A PROPOSED TECHNIQUE FOR MEASURING AND COMPARING THE ECONOMIC IMPORTANCE OF TIMBER AND WILDLAND RECREATION IN MICHIGAN

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY

Marshall N. Palley

1956

This is to certify that the

thesis entitled

A Proposed Technique for Measuring and Comparing the Economic Importance of Timber and Wildland Recreation in Michigan

presented by

Marshall M. Palley

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Forestry

Lee M. James
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Date 3/1/56

O-169

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By

Marshall N. Palley

A THESIS

Submitted to the School of Advanced Graduate Studies of
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The important uses of wildland in Michigan are forestry and recreation. Demand for both timber products and recreational opportunities is on the increase. This enlarged demand for forest goods and services underlines the need for establishing priorities in forest land use, particularly in connection with the large area of publicly owned forest land.

One approach to setting up the needed priorities of use would be in terms of an economic comparison of forestry and forest recreation. The fact that the economic benefits resulting from each of these uses accrue not simply to the land owner but are widely diffused occupationally and geographically adds to the complexity of the problem of economic comparison. This study therefore has for its aim formulating a means of measuring and comparing the economic importance of timber and forest recreation in Michigan. Such a methods study is held to be a necessary preliminary to making the required economic comparison.

The problem under investigation has been approached through a critical review of related studies in the literature, a consideration and formulation of pertinent portions of economic theory, and an examination of the current availability of the desired statistical quantities.

Examination of a number of economic appraisals of the contributions of forest products and services indicated the wide range of approaches possible. A consideration of pertinent principles in the economics of land proved helpful in bringing the various services of

forest land into sharper perspective. A brief survey of the wildland economy of Michigan served to emphasize the extent, uses, and relationships of the products of Michigan forest lands. Of the possible alternatives for measuring economic importance, the national income accounting approach of the U. S. Department of Commerce was the one selected as most serviceable for the purposes at hand.

The results of this study are of two kinds. An approach to measuring the economic importance of timber products and of the bundle of economic consequences of the use of land for recreation has been formulated in such a way that it will offer a fair comparison of these two alternative uses of forest land within the framework of the economy of the State of Michigan. This approach involves determining the contributions to the national income originating with each of these industries in Michigan. To achieve comparability, it has been proposed that the measurement be carried out at consumer level or at the highest level of production attained in Michigan and that measurement be limited to income accruing to the economy of Michigan.

Other results of this study relate to a test of the feasibility of the proposed measurement technique. Evidence is presented that the measurement for timber may be implemented with existing statistics on national income and the value added in manufacturing and trade. The state of information on the recreation industry is reviewed and the less complete and satisfactory portions of the needed information identified. The need for further consumer surveys to supply these deficiencies is indicated.

ACKNOWLEDGMENTS

This study was initiated at the suggestion of Dr. Lee M. James of Michigan State University and carried out under his helpful and instructive supervision. The need for making such a study was formally recognized in the minutes of a June, 1955, meeting of the Wildland-Use Committee of the Lower Michigan Forest Research Council, of which Dr. James is Co-chairman. In consideration of his assistance in this undertaking and his guidance in my graduate program of study, this dissertation is herewith dedicated to Dr. James.

Special thanks are extended to Drs. Raleigh Barlowe, Denzel Cline, and Glenn L. Johnson of Michigan State University who, along with Dr. James, deserve much of the credit for what there is of economic truth in the pages that follow.

Very material assistance was afforded the writer by Michigan State University in the form of a Graduate Council Fellowship and a Graduate Assistantship in the Department of Forestry which are hereby gratefully acknowledged. It has been a privilege to be associated with the Head of the Forestry Department, Dr. Terrill D. Stevens, and to enjoy the benefit of his wise example and encouragement as a member of my committee.

To my father and mother, Mr. and Mrs. J. Lewis Palley of Pittsburgh, Pennsylvania, who have provided financial and moral aid unstintingly to provide yet another installment in their son's

formal education, I express a full measure of filial gratitude. And, to my wife Margaret Knight Palley, I express my affectionate appreciation for her shouldering so large a part of the burdens of caring for our children and, with them, affording me the joys of a family life which complemented and facilitated the accomplishment of my program of graduate study.

