid for tree planting on some eighty thousand acres. The same year over \$41,000 were paid for tree planting on nearly four thousand acres of land in the study area (Table 50).

In the United States no form of subsidization for forestry on private lands has been employed to the extent it has been in western Europe or Japan. In those sections of the world having similar forest ownership patterns to ours and comparable democratic forms of government, subsidization for the forest owner is common practice.

¹ M. B. Dickerman. Op. cit., p. 4.

² Loc. cit.

TABLE 50

AGRICULTURAL CONSERVATION PROGRAM RECORD
IN THE STUDY AREA, 1950-1953^a

Activity	Year			
	1950	1951	1952	1953
Tree planting:				
Number of counties participating ^b	27	29	30	29
Number of farms participating	1,091	1,357	1,632	1,109
Number of acres on which payment was made	2,974	5,257	5,243	3,987
Average credit per acre allowed for activity . .	\$8.83	\$8.84	\$9.31	\$10.31
Total amount paid	\$26,262	\$46,489	\$48,832	\$41,111
Fencing woodlands:				
Number of counties participating	(c)	(c)	8	4
Number of farms participating			15	14
Number of rods on which payment was made			1,051 ^d	964
Average credit per rod allowed for activity . .			\$0.40	\$0.75
Total amount paid			\$420	\$723

^aFrom the Michigan Office of the Agricultural Conservation Programs, Production Marketing Administration, Lansing.

^bDoes not include counties where money was available but where none was spent. To have included such counties would have added one county in 1952 and 1953, three in 1950, and two in 1951.

^cNo funds were allocated for fencing by the State Committee until 1952.

^dGave protection to 188 acres in 1952.

Often in such countries the subsidization program is carried out along with a strict regulatory program over private forestry with payments made to reimburse owners for practices forced upon them.

Under the program in this country emphasis has been on trying to encourage owners to undertake voluntarily a practice which will benefit both the owners and society in the long run. The payment is justified on the grounds that it is the public's share of the cost of the project in relation to the benefits society will receive from it.

Scope and administration of the forestry conservation program.

It is impossible here to go into a long history of how forestry benefit payments have been handled in this country since the program was first undertaken in the 1930's. Such a discussion would make a long story, and it belongs in the field of forest administration rather than forest economics. It will be the objective here to simply point out briefly how the present system works.

Each year the state committee meets with state farm organizations and obtains their feelings on conservation practices needed for the state. Those that are accepted by that committee are forwarded to Washington to the Agricultural Conservation Program Service. This group then meets with Soil Conservation Service and

Forest Service personnel who work out from these suggestions approved national practices and maximum rates of assistance for which payment might be made. The Secretary of Agriculture then submits the program to the state committee, which selects approved practices for the state from the federal list. Also, the state committee sets maximum payment rates for practices it approves along with detailed specifications on how the practice should be performed. At both the state and federal level the approved practices are weighed in relation to the probable total funds that will be available for the coming year.

Final approval of practices and maximum rates are set by the Agricultural Conservation Program Committees in the counties. Generally, they select the approved practices from those outlined by the state committee in accordance with local needs. However, the county committees do have considerable latitude in even formulating their own practices and rates of payment.

The United States Forest Service is responsible for the technical phases of the forestry practices finally approved by the county committee. This includes assistance in developing specifications for approved practices at the state and county level as well as checking

on compliance with practices at the county level.¹ Actual work on the project is done by the farmer.

The program in the study area. Table 50 shows how active the A.C.P. forestry program has been in the study area for the years 1950 through 1953. For the years 1950 and 1951 tree planting was the only approved forest practice. In 1952 and 1953 woodland fencing was added as an approved practice in a few counties.

These two practices were listed as numbers 20 and 21, respectively, in the 1953 handbook.² Planting trees as windbreaks was included in number 20, and hence is not listed as a separate practice in Table 50. The rates of credit approved for these practices for the state were \$1.00 per one hundred for trees in plantations, \$1.50 for trees in windbreaks. Fencing credit was approved at the rate of 75 cents per rod. Further specifications on protecting the plantings from fire and grazing, et cetera, were spelled out in detail.

¹ Michigan P.M.A. Committee. Agricultural Conservation Program, Michigan. U.S. Department of Agriculture, Production and Marketing Administration, A.C.P. Handbook for 1953, Aug. 1952, p. 12.

² Ibid., p. 20.

Credit per acre in the case of plantings varied considerably from the averages shown in Table 50, depending upon the number of trees planted per acre and variations in the approved rates within counties. For example, in 1953 credit per acre for planting varied from a high of \$15.00 per acre¹ in Otsego County to a low of \$7.75 per acre in Arenac County.

Variation in the number of farms participating, total amount spent, and the number of acres planted also varied considerably by counties within the four-year period. Mason County, with 186 farms participating in 1952, leads in that category. Grand Traverse County, with \$6,770.00 spent in 1952, was the leader in terms of total amount spent. This amount went for planting 677 acres, which was the largest acreage planted by any one county for a particular year. Benzie and Oceana counties ranked high in terms of acreage planted.

In some counties where funds were available for tree planting they were not spent. Roscommon County was particularly lax in this respect by paying only \$10.00 for planting one acre during the four-year period even though funds were available every year.

¹ The high rate for any county during the four-year period was \$20.00 per acre for Crawford County in 1952. The low rate was \$4.50 for Alpena County in 1951.

Findings of the present study. In order to evaluate the attitudes of farm owners toward forestry conservation practices, those interviewed were asked a few basic questions concerning their acquaintance with the program. The results of this questioning in those counties where payments had been available were as follows:

	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
Did not know about the availability of such payments (may or may not have qualified)	59	90
Knew about the availability of such payments, qualified, but never applied	4	3
Knew about availability of such payments, qualified, and had applied for payments	<u>37</u>	<u>7</u>
Total	100	100

The high degree of unawareness about the availability of such aid among farmers is rather astounding. Many farmers who had received other types of A.C.P. benefits did not know of their availability for forestry practices.

The fact that most of the owners who qualified and knew about the benefit payments had applied for them is an indication that such payments were some incentive. Again the indication is

that large farm forest owners were quicker to take advantage of such opportunities than smaller forest owners.

Table 51 gives a more detailed breakdown on farmers' attitudes toward forestry conservation payments. Outstanding is the indication that, of the farmers who had applied for benefits, owners of about one-half of the forest area would not have undertaken the practice without this help. When one considers that there is some reluctance on the part of owners to admit any lack of financial independence the incentive effect of benefit payments becomes more significant.

It is also extraordinary that all of those farmers who qualified but never applied followed this action because they did not think the possible remuneration warranted the trouble.

Among those farmers who had never heard of A.C.P. payments for forestry very few indicated enough interest to say that they might undertake some forest practice under such a cost-sharing scheme. Presumably, these owners might have been interested to the extent of indulging in planting or fencing work they would not have undertaken without payments. A much larger group, owning nearly a fourth of the total farm forest acreage, showed interest in obtaining payments for planting or fencing activities they would have considered doing in any case. Among this latter group, A.C.P.

TABLE 51

ATTITUDES OF FARMERS TOWARD FORESTRY
CONSERVATION PAYMENTS

Farmers' Attitudes	Percent of Forest Area
Farmers who did not know of availability of payments:	
Showed no interest	32
Showed interest but did not indicate practices would be influenced	23
Showed interest and indicated practices would be influenced	4
Farmers who knew about the availability of payments, qualified, but never applied:	
Did not think they would qualify	0
Did not know how to make application for payments	0
Believed trouble of application outweighed possible money benefit	4
Farmers who had applied for payments:	
Stated practices would not have been under- taken without payments	18
Stated practices would have been undertaken regardless of payment	19
Total	100

payments seemingly were not large enough in themselves to tempt adoption of practices eligible for payment, but in considering the adoption of such practices on their own merits, they would have been interested in accepting payments if available.

Forest Cooperatives

Forest cooperatives designed to assist private forestland owners have been popular in many countries having a system of forest ownership similar to ours. This is particularly true in the Scandinavian countries. In this country we have only a relatively few isolated examples. However, many foresters cling to the belief that cooperatives offer great hope for solving our forest problem.

Again it is not possible to delve deeply into the question of forest cooperatives. Much has been written on forest cooperatives, particularly concerning those which have served as working examples, such as the Otsego Cooperative in Cooperstown,¹ New York. Report number 6 from the Reappraisal Report explored the general picture of forest cooperatives in the United States.²

¹James C. Rettie and Frank A. Ineson. Otsego forest products cooperative association, an evaluation. Forest Service, U.S. Department of Agriculture, Washington, Agriculture Information Bulletin No. 17, 42 pp., September 1950.

²R. N. Cunningham, U.S. Forest Service. Forest cooperatives in the United States. U.S. Forest Service, Reappraisal of the Forest Situation, Report 6, 18 pp., 1947.

The basic idea of cooperatives and types of cooperatives.

The idea of cooperatives one might say is as old as that of human society. Basically, the idea is that several persons can, by pooling their resources, improve their economic position through a whole range of activities.

There are many types of forest cooperatives. Cunningham¹ lists five types of cooperatives in forestry, only one of which had much concern with the type of forest management practiced by owner members. Actually, according to Cunningham² the record of forest cooperatives in the United States indicates they have encouraged poor forestry practices probably more often than they have good forestry.