Thanks are extended also to the Michigan Department of Conservation for the use of a table from Michigan Conservation, and to Mrs. Mary Seaman for typing the manuscript.

INTRODUCTION

A few short years ago, serious land-use problems in the cutover region of the state of Michigan led to some important changes in the land-holding pattern in that part of the state. Millions of acres of land held for farming or for speculation were given up to the State for non-payment of taxes, or were sold to the Federal Government. In place of a pattern of isolated forest homesteads on sub-marginal lands incapable of supporting a profitable agriculture or a solvent local government organization, a new public domain came into being with nearly seven million acres of land dedicated to forestry and recreation.

A decade and a half of full employment and high level economic activity have been experienced since that time. The new pattern of land use has had an opportunity to become stabilized. Reversion of lands to the State for non-payment of taxes is now practically unknown. The holdings of both State and Federal Governments have leveled off at a figure not likely to be greatly changed one way or the other in the near future. The policy of managing for forestry and recreation, of multiple-use management, has now had a number of years of trial under Michigan conditions. From the standpoint of using each piece of land according to its capabilities, substantial gains have been made. At the same time, the persistence of a low-income problem in northern Michigan, the failure of this part of the state to share fully in the gains in living standards and productivity experienced elsewhere in the State and Nation, have been a source of continuing concern.

The resource base appears to be holding up fairly well under the demands which are being made upon it for forest products and recreational opportunities. Shrinkage of the supply of old-growth hardwood timber in the west half of the Upper Peninsula has probably been counter-balanced by improvements in volume and stocking of large areas of second-growth forest there and in the Lower Peninsula. Depletion of natural stands of softwood sawtimber and pulpwood has been partially offset by the progress of the numerous plantations of coniferous species of forest trees in the state. Similarly, the destruction of deer range occasioned by over-population of the deer herd has been eased by more liberal shooting regulations and compensated for by habitat improvement measures.

The ability of the land resource base to continue to meet the expected future requirements for timber and recreational opportunities is open to question. The capacity of existing Michigan pulp mills, with special reference to their ability to use Michigan-grown woods, is being considerably enlarged. A new mill is to be constructed at Alpena which will use 60,000 to 80,000 cords of Michigan aspen per year for the production of hardboard.[1] There is a striking growth in the use of wildland for recreation as measured by such indices as sales of hunting licenses and visits to state parks and national forests. As with our schools, our roads, our public health services,

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[1] Wood Topics, Michigan Conservation Department, July-Dec. 1955.

the demand for these publicly provided services appears to outrun the supply. Provision of free government services creates new demand before the old can be satisfied. Because some forms of wildland recreational use are extensive users of land, the striking growth in use and the promise of sustained future growth prompts concern about the effects of increasing recreational use on other forest values. Some observers have also seen an important threat to wildlands in the growing residential use of rural lands by non-farm families. We have apparently only witnessed the beginning of the growth of the rural-urban fringe.

The benefits of recreational use have accrued largely to those people from all parts of the State who have been the enjoyers of the recreational values -- the sightseers, the campers, the hunters, the hikers. To a degree, residents of the wildland districts have benefitted from added employment opportunities. The question which arises is how far recreational use can be allowed to go where it comes into conflict with other wildland uses. Ours is a civilization which is lavish in its use of materials. It may not be too early to think in terms of a balance between the use of forest land for growing essential raw materials and the use of forest land for direct enjoyment.

Both at the local level and at the state level, priorities in forest land use must somehow be arrived at. Since such a sisable part of Michigan's forest land is publicly owned, such priorities in use must be hammered out through the democratic process. The public

lands are an important source of the timber and recreational atmosphere which is available to the people of the State. Policy-makers should know the optimum combination of uses to bring about the best returns from the forest lands of Michigan. As a first and more modest step in providing guides to proper management objectives, it seems desirable and worthwhile to try to find a way of determining, as of today, what is the relative economic importance of timber and forest recreation in the life of the State.