The most popular and successful forest cooperatives in the United States have been of the marketing type. Few have attempted to offer much in the way of a management service along with marketing or other activities. However, according to Cunningham's classification this type of cooperative was the only one which attempted to encourage members to follow desirable forestry practices.

¹ Ibid., p. 2.

² Loc. cit.

The Au Sable Forest Products Association of East Tawas was the only active forest cooperative in the study area. It was a marketing type cooperative organized specifically to market timber products for member producers.

Findings of the present study. The success of any venture in forest cooperatives depends on the attitude of forest owners toward them. In order to measure owners' feelings along these lines at the time of the interview, they were asked if they would be willing to join other owners in the same area in a cooperative which would hire a forester to jointly manage their forest properties and to handle the marketing of timber produced thereon. Some 99 percent of the owners of 98 percent of the forest area stated flatly that they would not be interested.

As discouraging as this may sound, it should be remembered that cooperatives require considerable promotional effort in the initial stages.¹ They then become their own advertisers.

Forest Management Contracts

The forest management contract represents a relatively new innovation for solving the forestry problem on small private properties.

¹James C. Rettie and Frank A. Ineson. Op. cit., p. 42.

Some examples can be found in the South which have existed for as long as ten years. In other sections of the country the idea is less tried. Only one example of this type was noted in the study area.

The idea behind management contracts. Forest management contracts basically involve many of the same principles as cooperatives; i.e., that they represent a pooled type of effort. Their main objective is to overcome the diseconomies associated with the management of small forest properties by grouping several small properties together under one management and thus make possible the establishment of a sustained-yield working unit.

Generally, projects of this type are initiated by private forest management consultants who enter into an agreement with several small forestland owners to manage their lands for them. The management service as generally conceived includes a marketing service which enables owners to obtain better prices for their timber than would be possible for them selling individually. Also, a part of the management service includes the handling of the timberland.

Many different arrangements under such a plan are possible, particularly with respect to the costs and payments. The Tennessee Valley Authority's Forestry Division has done considerable work in

trying to promote good forestry on private lands by means of a management contract. They summarize the requirements of a good contract as follows:¹

From the land owner's standpoint:

1. The contract must provide for timber stand improvement, restocking, and steadily increasing production capacity at no out-of-pocket expense to the owner.
2. The owner must be insured against liquidation of his forest capital through overcutting.
3. The owner must have an option to cancel the contract on reasonable notice without undue sacrifice.

From the forest manager's standpoint:

1. He must have a reasonably free hand in developing and managing the woodland as a sound and profitable long-term business enterprise.
2. In addition to compensation for operating the timberland, he must also be assured of an interest in the increased and improved stand resulting from the application of his management skills. The contract must provide for valuation of his interest and equitable compensation.

It is entirely possible that arrangements along these lines will prove more successful on the American scene than forest co-operatives because such arrangements seem to tie in closer with our generally accepted institutions of business and private property.

Findings of the present study. The success of a venture of this type will depend upon how readily it is accepted by forestland

¹ Tennessee Valley Authority. A long-term forest management contract. Tennessee Valley Authority, Norris, Tenn., Feb. 1955, p. 2.

owners. In order to determine this, interviewed owners were asked their reaction to such a plan.

Owners were asked their attitude toward using the services of a forester to manage their forest property under good forestry practices at a cost not to exceed 20 percent of the gross stumpage value. The results were as follows:

	<u>Percent of Forest Area</u>	<u>Percent of Forest Owners</u>
Not interested	70	96
Interested	<u>30</u>	<u>4</u>
Total	100	100

The same question analyzed from the mail questionnaire showed that owners of 86 percent of the forest area were not interested.

The fact that owners of three-tenths of the forest expressed interest in such a plan is an indication that this type of enterprise might meet with a fair degree of initial success in the study area. Many of the interested persons were owners of large acreages used for hunting purposes. Frequently, too, they were persons who lived too far from the land to handle it effectively themselves.

Interest in forest management contracts also differed with respect to occupation classes. Farmers generally showed a lack of interest. When the above analysis was performed, omitting both

farmer classes, area owned by persons interested increased to 38 percent.

Comparison of owners' attitudes toward this question with the attitudes displayed toward cooperatives seems to lend evidence to the writer's opinion that the management contract scheme blends better with American institutions.

Forest Credit

Forest credit has long been advocated by forest economists as a means of reducing the pressure for forest owners to liquidate their timber capital in times of personal financial stress. Williams, Dickerman, and Marquis¹ state:

If timber is to be grown in adequate supply for future needs, and if the quality of forest products is to be improved, timber growers must have access to adequate risk capital and credit.

The concept of forest credit and present programs. Though forest credit has long been advocated, it has been slow in becoming a reality in forestry. One reason for this has been due to the long production period required for forest crops in relation to the high rate of interest generally expected on commercial loans. Under

¹E. T. Williams, M. B. Dickerman, and R. W. Marquis.
Op. cit., p. 8.

such circumstances interest costs would nullify any possibility of growing timber profitably on borrowed capital. Another important reason for a lagging credit program in forestry has been due to the high risk involved and the lack of an insurance program for minimizing it.

As mentioned above, generally forestry credit is seen as a means of avoiding forced liquidation. It is possible, however, that the effect could be exactly opposite. Ciriacy-Wantrup¹ points out that the credit system may discourage conservation: first, through instability of tenure (i.e., owners realizing they were unable to pay back a loan might liquidate their forest capital before foreclosure); and secondly, through fixed interest and amortization payments (i.e., owners might be forced to liquidate forest capital to meet these fixed charges).

Forest credit, even on a short-term basis, was hampered until recently by national banking laws which prohibited national banks from lending on unimproved real estate, timberland included. In 1953, Congress amended the law so that loans up to ten years with prescribed amortization are now legal.

¹S. V. Ciriacy-Wantrup. Op. cit., p. 162.

Some progress toward long-term low-rate credit has been achieved. Federal land banks have made some timber loans with terms up to forty years. As of 1955 the total amount of such loans outstanding was reported at over six million dollars.¹ The Bankhead-Jones Act of 1937 also authorized the Farm Security Administration to lend farmers money at low rates for windbreaks, woodland improvement, and tree farms. Not a great deal has been loaned under this act.

Findings of the present study. Forest owners' opinions on forest credit are important for two particular reasons. One is that unless forest owners were willing to use forest credit it would be of no help even if it were available. The other is that, assuming low-cost government credit is needed, forest owners could exert the pressure needed to make it a reality.

At the time of the interview forest owners were asked if they had ever given previous thought to low-rate forest credit. Owners of only 6 percent of the forest area said they had; the balance said they had not.

¹E. T. Williams, M. B. Dickerman, and R. W. Marquis.
Op. cit., p. 8.

Owners were also asked if they would be willing to borrow money on their forestland in order to improve it if such credit were available and if it could be secured by the timber alone; i.e., without the owner risking any other assets. The analysis of the answers to this question appears in Table 52. The analysis of the mail questionnaire performed separately yielded about the same results.

Owners' general lack of interest in forest credit is quite evident from examination of Table 52. However, the fact that owners possessing 96 percent of the forestland had given no previous thought to forest credit tended to guarantee the lack of enthusiasm owners expressed toward borrowing on forestland.

It is interesting to note that large owners showed more interest in forest credit than small owners. Although in the study area this higher degree of interest by large owners can not be attributed to the response of large forest industry owners, it should be mentioned that presumably they are the group most likely to be motivated by the availability of forest credit.

No formal effort was made in this study to determine why owners were so completely disinterested in forest credit. However, it was noted that most owners thought low-rate forest credit

TABLE 52

OWNERS' ATTITUDES TOWARD BORROWING UNDER A SYSTEM
OF FOREST CREDIT IF CREDIT WERE READILY
AVAILABLE ON A LONG-TERM,
LOW-COST BASIS

Owners' Attitudes	Percent of Forest Area	Percent of Forest Owners
Not interested	80	93
Mildly interested	16	7
Strongly interested	4	(a)
Total	100	100

^aLess than 0.5 percent.

sounded like a good idea. Many interviewees were quick to express a general distaste for borrowing on general principles.

CHAPTER XI

SUMMARY AND CONCLUSIONS

This thesis has explored what appear to be the most important relationships between private ownership of forestland and the management of the forest resource. It is the objective of this chapter to summarize and interrelate the important findings of the study, to evaluate policy approaches touched upon by the study, and to point out further research that seems to be needed.

Findings of This Study¹

This section attempts to summarize rather briefly the most significant findings of the study. For the convenience of the reader the order of summarization closely follows that of the complete text. This discussion begins with the findings of Chapter IV. No attempt is made here to summarize the methods employed in making the study, inasmuch as Chapter III already represents a digestion of

¹ All statements in this section concerning forest area refer to privately owned commercial forest acreage in the study area unless otherwise specified.

those techniques and it was felt that any effort to reduce this material further would probably only serve to confuse the reader.

Owners of the forest resource. For purposes of studying private forestland ownership in the northern portion of Michigan's Lower Peninsula it was found convenient to group owners into occupation classes, eleven finally being retained as significant. These classes were: forest industry, nonforest industry, farmer, part-time farmer, business-professional, wage earner, housewife-widow, recreational group, real estate, undivided estate, and retired.

Of the 7.5 million acres of commercial forest in the thirty-one-county study area, 4.9 million acres were privately owned. Among the eleven owner classes the farm class was the largest, and held over one million acres, or slightly over one-fifth of the total privately owned commercial forest. Farmers and part-time farmers combined owned three-tenths of the total.