I. GOALS AND APPLICATIONS

Statement of the Problem

This study is concerned with devising a method for measuring the relative economic contributions of two of the major uses of forest land in Michigan. The uses of forest land it is proposed to measure and compare are timber growing and forest recreation. Timber and recreation are the main products sought by both public and private owners of Michigan forest lands. The U. S. Forest Service is committed by long-standing policy to "multiple-use" management of the lands under its administration. It is the policy of the Michigan Department of Conservation to hold lands which "appear to be needed by the general public for hunting, fishing, and other conservation and recreational uses."[1] The measurement of the contribution of water, a third major product of forest lands in Michigan, will not be included within the scope of the present investigation. Water, as yet, is in a subordinate position to timber and recreation as an acknowledged object of forest land management in Michigan. Its evaluation might more appropriately be carried out in a section of the country where water values are of first importance. Under Michigan conditions, water might be made the subject of a separate investigation.

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[1] Michigan Department of Conservation, Twelfth Biennial Report, 1943-44, p. 55.

In the context of the present study the economic returns of timber and of recreation must not be measured as separate and distinct undertakings. What is needed is rather a common framework for the measurement of each of these two forms of land use and their dependent economic activity. There are two reasons for adopting such a unified approach to the problem of measurement. The same acre of land often yields more than one product, making it necessary to allocate the total returns from that acre of land among several enterprises. Various complementary and competitive production inter-relations between uses may need to be sorted out in making a proper allocation of returns as, for example, between timber production and deer range, where certain timber cutting operations may be concerned.

But, there is another reason for avoiding the practice of measuring each of the important forest products and services separately and in isolation from the others. What is being sought is a comparison, a determination of relative importance. Therefore, it is necessary to find some least common measure adapted to the diversity of products to be dealt with, despite the loss in suitability which may apply to particular individual uses. It is desirable that comparisons with other forms of economic activity be possible, but this must remain a secondary consideration.

In the economic measurement of forest land products and services, the exact point of measurement chosen may have an important bearing on the resulting dollar values arrived at. It is reasonable to propose to measure both the value accruing to the land and also the resulting economic activity dependent on that use of the land.

In a highly interdependent economy, however, where one economic activity is dependent on nearly every other one, it will be found to be a difficult matter to distinguish between dependent and non-dependent activities. Such, nevertheless, will be the lines along which this investigation will procede.

This study seeks to mark out the means by which a comparison of the economic importance of timber and forest recreation in Michigan can be made. It is an economic comparison not directly obtainable from the national income and product estimates or the periodic censuses of business and manufacturing. It is held that a soundly based measurement scheme is an indispensable preliminary to carrying out the measurement operation proper. The actual measurement of the magnitudes involved is regarded as a separate project.

Economic importance will be evaluated in terms of the contribution of a given form of land use to the sum total of goods and services available to the people of Michigan for their own use or for exchange with others. These goods and services will be measured at their market price, expressed in dollars, in all those areas in which market prices are operable. Economic contribution will be measured in terms of the income produced during a calendar year. Measurement in terms of an annual flow of goods and services is a good reflection of the current contribution of particular uses of forest land. It expresses the valuations of members of society acting as consumers in the market place. But, it is not enough to measure and count the current contributions to the income accounts. Some regard must also be shown the degree of maintenance of productivity of the land-resource

base. Proper allowances must be made for additions to or deductions from the resource base which are associated in time with the flow of income from the land.

Applications

The main justification for making a methods of measurement study is the value of such an effort for the practical task of carrying out the measurement operation. If in the future a full-scale measurement project were to be carried out along the lines herein indicated, the full value of such a preliminary exploration of methods as is here being made would be realized. On the other hand, if only a portion of the approach here advocated were to be adopted in future pieces of work, it would still represent a contribution. The main purpose of this study then is to provide a framework on which a detailed study of the economic importance of specific wildland products in Michigan could be hung.