The business-professional class was the second largest single owner class. Recreational groups ranked third, and owned about 13 percent of the commercial forest. At the lower end of the ranking was the forest industry group, with about 2 percent of the privately owned commercial forest area. The nonforest industry group outranked forest industries better than two to one.

The proportion of forest area held by occupation classes differed from sector to sector in the study area. Among the five survey blocks (Figure I), farmers led in three, business-professional people in one, and recreational groups in the other.

In terms of commercial forest acreage by stand-size class, recreation groups had the smallest proportion and farmers had the largest proportion of their forest acreage in large saw-timber stands. Retired people held a larger proportion of their acreage in poorly stocked stands than any other group.

Business-professional people and recreational groups stood out as proportionately large owners of the area in the coniferous forest type. The business-professional class held a significantly large proportion of the aspen type, while farmers held a higher proportion of their acreage in the northern hardwood type than any other group.

Much of the forest was held by absentee owners. Only 29 percent of the privately owned commercial forest acreage in the study area was held by resident owners. Some 37 percent of the forest was owned by persons living further than one hundred miles away. Real estate people, wage earners, business-professional

persons, and particularly recreation groups were characteristically absentee owners, while farmers were usually resident owners.

The distribution of timber volumes among the several owner occupation classes was similar to that for forest areas. A few additional points stood out, however. Farmers had a higher proportion of the volume they owned in saw-log material than any other owner class, while the other classes ranked rather equally on that particular score. Most of the farmer-owned saw-log volume, however, was in hardwoods other than aspen.

Recreation groups held a higher proportion of softwood saw-log and cordwood volume than any other owner class. Business-professional people held the highest proportion of the total volume in aspen.

In terms of average size of forest holding, nonforest industries far outranked any other class. Forest industries, recreation groups, real estate people, and undivided estates all ranked above the average with respect to size of forest holding, while the two farmer groups and wage earners ranked low.

Some background information about forest owners. About three-fourths of the forestland in the study area was procured by present owners through purchase. Most of the balance had been

obtained through inheritance. Purchase was the leading method of forest acquisition by all owner classes except farmers, who acquired slightly over one-half of theirs by inheritance. Foreclosure and gift were found to be insignificant means of transferring forest property. Large forest properties were transferred by inheritance more often than small properties.

Ownership of forestland in the study area was found to be rather stable. Some 30 percent of the forest had been held over twenty-five years, three-fourths over nine years. Definite peaks could be noticed in the history of land acquisition activity that appeared associated with the business cycle.

Length of tenure analyzed by occupation groups showed some striking differences. Nonforest industries had held their land longer than any other group. Forest industries were comparative late-comers. Recreational groups had acquired most of their holdings during two distinct periods.

Stability of tenure of family-held forestland was found to be the exception in the study area. About three-fifths of the land had not been held by the family prior to the present generation. Also, few family owners expected to retain the forest in family ownership an additional generation.

Most of the forestland (82 percent) was owned by persons past forty years of age. Also, older owners held forest properties of a larger average size than younger owners.

In terms of objective of forest ownership, much of the forest (31 percent) was held for farm usage. Another 37 percent was held for recreation or residence and investment or speculation. Other objectives of ownership failed to rank very high.

Sale of mature timber ranked highest as an objective of ownership in the business-professional and housewife-widow groups. Recreation as an objective of ownership ranked first in only one occupation class. Other objectives were about equally distributed among owner classes or else they were grouped as one would logically expect; e.g., farmers were holding mainly for farm usage.

Some aspects of forest management. In the study area it was found that 80 percent of the forest area was handled directly by the forest owners, 19 percent by managers, and only 1 percent by tenants. Industrial owners usually delegated their forest managerial responsibilities to managers. About four-tenths of the recreation group and business-professional forest holdings were handled by managers.

Less than one-half of the forestland was found to be grazed by domestic livestock. Most of this was accounted for by the farmer groups.

Owners of nearly one-half of the forest had made no commercial timber cut during their tenure of ownership, indicating little return was being obtained from the forest resource. On the other hand, close to one-half of the forest area was owned by persons who had sold some timber during the last five years.

Very little of the forest area from which commercial harvests were made was supervised by a professional forester. However, owners holding nearly three-fourths of the forest area claimed that cutting on their lands had been supervised either by themselves or their representative. Nonforest industry owners had the best record with respect to control of cutting, while wage earners had about the poorest. Recreation group owners hired the services of professional foresters more frequently than any class except industrial owners.

Some three-fifths of the forest owners, holding 46 percent of the forest area, were practicing poor cutting on their lands. On the basis of broad occupational groups, farmers and part-time farmers were found to have practiced the poorest cutting, and industry owners the best.

Absentee owners appeared to have had poorer cutting practices on their land than resident owners. Also, properties handled by managers apparently had better cutting practices than those handled by the owners themselves.

Cutting practices also appeared to vary with respect to the age of the owner. Owners in the forty to fifty year age bracket appeared to have been practicing the best cutting.

No conclusive correlation was observed between length of tenure and cutting practice. Properties which had been in the same family one or more generations did, however, have poorer cutting practices than those acquired during the tenure of the present owner. Also, owners expecting to bequeath ownership to their direct heir appeared to have been practicing better cutting than those without such plans.

Observations on class of cutting practice according to objective of ownership revealed that owners with objectives usually associated with farming had poor management, while those whose objectives were associated with industrial ownership had good management.

Attitudes of owners toward forest management. When forest owners were rated according to their concept of management, less

than 1 percent of them, who held 5 percent of the forest area, rated at the top of the scale. About an equal portion of the forest area was owned by persons who had almost no concept of forest management. Most owners tended to think of forestry largely in terms of fire protection and refraining from cutting.

In ranking owner occupation classes according to their concept of management, the two farmer classes, wage earners, undivided estates, and retired persons were at the bottom of the scale. The business-professional, housewife-widow, and recreational classes ranked rather high.

Over two-fifths of the owners of about an equal portion of the forestland realized that it would be physically possible for them to improve their forest management. By far the most important reason these owners gave for thinking their management was poor could be stated as "inability to supervise because of physical limitations or demands of a more remunerative activity." Some reasons commonly believed to account for poor management, such as "immediate need of liquidating timber for cash," ranked very low as an explanation for poor management.

Forest taxation. Most of the forestland in the study area was being taxed at between 10 and 14 cents per acre. Nearly

nine-tenths of the forestland was taxed at less than 25 cents per acre. There seemed to be some tendency for absentee owners to have higher per acre forest taxes than resident owners.

Investigation relative to the qualification of properties for the Michigan forest yield tax showed that only 58 percent of the forestland measured up to minimum standards prescribed by the law. Little forest acreage was found to qualify for the woodlot yield tax. Most of the land that qualified met the standards for the commercial yield tax.

Few properties were encountered that were registered under the yield tax. Also, owners holding 72 percent of the forest area had never heard of the yield tax. Very few of the owners interviewed indicated much interest in taking advantage of the yield tax. Most of those who did show an interest in the law did not indicate that their management would be influenced by it.

Questions asked owners concerning provisions in the federal income tax law which related to forestry indicated that very few owners even realized that timber sale income could be reported as capital gains. Most of those who did know about this law were large owners. There was little indication that this tax law had influenced forest management.

Public forestry education and special forestry services. Forestry extension activities were not well known by forestland owners. About four-fifths of the owners holding over one-half of the forestland had never heard about the availability of forestry extension. Most of the owners who had used forestry extension advice rated it quite highly. Most of the owners who had heard of forestry extension, but had not taken advantage of it, doubted if they could profit from it. Owners who had used forestry extension appeared to have a higher concept of forest management than other owners.

The farm forestry activities of the State Conservation Commission in the study area were less well known than forestry extension services. Some 97 percent of the owners holding 83 percent of the forest area were not acquainted with the program. A significantly large portion of those owners who had secured farm forestry assistance indicated that they believed the advice impractical. Those owners who knew about the program rated higher in their concept of management than those less familiar with the service.

The Soil Conservation Service forestry program among farmers was found to be fairly well known. Farmers who owned one-half of the total forest area owned by farmers had become S.C.S.

cooperators. Very few of these cooperators, however, considered the woodland to have a major place in the farm plan.

Other devices to affect private forest management. Forestry benefit payments have been available for tree planting and fencing activities in the study area for several years. These payments for tree planting made in 1953 amounted to over \$41 thousand. However, nine-tenths of the farm owners holding three-fifths of the farm forest area had never heard of the program. Nevertheless, among the farm owners who had applied for payments for forestry work, owners of about one-half of the forest area indicated they would not have undertaken the practice without this help.

Among the several other devices designed to aid private forestry, forest management contracts got the most favorable reaction from forest owners. Response to none of the programs suggested to owners could be considered as enthusiastic, however. Some 4 percent of the owners holding three-tenths of the forest area indicated an interest in forest management contracts. Only 1 percent of the owners of 2 percent of the forest area appeared interested in a possible forest cooperative. Also, 93 percent of the owners holding four-fifths of the forest indicated they were not interested in a low-cost forest credit scheme. However, few owners had done

any previous thinking about plans of this nature, and hence this may have accounted for much of the lack of enthusiasm.

Owner Occupation Class Comparisons

In addition to the items already mentioned in the summary and in the text, several points with respect to owner classes need to be brought out inasmuch as they transcend the several separate subject area considerations employed in the study.

Industrial owner classes. The forest industry class was seen to be rather insignificant in the study area in terms of the forest resource they owned. Aside from one large owner, this class was composed of a mixed group of small forest industries whose owners were fully as heterogeneous as those in any other class. Very few of these owners appeared to have had the resources or inclinations to move into sustained-yield forest programs. Most of the relatively good showing made by this group is attributable to the influence one large owner had in the sample.

The nonforest industry class represented several types of industries, many of whom had little or no interest in forest management. One industry with a genuine interest in forestry for watershed purposes dominated this class in the sample and accounted

for most of the high ranking attained by the group. This was a class with ample financial resources which some were willing to spend on forestry measures without pressure for immediate returns.

Farmer owner classes. The farmer class was shown to be the largest single class composed of many small owners with rather divergent attitudes. On most of the ratings employed in this study, farmers were found scattered over the entire scale. Most of the uniformity observed within this class regarding attitudes and actions toward the forest appeared to have been associated with either the farmer's age or his income position. Farmers did more of their own timber cutting than any other occupation group, and they were the targets for more of the governmental assistance programs than any other single class.

Part-time farmers resembled farmers in most respects explained above. However, they differed from farmers mainly in that they had income from sources other than farming. Also, often their prime interest in the farm was as a place of residence. Their farm units often contained a much smaller portion of tilled land than full-time farmers. Generally, part-time farmers were too busy with other pursuits to concern themselves with government assistance programs. This was not a well enlightened class of owners.

Other owner classes. The business-professional class was the most enlightened one in this study. In many respects this was a group with very uniform attitudes toward the forest. Differences in attitudes within this group seemed to be associated more with their distance from the property and method of acquisition than anything else. Generally they were quite eager to learn more about the forest and appeared willing to invest moderate amounts in their forest providing they were convinced it could be a paying investment.

Wage earners were similar to part-time farmers in their outlook toward the forest and their economic position. This group was least uniform with respect to the reasons they had acquired ownership of the land. Often their intentions toward the forest were good, but other demands on their time and financial resources made accomplishments rather small.

The housewife-widow group resembled the retired owner class in that they were very inactive in their exercise of the rights of ownership. When these owners did practice good forestry it was usually involuntary. They had little in the way of plans for their forests.

Recreation groups were usually large owners, and their objectives of ownership resembled those had by many members of the business-professional class. Members of this class were strongly

against devastating forest practices, but their organization structure often made it difficult for them to initiate forestry production programs. Group members were usually either wage earners or businessmen.

The real estate class was one based primarily upon objective of ownership which tended to place the owner into this separate business class. This group differed within itself mainly in the haste individual members exhibited for disposing of their holdings. The group had little in common with the other classes employed here. Their actions, however, were strongly influenced by the way they anticipated the views of prospective customers.

The undivided estate class had little in common with other classes excepting the real estate class. Estate administrators were usually less concerned about future owners than was the case with real estate dealers. Attitudes toward the forest were difficult to relate to this class. Mainly, it was a class of property in a state of transition.

Retired forest owners constituted a very mixed group whose members had attitudes that tended to fit with those of their former occupation class. In many respects the class as a whole resembled the housewife-widow class in their actions toward the forest. Generally their forest action programs, if any, were the result of default.

Policies implied by owner class differences. When the differences outlined above with respect to the various occupational classes are considered in view of the differences already summarized earlier in this chapter in terms of how the separate owner classes treat their forest, certain policy changes seem to suggest themselves. The ways in which the individual owner classes differ as to cutting practices and points of ownership have not been repeated here since they were summarized in the first section of this chapter and particularly emphasized in the text.

The farmer classes were seen to have a rather poor record of forest management, and also possessed relatively low concepts of forestry despite the fact that more public educational effort and assistance has been expended on them than any other class of owners. This difficulty may be the fault of farmers themselves or due to confusion at the grass-roots level among the programs designed to help them. If the former is the case, a shift in present programs to more enlightened owner classes could result in greater accomplishments. If the latter is the case, an administrative consolidation of the several forestry programs is called for.

Differences in average size of forest holding among occupation classes and differences in owner class concepts of management imply suggestions in terms of the accomplishments of policy programs per

dollar of funds expended. If public policy is more concerned about the welfare of forestry than forest owners, more might be accomplished by concentrating public programs on business-professional owners, for example.

Evaluation of Policy Programs

Policy programs were discussed in Chapters VIII through X, and included such things as taxation, education, special assistance, benefit payments, management contracts, cooperatives, and credit. This section attempts to evaluate those programs with respect to possible changes in policy which were suggested by the findings of this study.

Forest taxation. The study indicated that the annual general property taxes offered no particular obstacles to forest ownership. Due to the fifteen-mill tax limitation and efficient equalization, little dispersion was noted in tax rates per acre. It did appear, however, that there may have been some tax discrimination against absentee owners, which suggests that this point ought to be considered by tax equalization officials.

Forest yield taxes appeared to be offering little encouragement toward the practice of better forestry in the study area, mainly

due to present low property tax rates. Indications are, however, that interest in yield taxes in the state as a whole has increased recently due to land acquisition activities of some large forest industries. This study has shown that if Michigan's yield tax laws are to perform the functions for which they were originally designed some legal changes are needed to enable more properties to qualify under the law. This is particularly true with respect to the woodlot yield tax. Both the woodlot yield tax law and the commercial yield tax law appeared to be poorly administered; however, consideration of those problems lies beyond the scope of this thesis. Nevertheless, this study has shown that few land owners knew about Michigan's forest yield tax and that some improvement along these lines of owner education is needed.

Federal income tax provisions which apply to the reporting of income from timber sales also were poorly understood by forest owners. Some educational work among forest owners relative to this law also appears to be needed. At the level of understanding of the law which existed when the study was made, it was difficult to draw conclusions as to its effect on forest owners. Although definite tax savings are possible under this law, it appeared that small owners with infrequent incomes from timber did not stand to benefit enough to become very much concerned about it.

Public forestry education and special forestry services. Forestry extension, although unknown to owners holding more than one-half of the forest area, appeared to have been quite effective as a means of educating forest owners. In terms of the expenditure on forestry education within the study area it also appeared to have been a very efficient program. The findings of this study certainly seem to suggest that more funds are justified for this program. It is beyond the scope of this study to suggest how far such expansion should be pushed or how it could best be effected administratively. It would seem that expansion should be gradual, and periodic evaluations should be made relative to increases in the effectiveness of the program.

The farm forestry program of the State Conservation Commission is a relatively new program in comparison with forestry extension. Also, the foresters responsible for carrying out the program in the study area had other important duties assigned to them. For these reasons it is difficult to conclude the program to be ineffective despite the fact that few forest owners realized the service was available to them. However, the high portion of forest owners who stated the advice given them was impractical can not be ignored. One is forced to conclude that the recommendations which are being used should be studied and possibly tempered to better fit the private

forest owner. It may well be that the program should be divorced entirely from the forestry work on state lands.

The Soil Conservation Service's forestry program appeared to have been quite effective in that it reached a high portion of the forestland held by farmers. However, it appears that the program recommendations have not been well balanced in that they have placed too much emphasis on tree planting. The program should be studied in an effort to determine whether or not the total accomplishments of the program would be affected by shifting some emphasis from tree planting to timber stand improvement work.

Other devices to affect private forest management. The forestry conservation payments program is of particular interest in forest policy because it is virtually the only subsidy program in American forestry even though it is restricted to farmers. On the basis of the findings of this study, one must conclude that the program was effective in promoting forest planting in particular. Also, the fact that almost all of the funds allocated for this work were used each year leads to the conclusion that more funds could be effectively used in the program. There seems little doubt but what a considerable expansion of the program to additional classes of owners would result in additional accomplishments without increasing per unit costs.

The idea of a forest management and marketing cooperative had so little appeal to forest owners that one must conclude the promotion of the idea would be futile in the study area. Likewise, the history of forest cooperatives in the United States is not bright. These factors suggest that regardless of the soundness of the idea of forest cooperatives their chances of success are quite dim.

Forest management contracts had sufficient appeal, particularly among larger owners, to allow one to conclude that their chances of success were quite bright as a promoter of good forestry practices. The most appealing thing about this type of scheme was its conformity with conventional American business procedures.

Forest owners' reactions toward suggested forestry credit schemes were conclusively negative among the types of owners found in the study area. This evidence appears to suggest forest credit schemes would have little chance of success among small individual owners, and hence should be directed toward large forest industry owners.

Suggestions for Further Research

Forest ownership studies of this type can not lead to definite answers about the economics of forest production. Rather, they should be looked upon as a necessary preliminary step to further

effective research into the economics of forest management in a given area.¹ Such studies provide the necessary factual background about forest ownership before any action programs can be undertaken. Also, they provide a good means for gauging the forest economic research needs of a locality. A few of the most important of such local and general research needs as the author now sees them are mentioned below.

The most need seems to call for a fundamental type of study concerning the motivations of private forest owners. Forest economists in the past have tried to explain owner actions in terms of the theory of the economics of the firm. This may explain the behavior of industrial owners, but with the present means the economist has for measuring the intangible values of the forest, economic theory is limited in explaining the actions of most forest owners. This is particularly true for nonfarm owners. Even in the case of farmers whose actions can be explained fairly well in agricultural production by economic theory, forestry appears to be an exceptional enterprise. The author believes that a psychological study of owners' attitudes and behavior might make the contribution needed to fill this void.