There is a real need for providing such a framework. There is no lack of authoritative pronouncements on the relative importance of the primary wildland uses, but evidence in support of most views which are put forward is not provided.

Gulick states unqualifiedly that wildlife, recreation and inspiration come far down the line in importance, compared with "national survival in timber and water."[1] On the other side of the fence is Benson, who sees the time coming in Nova Scotia when the lowest priority forest land will be that which is "so far from water,

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[1] Luther Halsey Gulick, American Forest Policy; A Study of Government Administration and Economic Control. (Published for the Institute of Public Administration, New York: Duell, Sloan and Pierce, 1951). p. 179.

so lacking in scenic attraction, and so unsuited to wildlife or blueberries as to be of value only for the production of trees."[1] The judgments of knowledgeable individuals are admittedly worth noting. It should be possible nonetheless to find some sort of objective test of such judgments.

One reason why measurement in this area has not been more actively carried on is that one important group of policy makers and administrators resolutely refuses to acknowledge the existence of a conflict. Of those who are more prepared to see the divergences of interest between uses, many are deterred by what they regard as the difficulty or the impossibility of measuring some of the important values involved. Finally, of the smaller group who have ventured on to some type of wildland product evaluation, it is difficult to borrow methods because of differences of points of view and the uniqueness of certain regional resource-use patterns. Some studies have been marred by an excess of enthusiasm and a deficiency of economic reasoning.

The importance of these comparisons is augmented by the fact that wildland use planning deals with long-range considerations. Decisions made in the present to practice pure-stand forestry, for example, have important consequences on wildlife production for a long period to come. Clearing of forest land for agriculture is a measure which can be reversed only with the passage of a period of many years. Because of the current needs to make such decisions, the need for some reliable type of evaluating framework is apparent.

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[1] D. A. Benson, "There is More in the Forest Than Trees," Forestry Chronicle, Vol. 31 (Sept. 1955), p. 235.

It is principally as a guide to public policy that the attempt to refine and extend the economic measurement of the contributions of wildland is undertaken.

Economic measurement of the current contributions of differing forms of wildland use would provide guides to policy, to be used judiciously in connection with other guides. It would have the substantial advantage of substituting objective numerical values for subjective hunches or hastily gotten up quantities. A guide might be provided to government, for example, in connection with its promotional expenditures for economic development. The desirability of making funds available for services to new wood-using industries might be weighed against the expenditure of sums of money to advertise the tourist attractions of Michigan in the national magazines.

Some wildland products are essential raw materials, like timber and water. Others touch closely on deeply felt national values, such as the beauty of the undisturbed wild environment and the right of access to its enjoyment. Aside from their overall importance to the things Americans cherish as a people, it is the nature of these wildland products that they do not always respond well to the regulating influences of the economic market mechanism. As will become clear in the pages which are to follow, portions of the wildland economy are immune to the influences of the market; other portions respond in socially undesirable ways if the operation of natural economic forces is allowed to go unchecked. Therefore, in our mixed system, mixed in the days of Adam Smith and more mixed in our own time, a larger element of intentional control needs to be exercised over the wildland portion

of the economy than over many another portion. Where the "invisible hand" fails to direct the operation of things in a beneficent way, men must make conscious decisions, based it is to be hoped on the relevant facts of the case, economic facts among others.

A well-conceived plan for the measurement of wildland values in Michigan may have significance beyond the immediate limits of its direct implementation in a Michigan setting. Government operation characterizes a sizable portion of economic activity. Government regulation applies to nearly all the rest. The economic evaluation of the costs and benefits of government operations is a large and various task on which but little and local progress has been made. The work in connection with the evaluation of the desirability of large-scale water projects is among the most detailed which has been carried out.[1] However, such work falls far short of meeting the needs and complexities of other government activities. It might reasonably be expected that a well-directed evaluation of forest land resources in the State of Michigan would have a general significance and application to the larger endeavor of measuring economically the effects of government operations. Thus, there might conceivably be a larger methodological significance in the present project.