¹ Solon Barraclough. Op. cit., p. 261.

Some of the situation as described above can be explained by ignorance of forest owners as to the productive potential of the forest. Even if forestry education were 100 percent efficient with present knowledge the owner would not be informed as he would like to be. Forest economics is particularly deficient with respect to input-output data on forest production. This is not something that can be answered by a short-run research project. It will never be answered unless properly designed long-term studies are instituted. Thus far, few studies of the proper design have been launched.

Assuming that the results of both phases of research mentioned above will be forthcoming, more research will be needed concerning forest owner education. It seems that what is needed first is an evaluation of our present position on the marginal revenue and marginal cost curves. The same type of information is needed for benefit payment programs. The writer has the feeling that, as of the present status of such programs, marginal increases in expenditure would result in increasing marginal results (i.e., returns).

Many other research possibilities are suggested by this study. However, none of the others appear to rank near those listed above, either fundamentally or generally. Locally, some others might rank rather high.

APPENDIXES

APPENDIX A

Definition of Terms Employed in This Study

Commercial Forest Types¹

Forest type. A forest stand characterized by the predominance of one or more key species, which make up 50 percent or more the sawlog volume in sawtimber stands; of the cordwood volume in poletimber stands; or of the number of trees in seedling and sapling stands.

White pine type. A stand in which pine species predominate, with white pine the most common.

Red pine type. A stand in which pine species predominate with red (Norway) pine the most common.

Jack pine type. A stand in which pine species predominate, with jack pine the most common.

Spruce-Balsam fir type. A mixed hardwood-coniferous stand, with white spruce and balsam fir the key species.

Black spruce type. A stand in which swamp conifers predominate, with black spruce the most common.

Tamarack type. A stand in which swamp conifers predominate, with tamarack the most common.

Cedar type. A stand in which swamp conifers predominate, with cedar the most common.

Northern hardwood type. A stand in which northern-hardwood species (sugar and red maple, yellow birch and basswood) predominate.

Oak type. A stand in which the oak and hickory species predominate.

¹ Lake States Forest Experiment Station, Forest types and conditions classes in the Lake States. U.S. Forest Service. Lake States Forest Experiment Station, Miscellaneous Report No. 2, June, 1948. 7 pp.

Ash-elm type. A stand on overflow or poorly drained land, in which bottom-land hardwood species, such as ash, elm, and associated wet-land hardwoods predominate.

Aspen type. A stand in which a mixture of trembling or large-tooth aspen, balsam poplar (Balm of Gilead), and paper birch predominate.

Upland grass-brush type. Upland grass, weed, or brush area in the forest (not prairie) less than 10 percent stocked with commercial tree species.

Lowland brush type. Lowland brush on potentially commercial forestland, less than 10 percent stocked with commercial tree species.

Stand-Size Classes¹

Saw-timber stands. Stands of timber large enough and in sufficient quantity for sawlog operations according to regional practice. They must have at least 1,500 board feet, International 1/4-inch rule (1,300 Scribner Decimal C.), net merchantable volume per acre in saw-timber trees. Saw-timber trees of softwood species are 9.0 inches or larger d.b.h., and of hardwood species (including aspen), 11.00 inches and larger d.b.h., containing at least one merchantable 8-foot log.

Large saw-timber stands. Stands of saw-timber having more than 50 percent of net board-foot volume in large saw-timber trees, i.e., 15.0 inches and larger d.b.h.

Small saw-timber stands. Stands of saw-timber having half or more of their net board-foot volume in trees less than 15.0 inches d.b.h.

Pole timber stands. Stands made up principally of trees from 5 to 9 inches d.b.h. (5 to 11 in the case of hardwoods) which are

¹ Loc. cit.

at least 10 percent stocked. They must have a volume of at least three cords per acre of sound merchantable timber, with half of it in pole-size trees.

Seedling and sapling stands. Stands made up principally of seedlings (1 foot high to 0.9 inches d.b.h. with at least 200 stems per acre) and saplings (1.0 inch d.b.h. to minimum for pole-timber size and occupying at least 10 percent of the growing space) and lacking sufficient merchantable volume to qualify as pole timber or saw timber.

Nonstocked stands. Stands with less than 10 percent of full density. They are synonymous with the upland grass-brush type or lowland brush type stands.

Owner Occupation Classes

Lumber company. An individual or company engaged in the manufacture of sawn lumber from logs as a full-time pursuit. It excludes businesses engaged in the resale of lumber only.

Pulp or paper company. A company engaged in the manufacture of wood pulp or wood pulp and paper products from raw wood material in the round form.

Part-time sawmill operator. An individual business or company devoting only a portion of its resources and management to the manufacture of sawn lumber from logs. The remainder of its effort may be engaged in any type of business or occupation. The part-time activity that fits this category takes precedent over any other classification possibility.

Other forest industry. A firm engaged in the manufacture of products other than wood pulp or lumber from round wood material.

Dealer in forest products. A person or firm engaged in the buying and selling of raw timber products in the round form, such as pulpwood, etc.

Nonforest industry. An industrial owner (not necessarily a manufacturer) not using wood as a basic raw material, such as a power company, a gas or oil company, a mining company, etc.

Farmer. A person engaged in farming as his major occupation. He must devote at least three-fourths of his working time to farming.

Part-time farmer. A person who farms as a sideline to other pursuits devoting less than three-fourths of his working time to farming. The part-time activity that fits this category takes precedent over any other activity excepting that of the part-time sawmill operator.

Business or professional. A person engaged in ordinary business or a member of a recognized profession. In addition, it includes county merchants and political office holders.

Wage earner. Includes any type of worker not classifiable under one of the above-listed classes. Generally, this includes nonsalaried persons and clerical employees.

Housewife or widow. A woman not classifiable under any of the other occupations listed.

Recreational group. A club or organization holding the land purely for recreational purposes such as hunting, fishing, recreational camp, etc.

Real estate. A person or company interested in land for speculative purposes such as for the mineral value or for developing and selling.

Undivided estate. Refers to co-ownership by the heirs or an individual heir of an unsettled estate in land.

Retired. Persons no longer gainfully employed or engaged in business activities because of their age.

APPENDIX B

Questionnaires Used and Accompanying Letters

Letter and Mail Questionnaire to
Township Supervisors

MICHIGAN STATE COLLEGE
EAST LANSING

DEPARTMENT OF FORESTRY

Dear Sir:

The Department of Forestry at Michigan State College is making a study of forest landownership in the northern part of Michigan's lower peninsula. We are attempting to find out how much forest land is held by different groups of people and something about the problems of forest management these owners encounter.

Our study is based on impartial sampling. We have selected a number of 40-acre blocks throughout the region entirely by chance. Several of these blocks, whose locations are described on the enclosed sheets, occur in your township. We would appreciate it very much if you would write in the name and address of the owner of the property and check, to the best of your knowledge, the appropriate occupation group and size of holding which apply to the owner.

If there is more than one owner in a 40-acre sample block, it will be sufficient to make entries for the largest owner on the front side of the record sheet and entries for the second largest owner on the reverse side of the sheet. Other owners of land in the block should be disregarded.

At a later date we plan to contact some of the owners listed for information on the problems of forest land management. The study is aimed at general conclusions. No other use of individual names or records will be made.

If you will make the few entries needed on the enclosed record sheets and return them to us in the business reply envelope provided, we shall be very grateful. Your cooperation will help us make a very worthwhile study at low public cost.

Very truly yours,



T. D. Stevens, Head
Department of Forestry

Enc.

Ownership Record

Form 53 FLO 1 (Revised)

Land Description:

Subdivision _____ Section _____ T _____ R _____

Name and address of largest owner or person paying taxes in the 40-acre block described above: (Use back side of sheet for second largest owner if more than one owner occurs in the 40-acre block.)

Name _____

Mailing address _____

- I. Total amount of land held by the owner within the State of Michigan. (Check the size class you think applies to the owner. Check Unknown if you have no basis for estimate.)

- | | |
|--------------------------------|------------------------------|
| _____ 1. 0 to 499 acres | _____ 4. 50,000 acres and up |
| _____ 2. 500 to 4,999 acres | _____ 5. Unknown |
| _____ 3. 5,000 to 49,999 acres | |

- II. Occupation of owner recorded on this sheet: (Check one of the following.)

- | | |
|---|--|
| _____ 1. Lumber company. | |
| _____ 2. Pulp or paper company. | |
| _____ 3. Part-time sawmill operator. An individual who devotes only part of his time each year to the sawmill business. | |
| _____ 4. Other forest industry. A wood-using firm producing products other than lumber or pulp. Example: veneer, box board, wood chemicals. | |

- 5. Nonforest industry. Power company, mining company, gas or oil company, etc.
- 6. Farmer. A person who devotes at least 3/4 of his time to farming.
- 7. Part-time farmer. A person who farms as a sideline to other pursuits, devoting less than 3/4 of his time to farming.
- 8. Professional or businessman. Doctor, lawyer, minister, storekeeper, resort operator, filling station owner, etc.
- 9. Wage earner.
- 10. Housewife or widow. A woman not classifiable under any of the other occupations listed.
- 11. Recreational group. A person or club holding the land purely for recreational purposes such as hunting, fishing, winter sports.
- 12. Real estate business. A person or firm holding land for resale value.
- 13a. Undivided estate.
- 13b. Retired (check former occupation if known).
- 13c. Other _____ (write in occupation if none of the occupations listed applies to owner).
- III. Distance the owner lives from the land described above:
(Check one.)
- 1a. Owner lives on the property (not necessarily on the same forty).
- 1b. Owner lives within 25 miles of the property but not on it.
- 2. Owner lives farther than 25 miles from the property.

Ownership Record

Form 53 FLO 1 (Revised)

Land Description:

Subdivision _____ Section _____ T _____ R _____

Name and address of second largest owner if more than one owner occurs in the 40-acre block:

Name _____

Mailing Address _____

- I. Total amount of land held by the owner within the State of Michigan. (Check the size class you think applies to the owner. Check Unknown if you have no basis for estimate.)

- | | |
|--------------------------------|------------------------------|
| _____ 1. 0 to 499 acres | _____ 4. 50,000 acres and up |
| _____ 2. 500 to 4,999 acres | _____ 5. Unknown |
| _____ 3. 5,000 to 49,999 acres | |

- II. Occupation of owner recorded on this sheet: (Check one of the following.)

- | | |
|---|--|
| _____ 1. Lumber company. | |
| _____ 2. Pulp or paper company. | |
| _____ 3. Part-time sawmill operator. An individual who devotes only part of his time each year to the sawmill business. | |
| _____ 4. Other forest industry. A wood-using firm producing products other than lumber or pulp. Example: veneer, box board, wood chemicals. | |
| _____ 5. Nonforest industry. Power company, mining company, gas or oil company, etc. | |

- ___ 6. Farmer. A person who devotes at least 3/4 of his time to farming.
- ___ 7. Part-time farmer. A person who farms as a sideline to other pursuits, devoting less than 3/4 of his time to farming.
- ___ 8. Professional or businessman. Doctor, lawyer, minister, storekeeper, resort operator, filling station owner, etc.
- ___ 9. Wage earner.
- ___ 10. Housewife or widow. A woman not classifiable under any of the other occupations listed.
- ___ 11. Recreational group. A person or club holding the land purely for recreational purposes such as hunting, fishing, winter sports.
- ___ 12. Real estate business. A person or firm holding land for resale value.
- ___ 13a. Undivided estate.
- ___ 13b. Retired (check former occupation if known).
- ___ 13c. Other _____ (write in occupation if none of the occupations listed applies to owner).

III. Distance the owner lives from the land described above:
(Check one.)

- ___ 1a. Owner lives on the property (not necessarily on the same forty).
- ___ 1b. Owner lives within 25 miles of the property but not on it.
- ___ 2. Owner lives farther than 25 miles from the property.

Letter and Mail Questionnaire to Individual Owners

Not Classified by Township Supervisors

MICHIGAN STATE COLLEGE
EAST LANSING

DEPARTMENT OF FORESTRY

Dear Landowner:

The Department of Forestry here at Michigan State College is making a study of forest landownership in the northern counties of the Lower Peninsula of Michigan. This is being done by contacting sample landowners whose names were drawn at random from the tax records in these counties. That is how we got your name.

In this study we are interested only in general conclusions such as the amount of land held by persons of different occupations, the average size of holding, etc. All individual information obtained will be held in strictest confidence.

We would like very much to have you help us with this study by answering the questions at the bottom of this letter. After you have done that please return the letter to us in the envelope provided which requires no postage.

Thank you very much for your cooperation.

Very truly yours,

T. D. Stevens

T. D. Stevens, Head
Department of Forestry

★

★

★

What is your present occupation or business?

Is your purpose of ownership for: recreation, resale, other
(Please write in)?

How much land of all types do you own in the entire northern part of the Lower Peninsula of Michigan which would lie approximately north of a line from Muskegon to Bay City excluding Bay and Isabella counties but including Oceana, Newaygo, Mecosta and Midland counties? acres.

Approximately how far is it from your place of residence to any parcel of such land in your ownership? miles.

Questionnaire Used for Field Interviews

Classified Forestland Ownership Questionnaire

Observations on Forest Ownership in Michigan

County _____ Date _____

Survey Unit _____ Recorder _____

Owner _____ Address _____

Owner No. _____ Land Description: _____

Total land area owned in
State _____ acresForest area owned in State _____ acres
Owner occupation: (Code) _____

Forest area, size of holdings: (total forest acreage in property)

- (1) ☐ 0-499
 (2) ☐ 500-4,999
 (3) ☐ 5,000-49,999
 (4) ☐ 50,000 and up

General influences:

1. Length of tenure: (years in present ownership)

- (1) ☐ 1-2 (4) ☐ 7-8 (7) ☐ 16-20
 (2) ☐ 3-4 (5) ☐ 9-10 (8) ☐ 21-25
 (3) ☐ 5-6 (6) ☐ 11-15 (9) ☐ 26 and up

2. Inheritance status of ownership: (applies only to individual or family ownership)

a. Prior to present ownership the property has been in the family:

- ☐ No generations
☐ One generation
☐ Two generations

b. Expect property to remain in present family ownership one or more generations: ☐ yes ☐ no

3. Method by which owner acquired title to land:

- (1) ☐ Purchase (3) ☐ Foreclosure
 (2) ☐ Inheritance (4) ☐ Gift

4. Distance of owner from forest: (miles)
- | | |
|--------------------------------------|---|
| (1) _____ 25 or less | (2) <input type="checkbox"/> 26-100 |
| (a) <input type="checkbox"/> On site | (3) <input type="checkbox"/> 101-200 |
| (b) <input type="checkbox"/> 1-25 | (4) <input type="checkbox"/> 201 and up |

5. Objective of management:
- | |
|--|
| (1) <input type="checkbox"/> Farm usage: Any combination of home use, timber sale, and pasture |
| (2) <input type="checkbox"/> Growing timber for sale |
| (3) <input type="checkbox"/> Production for owner's wood-using plant |
| (4) <input type="checkbox"/> Investment or speculation |
| (5) <input type="checkbox"/> Sale of mature timber |
| (6) <input type="checkbox"/> Sale of mineral or mineral rights |
| (7) <input type="checkbox"/> Clear for agriculture |
| (8) <input type="checkbox"/> Recreation or residence |
| (9) <input type="checkbox"/> Inactive |
| (10) <input type="checkbox"/> Other (specify) _____ |

6. Age class of owner in years:
- | | |
|---------------------------------------|---------------------------------------|
| (1) <input type="checkbox"/> Under 30 | (4) <input type="checkbox"/> 51-60 |
| (2) <input type="checkbox"/> 31-40 | (5) <input type="checkbox"/> Above 60 |
| (3) <input type="checkbox"/> 41-50 | (6) <input type="checkbox"/> Unknown |

7. Owner or agent in charge of farm-woodland management:
- | |
|--------------------------------------|
| (1) <input type="checkbox"/> Owner |
| (2) <input type="checkbox"/> Manager |
| (3) <input type="checkbox"/> Tenant |

8. Is forest area grazed: ☐ Entirely ☐ Partially ☐ None

Owner's control of timber cutting: (most recent cutting) Year _____

- | | | |
|---|------------------------------|-----------------------------|
| 1. Was cutting under supervision of a professional or a local forester? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Was cutting supervised by owner or a nonforester representative? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. Were trees marked for cutting? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

4. Was a minimum cutting diameter specified? ☐ Yes ☐ No
If yes, what?

D.b.h.:	Softwood	_____	Hardwood	_____
Stump:	Softwood	_____	Hardwood	_____

5. Does the owner profess having intended to leave any merchantable trees standing? ☐ Yes ☐ No

Attitude of owner toward timber management:

1. What is owner's expressed attitude toward forest fires:

(1) <input type="checkbox"/> Strongly opposed	(3) <input type="checkbox"/> Indifferent
(2) <input type="checkbox"/> Mildly opposed	(4) <input type="checkbox"/> In favor of forest fires
2. What is owner's concept of timber management?

(1) <input type="checkbox"/> No idea
(2) <input type="checkbox"/> Fire protection or reforestation and/or refraining from cutting
(3) <input type="checkbox"/> Light cutting and other measures for public good, at some personal sacrifice
(4) <input type="checkbox"/> Light cutting and other measures economically desirable in the long run, but not at present
(5) <input type="checkbox"/> Light cutting, economically desirable both in the present and long run
(6) <input type="checkbox"/> Fire protection and light cutting, economically desirable both in the present and long run
(7) <input type="checkbox"/> High, continuing yield of timber products
3. Does owner recognize the possibility that his timber management could be improved? ☐ Yes ☐ No
4. If owner says his timber management is not satisfactory, what is his explanation? (two choices)

(1) <input type="checkbox"/> Lack of interest in timber production
(2) <input type="checkbox"/> Present high prices preferred to uncertain prices of future
(3) <input type="checkbox"/> Immediate need of liquidating timber for cash
(4) <input type="checkbox"/> Belief that woods do not need care
(5) <input type="checkbox"/> Inability to supervise because of physical limitations or demands of more remunerative activity
(6) <input type="checkbox"/> Long periods between incomes
(7) <input type="checkbox"/> Area too far away for constant supervision

- (8) ☐ Expected returns of management do not justify the necessary costs
 - (9) ☐ Inability to get contractor to cut his forest conservatively
 - (10) ☐ Property too small to bother with
 - (11) ☐ Unfulfilled hope to clear forest for pasture or other land use
 - (12) ☐ Uncertainty of ownership in undivided estate
 - (13) ☐ Don't know or no clear explanation
 - (14) ☐ Other _____
-