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[1] A good summary of the thinking of the interested federal agencies is contained in the report of the Subcommittee on Benefits and Costs to the Federal Interagency River Basin Committee, Proposed Practices for Economic Analysis of River Basin Projects (Washington, 1950).

The study which follows seeks to find a means of measuring the economic importance of the major uses of Michigan wildlands to Michigan people now living, viewing the products of these lands as a flow of goods and services and of net additions to productive capacity valued at their present worth. Such an evaluation seeks to discover in real and effective terms how much better off the contemporary generation is with the benefits of each of these uses as compared with how well off it would be without such benefits. This methodological investigation is held to be of value and significance, because of its bearing on general problems of economic measurement and because of the aid it should render a detailed effort to measure the specific areas of activity herein dealt with. It should serve the helpful purpose of clarifying the assumptions of existing efforts to measure similar wildland values and should enable improvements to be made in future work, all directed at providing sounder guides to wise public policy in land use.

II. A REVIEW OF THE LITERATURE

In building up a system for measuring the economic importance of wildland uses, help can be gained in several distinct quarters. First, there are specific studies of particular wildland uses in particular localities which may yield interesting methodological ideas. A second source of guidance is to be found in the specialized literature dealing with national income accounting. Finally, there are the principles of economic theory, which should be serviceable here, as in all other economic contexts. In particular, the theory of the economics of land should be of especial relevance. It is proposed to discuss specific land use evaluation studies in the present chapter. The contribution of land economics forms the subject matter of the following chapter.

Of the literature which has a bearing on measuring the economic importance of wildland resources, few works have concerned themselves specifically with formulating techniques of economic measurement. More commonly, such studies have relied on systems of measurement which have tended to be implicit rather than explicit, customary and expedient rather than novel and analytical. Carried out frequently by such generalists as geographers, or by such technical subject matter specialists as wildlife biologists, the soundness of the economics employed in some of these studies is open to question. More sophisticated economic analysis and reasoning is to be found in related works which have been written by economists, forest economists, and agricultural economists.

Regardless of the authorship, a consideration of these economic studies of wildland resources is an essential step in arriving at a system of measurement. These works can be classified usefully in terms of the major use or uses with which they are concerned. The discussion which follows is accordingly organized under the headings of recreation, hunting and fishing, timber, and water for forage and livestock. A general summary of methods and of sources of data then concludes this review of the literature.

Recreation

For some 25 years, forest recreation has been accorded formal recognition as a source of wealth and as a form of land use.[1] When the agricultural boom in the northern Lake States collapsed shortly after World War I, the tourist trade appeared as an alternative to timber and farming. If the plow could not everywhere follow the axe, then why not the rod and gun and camera? Where there were summer people the economic infusion was noticeable and immediate. Income problems, both individual and governmental, appeared to be greatly diminished. Northern Michigan had water and greenness and a good location with respect to the great industrial centers of the north central region. The onset of the general depression, in 1929, only made worse the already serious problems of the northern cut-over lands of Michigan

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[1] An early reference is K. C. McMurry, "Use of Land for Recreation," Annals of the Association of American Geographers, XX (1930), 7-20.

and adjoining states. It was at this period that a study of the contribution of recreation to northern residents and governmental units was carried out by Wilbur O. Hedrick at Michigan State College.[1]

The contribution of recreation was measured by Hedrick in terms of the assessed valuation in 1931 of recreational properties on the tax rolls of 189 townships and 2 city government units of the northern part of the Lower Peninsula of Michigan. The assessed valuation of recreational properties was determined for each affected taxing unit and expressed as a percentage of the total assessed valuation of all property within the jurisdiction of that unit. Hedrick found a great range in both the proportions of the tax load borne by recreational properties and in the absolute size of the tax burden on such properties from place to place. In as many as 20 of the townships, the major share of all property taxes was being paid by the recreational properties. A comparison of the steadiness of tax revenues from recreational townships compared with non-recreational townships for the years 1926-1931 showed more cases of increased assessed valuations among the recreational townships than among the purely agricultural townships.