Class of cutting practice (most recent cutting in last 5 years):

☐ Good ☐ Fair ☐ Poor

Attitude of owner toward taxation: (only two checks for items 1 through 3)

1. Owner's qualification and registration under Michigan yield tax laws:
 - (1) ☐ Qualifies but has not registered under commercial forest yield tax
 - (2) ☐ Qualifies and has registered under commercial forest yield tax
 - (3) ☐ Qualifies but has not registered under woodlot yield tax
 - (4) ☐ Qualifies and has registered under woodlot yield tax
 - (5) ☐ Does not qualify for yield tax
2. Owner's attitude toward yield tax

If he does not know of existence of applicable law, but qualifies for registration:

 - (1) ☐ Shows no interest
 - (2) ☐ Shows interest in possible tax benefits, but does not indicate management would be influenced
 - (3) ☐ Shows interest in possible tax benefits, and indicates management would be influenced

If he knows about existence of law, qualifies, but has not registered:

- (4) ☐ Does not think he would qualify
- (5) ☐ Does not know how to go about registration

- (6) ☐ Believes restrictions outweigh possible tax benefits
- (7) ☐ Does not believe he would gain tax benefits
- (8) ☐ Objects to special privilege taxation on principle

If he has registered:

- (9) ☐ Believes his management has not been influenced
- (10) ☐ Believes his management has been influenced
- (11) ☐ Does not believe ownership could be retained without this tax aid

3. Owner's attitude toward special federal income tax provisions for timber producers (capital gains and depletion allowances)
If he does not know of existence of law:

- (1) ☐ Shows no interest
- (2) ☐ Shows interest in possible tax benefits, but does not indicate management would be influenced
- (3) ☐ Shows interest in tax benefits, and indicates management would be influenced

If he knows about existence of law, but has not made use of it:

- (4) ☐ Does not know how to go about tax calculations
- (5) ☐ Believes effort to use special provisions outweigh possible tax benefits
- (6) ☐ Does not believe he would gain tax benefits
- (7) ☐ Objects to special privilege taxation on principle

If he has made use of law:

- (8) ☐ Believes his management has not been influenced
- (9) ☐ Believes his management has been influenced
- (10) ☐ Does not believe ownership could be retained without this tax aid

4. General property tax on forestland

- (1) Amount of annual tax _____ cents per acre
- (2) If tax were lowered, would owner be stimulated to improve management? (Check all measures affected.)
 - (a) ☐ By intensifying the cultural measures used in woods

- (b) ☐ By stepping up of planting rate
- (c) ☐ By acquisition of new holdings for timber management

Attitude of owner toward aid from county agricultural agent:

1. Does owner know the county agricultural agent, at least by name? ☐ Yes ☐ No
2. Has owner requested any aid or advice of county agricultural agent? ☐ Yes ☐ No

Attitude of owner toward extension forestry demonstration and advice:

1. If owner did not know such aid was available:
 - (1) ☐ Shows no interest
 - (2) ☐ Shows slight interest
 - (3) ☐ Shows strong interest
2. If owner knows about availability of such aid, qualifies, but has not applied:
 - (1) ☐ Feels it is too difficult to obtain such advice
 - (2) ☐ Does not feel anything can be gained from it
 - (3) ☐ Expects to ask for advice or attend demonstrations in future
 - (4) ☐ Considers extension valuable, but has technical competence or employees with technical competence
 - (5) ☐ Considers extension valuable, but has applied for aid from farm forester or S.C.S. farm planner
3. If owner has made use of extension aid:
 - (1) ☐ Doubts technical soundness of advice; hence does not follow it
 - (2) ☐ Believes advice technically sound, but does not believe it is practical
 - (3) ☐ Believes advice is good, but cannot afford (financially) to follow it
 - (4) ☐ Has followed advice, but considers results unsatisfactory
 - (5) ☐ Has followed advice, but is uncertain if it is satisfactory
 - (6) ☐ Has followed advice, and considers it satisfactory

Attitude of owner toward service activities of farm foresters:

1. If owner did not know such aid was available:
 - (1) ☐ Shows no interest
 - (2) ☐ Shows slight interest
 - (3) ☐ Shows strong interest
2. If owner knows about availability of such aid, qualifies, but has not applied:
 - (1) ☐ Feels it too difficult to obtain on-the-ground aid
 - (2) ☐ Does not feel anything can be gained from it
 - (3) ☐ Expects to ask for aid in future
 - (4) ☐ Considers such aid valuable, but has technical competence or employees with technical competence
 - (5) ☐ Considers such aid valuable, but has applied for aid from extension forester or S.C.S. farm planner
3. If owner has made use of aid offered by farm forester:
 - (1) ☐ Doubts technical soundness of advice; hence does not follow it
 - (2) ☐ Believes advice technically sound, but does not believe it practical
 - (3) ☐ Believes advice is good, but cannot afford (financially) to follow it
 - (4) ☐ Has used aid, but considers results unsatisfactory
 - (5) ☐ Has used aid, but is uncertain if it is satisfactory
 - (6) ☐ Has used aid, and considers it satisfactory

Attitude of owner toward forestry conservation payments (applies to farmers only):

1. Is owner's property located in a county where forestry conservation payments are available? ☐ Yes ☐ No
2. Owner's qualification and application for payments (applies only where conservation payments are available):
 - (1) ☐ Does not qualify
 - (2) ☐ Qualifies, but has not applied
 - (3) ☐ Qualifies and has applied for payments

3. If owner qualifies for forestry conservation payments, check his practices which qualify:

(1) ☐ Planataion (3) ☐ Timber stand improvement
 (2) ☐ Windbreak (4) ☐ Fencing woodland

4. Owner's attitude toward payments (in counties where conservation payments are available):

If he does not know of availability of paymens:

(1) ☐ Shows no interest
 (2) ☐ Shows interest in possible payments, but does not indicate practices would be influenced
 (3) ☐ Shows interest in possible payments and indicates practices would be influenced

If he knows about availability of payments, qualifies, but has not applied:

(4) ☐ Does not think he would qualify
 (5) ☐ Does not know how to go about applying for payments
 (6) ☐ Believes trouble of application outweighs possible money benefits
 (7) ☐ Objects to conservation payments on principle

If he has applied:

(8) ☐ States practices would not have been undertaken without payments
 (9) ☐ States practices would have been undertaken regardless of payments

5. Owner's attitude toward payments (in counties where conservation payments are not available):

(1) ☐ Shows no interest
 (2) ☐ Shows interest in possible payments, but does not indicate practices would be influenced
 (3) ☐ Shows interest in possible payments and indicates practices would be influenced

Attitude of owner toward S.C.S. forestry aids (applies to farmers only):

1. Is owner's property located in the S.C.S. district:
☐ Yes ☐ No
2. Owner's qualification and application for S.C.S. farm plan:
(1) ☐ Does not qualify
(2) ☐ Qualifies, but has not applied
(3) ☐ Qualifies and has become a cooperator
3. Owner's attitude toward woodland if he has become a S.C.S. operator:
(1) ☐ Does not consider woodland to have a significant place in farm plan
(2) ☐ Considers woodland to have a minor place in farm plan
(3) ☐ Considers woodland to have an important place in farm plan
4. If owner has become an S.C.S. cooperator, check forestry practices which were adopted as result of recommendations of farm plan:
(1) ☐ Plantation
(2) ☐ Windbreak
(3) ☐ Timber stand improvement
(4) ☐ Fencing woodland

Attitude of owner toward more intensive forestry aids (applies to small private holdings):

1. Would owner be interested in using the services of a forester to manage his forest property under good forestry practices at a cost not to exceed 20% of the gross stumpage value: ☐ Yes ☐ No
2. Would owner be interested in joining other owners in same area in a cooperative which would hire a forester to jointly manage their forest properties? ☐ Yes ☐ No

Attitude of owner toward forest credit:

1. Has owner given any previous thought to use of readily available, long-term, low-cost forest credit?
☐ Yes ☐ No
2. Would owner be interested in borrowing if forest credit was readily available on a long-term, low-cost basis?
 - (1) ☐ Not interested
 - (2) ☐ Mildly interested
 - (3) ☐ Strongly interested
3. If interested, for what purposes would owner wish to borrow?
 - (1) ☐ To obtain new logging and/or milling equipment for more profitable operations
 - (2) ☐ To obtain new logging and/or milling equipment to step up rate of liquidation or merchantable timber
 - (3) ☐ To improve road system or fire protection for intensifying of forest management
 - (4) ☐ To purchase new forest holdings for sustained-yield operations
 - (5) ☐ To undertake long-range cultural measures (planting, cleanings, improvement cuttings) whose money benefits will be postponed to future
 - (6) ☐ To clear land and convert to improved pasture or cropland.
 - (7) ☐ Other (specify) _____

General Remarks:

Letter and Mail Questionnaire to Individual
Absentee Owners Previously Classed into
Occupations by Township Supervisors

MICHIGAN STATE COLLEGE
EAST LANSING

DEPT OF FORESTRY

Dear Landowner:

The Department of Forestry here at Michigan State College is making a study of forest landownership in the northern counties of the Lower Peninsula of Michigan. This is being done by contacting sample landowners whose names were drawn at random from the tax records in these counties. That is how we got your name.

During the past summer we visited and talked with many of the owners in this sample group. Since such personal visits are very costly we are seeking to contact the majority of owners by mail. We hope you will be interested in completing the enclosed questionnaire and will return it to us at your earliest convenience in the enclosed envelope. This is quite important because your answers will be considered representative of scores of other owners.

This study is not aimed at any person's private affairs. Individual information obtained in this study will not be disclosed for any purpose. We are interested only in general conclusions such as the amount of land held by persons of different occupations, the average size of holding, the most important objectives of forest landownership, etc. We are interested also in what has influenced you regarding the handling of this land and if you are taking advantage of governmental help that is available. We are not asking you to sign the questionnaire so we hope you will feel free to express your frank opinions.

We wish to remind you that the college offers advice or assistance with many woodland management problems. When seeking such help write to the "Extension Forester" at this address. Or, if you should have any questions in mind at present, just enclose your letter with the questionnaire when you return it.

Thank you very much for your cooperation.

Very truly yours,

T. D. Stevens

T. D. Stevens, Head
Department of Forestry



Centennial

"IT IS FOR US THE LIVING . . . TO BE DEDICATED HERE TO THE UNFINISHED WORK . . ."

Questionnaire Number _____

What is your occupation? _____

- A. 1. How much land do you own in the entire northern part of the Lower Peninsula of Michigan which would lie approximately north of a line from Muskegon to Bay City excluding Bay and Isabella counties but including Oceana, Newaygo, Mecosta and Midland counties? _____ acres.
2. About how much of this land is wild land (that is, land which is not cultivated or improved pasture)? _____ acres.
3. How long has this land been in your ownership or the ownership of the person you represent? _____ years.
4. Was this land held in your family before you acquired it? _____ (yes or no)

*

*

*

- B. Check one of the following which you believe most nearly fits your objective of owning this wild land.

- ____ (1) Home use production of timber; such as for fuelwood, pasture, sale of a little timber now and then, or cutting posts or logs for your own use.
- ____ (2) Specifically for growing timber which will be sold when you think it ready for harvest.
- ____ (3) As a source of timber for your wood-using plant.
- ____ (4) For investment or speculation.
- ____ (5) In order to procure the timber which you sold or plan to sell.
- ____ (6) In order to gain control of the mineral rights.
- ____ (7) To be cleared for agricultural purposes.
- ____ (8a) For recreational purposes such as for a place for hunting or fishing, or a summer home.
- ____ (8b) As a place of residence.
- ____ (9) No particular objective in view except simply holding the land and paying the taxes.

____ (10) If none of these seem to fit, write in your purpose here. _____

- C. Is any of this wild land pastured at present? Please answer by indicating the degree of pasturing, such as ____ Entirely, ____ Partially, ____ None

*

*

*

- D. 1. Has any timber cutting been done on your land since you acquired ownership? ____ (yes or no)
(If you answered yes to the question just above please answer the remaining questions in this section; if your answer was no, proceed to Section E.)
2. What was the last year of timber cutting on your land if any has been done during your ownership? ____
3. Was a professional forester in charge of this cutting? ____ (yes or no)
4. Was the actual cutting overseen by you or a representative of yours? ____ (yes or no)
5. Were the trees which were cut selected and marked by you or some person acting for you before the cutting began? ____ (yes or no)
6. Did you restrict this cutter by telling him to cut no trees under a certain diameter? ____ (yes or no). If the answer is yes, what was the diameter specified and for what species was it so designated? ____ Diameter, ____ Species
7. Did you plan to have all merchantable trees cut? ____ (yes or no)
8. Do you think there is any timber of value on your land? ____ (yes or no)
9. Do you think there is any chance of developing it so that it will have some value in the future? ____ (yes or no)

*

*

*

E. If you would like to do more in the way of developing the timber on this land but you have not done so, please indicate why you have not by picking a first and second choice among the following:

- ___ (1) Have no interest in growing timber.
- ___ (2) Fear future prices may drop.
- ___ (3) Had to sell timber to obtain cash
- ___ (4) Think woods do better without the help of man.
- ___ (5a) Not physically able to take care of it.
- ___ (5b) Find other work too pressing on time.
- ___ (6) Don't like long waits between harvests of timber.
- ___ (7) Consider the woods too far away.
- ___ (8) Don't believe future returns from the woods justify any investment now.
- ___ (9) Fear to permit timber cutters in the woods because of probable damage they might do.
- ___ (10) Think the wooded area is too small to bother with.
- ___ (11) Plan, or did plan, to clear the land for pasture or crops.
- ___ (12) Not sure of future ownership because the land is somewhat legally involved.

*

*

*

F. 1. Did you know that forest owners could report income from the sale of timber stumpage held more than six months as a "capital gain" on their federal income tax and thus reduce the tax on that part of their income by about one-half the regular amount? _____ (yes or no)
(If your answer to this question is yes, please answer the next two questions.)

2. Have you ever taken advantage of this special law? _____
(yes or no)

3. If you knew about this privilege but did not take advantage of it when you could have done so - why didn't you?

G. 1. Have you ever obtained any advice regarding the handling of these wooded areas by: writing to the college, reading bulletins, or attending forestry demonstration meetings? _____
(yes or no)

2. Did you know such free aid was available? _____ (yes or no)
3. If you have obtained any such aid, would you rate it satisfactory or unsatisfactory? _____
4. Why did you never seek such aid if you knew about it, yet never used it? _____
5. Do you think you might make use of this type of help in the future? _____ (yes or no)

*

*

*

- H. 1. Have you ever obtained any on-the-ground aid or advice in the handling of your woodland from the foresters with the State Conservation Commission? _____ (yes or no)

2. Did you know such an on-the-ground service was available to forest owners without cost? _____ (yes or no)

3. If you have obtained such aid, would you rate it as satisfactory or unsatisfactory? _____

4. If you knew such a service to be available but never made use of it - why not? _____

*

*

*

- I. Do you think you would be interested in using the services of a private forestry consultant to manage your property under good forestry practices which guard against over-cutting if he would charge you only a small percentage (10%-20%) of whatever income he might obtain for you from this property through timber sales? _____ (yes or no)

- J. Would you be interested in borrowing money at a very low rate of interest for the purpose of improving your forest land by such things as planting, removing undesirable trees, etc., if such credit were available and if could be secured by only the timber values on the land? _____ (yes or no)

APPENDIX C

Statistical Formulas Derived for This Study

Statistical Procedures and Basic Assumptions
Involved in Calculation of Sampling Error

This section refers to the estimates of total commercial forest area by occupation classes and the sampling errors involved in making those estimates (Table 5).

In order to arrive at the results shown in Table 5, it was necessary to assume:

1. That total privately owned commercial forestland area for each block as estimated by the Forest Service had a maximum sampling error of ± 1.5 percent at one standard deviation. This was considered safe since preliminary calculations by the Forest Service indicated the maximum error under these circumstances was less than 1.2 percent.
2. That the estimate of total commercial forestland area by the Forest Service (X) was made independent of this ownership study. This was not exactly true since one sample was actually derived from the other. Use of the Forest Service estimate was justifiable because it was by far the most accurate estimate available.

3. That each forty came into the sample with equal probability. Actually, the probability of this event was equivalent to: total forest area of i th forty / total forest area of all forties in the sample. All estimates made in this study were made involving the above assumption. To have made the estimates otherwise would have multiplied the required computing work several fold. Further, when the two methods were tested in estimating forest area for one occupation class for one block, the results obtained were almost identical.
4. That the total number of forties (N) in i th-stratum possessing some commercial forestland could be estimated by dividing the Forest Service estimate of total commercial privately owned forest area in i th-stratum (i.e. block) by the estimate of the average commercial forest area per forty in that stratum. The estimate of the latter quantity was made from the sample. No other choice was available for estimating the total number forested forties.

The formulas used for making the calculations were as follows:

$$V(Y) = \sum [\hat{R}_h^2 V(\hat{X}_h) + X_h^2 V(\hat{R}_h) + V(\hat{R}_h) V(\hat{X}_h)]$$

where:

$$V(\hat{R}_h) = \left[\frac{1}{\hat{X}_h^2} \right] \left[\frac{\hat{N}_h(\hat{N}_h - n_h)}{n_h(n_h - 1)} \right] \left[\sum_i y_{hi}^2 + \hat{R}_h^2 - \frac{\sum_i \hat{X}_h^2}{\sum_i y_{hi} x_{hi}} \right]$$

$$\text{and: } \hat{Y} = \sum_h \hat{R}_h \cdot \hat{X}_h$$

$$\text{and: } \hat{R}_h = \frac{y_h}{x_h}$$

Individually the symbols used had the following meanings:

\hat{N} = an estimate of the number of forties possessing some private commercial forest.

i = the subscript specifying a forty.

n = the number of forties in the sample.

x_i = the total forest acreage in i th forty possessing the characteristic x .

y_i = the forest acreage in i th forty possessing the characteristic y .

\hat{X} = an estimate of the total forest acreage in the population of N forties possessing characteristic x .

\hat{Y} = an estimate of the total forest acreage among N forties possessing a certain characteristic y .

$$y = \sum_{i=1}^n y_i$$

$$x = \sum_{i=1}^n x_i$$

\hat{R} = the ratio estimator $\frac{y}{x}$

h = the subscript denoting the stratum (blocks 1, 2, 3, 4, or 5).

V = a prefix denoting the variance of an estimate.

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