On the descriptive and historical side, Hedrick's bulletin on recreational use of land in northern Michigan provided a store of valuable and interesting information. An interesting classification

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[1] Wilbur O. Hedrick, Recreational Use of Northern Michigan Cut-over Lands, Michigan Agricultural Experiment Station Bulletin No. 247, 1934.

of the various classes of recreational use was presented. The geographic distribution of particular types of use, such as the summer resort and the hunting and fishing club, was clearly marked out in informative maps and tables. The historical background of these land-use developments was filled in and considerable detail on the location and size of the larger individual group undertakings was provided.

Professor Hedrick's approach to evaluating recreational use of land was from the standpoint of the economy of the local community and the local governmental units. Recreation was treated as a source of wealth to a community, as an industry sustaining or helping to sustain the economic life of the community. The recreationist was an outsider who made his money elsewhere. Through ownership of local land and improvements and through seasonal residence in the district, he made an economic contribution to the well-being of the full-time residents. Hedrick saw this contribution to local economic life expressing itself mainly in additions to the local property tax base, and in the stimulus provided to local business and employment. The taxes levied on recreational properties owned by non-residents were held to be more than sufficient to offset the added costs of local government resulting from the needs of servicing these properties. One important saving was in connection with schools, since summer residents helped to support them but provided no children during the school year to add to the costs of building and operating the educational plant.

A pair of recent doctoral studies in the Geography Department at the University of Michigan carried the study of recreation as a local industry one step further.[1] They represented an attempt to estimate the added income accruing to the local economy as a result of recreational use. The two studies added to the general body of knowledge of the impact of recreation on a local economy. They applied a common approach to a transitional county in the Lower Peninsula in which agriculture was still the dominant activity and to a wildland county in the Upper Peninsula in which timber and the forest products industries were the mainstays of local economic life.

Pearson's study may be used to illustrate the method by which the economic significance of recreation was measured. Pearson measured the economic contribution of recreation as the sum of three types of income, namely, income from retail sales, income from the sale of services, and income from the property taxes on recreational lands. The concept of income used in all these three classes of payments was gross receipts. This method went beyond that of Hedrick by providing an estimate of business returns as well as government returns occasioned by recreational activity.

Pearson's main source of information on business receipts was government records, rather than the records of either the individual businessmen or the recreational consumers themselves. Information on retail sales by month of the year and by class of retail establishment

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[1] Ross Norton Pearson, "Recreation and its Significance in the Economy of Ogemaw County, Michigan," (Unpublished Ph.D. dissertation, Dept. of Geography, University of Michigan, 1954) and William R. Brueckheimer, "The Significance of the Recreation Industry in Alger County, Michigan," (Unpublished Ph.D. dissertation, Department of Geography, University of Michigan, 1954).

was available from the Michigan State Sales Tax Commission. Information on service trades was taken from the 1948 Census of Business of the United States Bureau of the Census. The major problem to solve was the allocation of the correct proportion of retail sales to recreation. Both Pearson and Brueckheimer plotted curves showing per capita sales by months in the year. The trend of these curves reflected markedly the buying of summer and fall visitors. Similar seasonal curves for non-recreational counties showed no similar bulges in the vacation season. It was therefore inferred that the excess of sales in the summer months in Ogemaw and Alger Counties over the winter months could be regarded as the increase of sales attributable to recreation. The peaks of the seasonal curves were more pronounced for recreation-senstive lines of business, such as sporting goods establishments, eating and drinking places, and variety stores than they were for the sales of general stores and filling stations.

Pearson estimated that the retail sales to recreationists were 10 percent of all retail sales in Ogemaw County in 1950. Brueckheimer estimated the recreationists' share of retail sales in Alger County in 1951 to be 16 percent. Pearson's final tabulation of "Income From Recreation" came to a total of a little over 1 million dollars, of which 73 percent was income from retail sales, 22 percent income from sales of services, and 5 percent receipts of local government units for property tax or State government payments in lieu of property tax. Pearson observed that the income from the sales of agricultural products in Ogemaw County at the farm in 1950 was 1-3/4 million dollars, and concluded that recreation was an important but not a leading activity in

the county. Brueckheimer similarly was influenced to the view that in Alger County the shortness of the recreational season and the absence of full-time employment for any of the individuals who benefitted from it weighed heavily against regarding it as of primary economic importance. He was convinced that "timber cutting and processing remained the basic industries in the county," although only three wood-using plants remained open in the county.

Hunting and Fishing

The economic importance of wildlife, of animals existing in the wild state, covers a greater range than the economic importance of wildlife in its recreational aspects. King provided an inclusive list of the values of wildlife which suggests the difference of the two concepts.[1] On such a broader view, the value of wildlife would include returns to trappers from the sale of the pelts of wild animals and also the income from commercial fishing and from fur and game farming. In addition to these readily appropriable sources of income from wildlife, there would be such other items as the pollination of clover seed, insect and rodent control furnished gratuitously by wild creatures, and a wide and important variety of esthetic, social, recreational and scientific values, many of which defy an accurate accounting. King listed such social values as improved mental and physical health, income from otherwise idle lands, and increased real estate values.

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[1] Ralph T. King, "Forest Zoology and Its Relation to a Wildlife Program as Applied on the Huntington Forest," Roosevelt Wildlife Bulletin, Vol. 7 (1941), p. 469.

Attention in the present study is restricted to the portion of this spectrum of wildlife values which is colored with a recreational tinge. Of particular interest in this connection are studies which have measured the economic importance of game and fish in terms of the money spent by hunters and fishermen. The way in which these expenditures have been estimated is by interviewing a sample of the population of hunters and fishermen in a state and making the appropriate inferences as to the behavior of the entire body of anglers and hunters. In most of these surveys, fairly refined techniques of questionnaire construction and random sampling have been employed. Pretests have been made of the schedule of questions and follow-up interviews have been made in the case of those who failed to respond to the mail questionnaire. Weighting factors have been employed to make the samples representative.

The classes of expenditures recognized in these studies of the sportsman as consumer cover a very wide range. They include such items as nominal payment of a license fee for the privilege of hunting or fishing, the payment of sporting club dues, and the cost of magazines dealing with hunting and fishing. The Massachusetts survey included expenditures for not only the conventional armaments of field and stream but extended to the supplies for such urbanized or land-intensive pursuits as skeet, trap and pistol shooting.[1] This study covered clothes and footwear for land and water, and included means of transportation,

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[1] Lawrence H. Couture, Seventy-four Million Dollars a Year, Just for the Fun of It. Massachusetts Division of Fisheries and Game, 1954, p. 8.

extending all the way from the boat and outboard to the pedestrian snowshoe. It plied the sportsman with questions as to the cost of lodgings and meals, transportation, and "refreshments." Dogs and their care were another sizable item covered in the Massachusetts survey.

The Idaho survey covered approximately the same list, with a somewhat more modest approach.[1] "Special Fees and Leases" was an item close to the land use itself; "Cameras and Camera Supplies" was one which is on the margin. The North Carolina project supplied the added category of expenditures for guides. On the investment side, it brought in the payments to farm pond contractors.[2]

In several of these state-wide expenditure surveys comparisons with other forms of economic activity have been offered. Such comparisons tend to emphasize the significance of the findings provided that they have been soundly drawn. The North Carolina study compared expenditures in the pursuit of wildlife with the value of agricultural crops. A comparison was also made with the value of timber products delivered to the processing plants and with the value of mineral production. Wallace argued in the Washington state study that the comparison of hunter expenditures with the value of crops at the farm level was the appropriate one because in both cases the value was being measured at the point at which the product left the land.[3] It seems that these comparisons

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[1]Willis C. Royall, Jr. Multilith letter to Mr. Ross Leonard dated April 14, 1954, on Idaho Wildlife Resources Survey.

[2]Howard J. Stains and Frederick S. Barkalow Jr. The Value of North Carolina's Game and Fish, (North Carolina Wildlife Resources Commission, Raleigh, 1951).

[3]Robert F. Wallace. Economic Aspects of Wildlife Resources of the State of Washington (Pullman, State College of Washington Business Studies Bulletin No. 19, 1952).

are in need of further examination. The fact that two quantities are expressed in terms of dollars does not so readily make them subject to a fair comparison as might seem to be the case.

No consumer survey among sportsmen comparable to those described above has been carried out in Michigan. An attempt at economic evaluation of wildlife benefits is found in the note published each year jointly by the Cooperative Extension Service and the Game Division of the Michigan Conservation Department on the value of the game and fur crop for the year.[1] The fur harvest is valued in terms of the value of pelts taken and the game crop in terms of the estimated value of the meat in animals taken by hunters. All game species are valued at 75 cents per pound, with the exception of the rodents from the woodchuck down, which are valued at 25 cents. On this basis, pelts came to 1 million dollars in 1954 and edible meat from game animals and birds to nearly 8 million dollars.

Craighead's appraisal of the Jackson Hole elk herd of Wyoming reflected a similar attempt to measure the economic contribution of game in terms of the meat on the carcasses of the annual kill. Following this approach, Craighead concluded that a smaller number of elk was worth more than a larger number of cattle with whom they shared a summer range in Jackson Hole.[2] He valued the elk at 50 cents per pound hog-dressed and the cattle at 25 cents per pound alive in the wholesale markets. The local elk industry was held to be more valuable than

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[1] Charles Shick, "Value of Michigan's 1954 Game and Fur Crop" (Co-operative Extension Service, Michigan State College and Michigan Conservation Department, Lansing, 1955).

[2] John J. Craighead, A Biological and Economic Appraisal of the Jackson Hole Elk Herd (New York: New York Zoological Society and the Conservation Foundation, 1952).

the cattle industry both in total dollar value and in the number of Jackson Hole residents in whole or in part dependent on it for a livelihood.

A few investigators, aware of the economic losses attendant on the maintenance of high populations of game animals in districts with other important resource values, have directed their attention at measuring the losses occasioned by game animals. Thomas, at Pennsylvania State, estimated crop losses and other damage by deer and deer hunters sustained by farmers in two Pennsylvania counties in 1951.[1] At the same time, Thomas gathered information from a sample of hunters on their expenditures for hunting and the upkeep of hunting camps. From a sample of farmers he estimated the benefits they received from hunting and hunters. In the county in which deer damage to crops was the greatest, 60 percent of all farms had some damage from deer and the loss in the damaged portions of fields amounted to over 5 percent of the total farm value of field crops grown in the county that year. In Potter County, damage to crops, fences, and livestock amounted to $148,000; gross income to farmers from hunters for lodging, board, and the like was $45,000, not counting the farmers' costs of providing such services to hunters. Farmers also were hunters. One-quarter of them killed a deer for damaging crops and a larger number killed deer for consumption.

In the State of Wisconsin, the effects of deer browsing on commercial tree reproduction were surveyed during the period 1946-48

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[1]Donald Woods Thomas, "An Economic Analysis of Deer Damage to Farm Crops, and Income from Deer Hunters, Potter and Monroe Counties, Pennsylvania, 1951," (unpublished Ph.D. dissertation, Dept. of Agricultural Economics and Rural Sociology, Pennsylvania State University, 1954).

on lands under management for timber production. Measurement was made in terms of the physical depletion of the stand of reproduction and no express dollar valuation was attempted. It was found that only one-half to three-quarters of the minimum necessary stocking of young growth remained in good condition after browse injury by deer.[1] On the National Forests of Wisconsin, it was estimated in 1943 that damage to plantations and natural reproduction during the preceding 10-year period totaled $547,500.[2]

Timber

The literature dealing with the economic contributions of the timber and timber product industries is less abundant than that concerned with evaluating game, fish, and wildlife resources. James has approached this problem from the standpoint of estimating the income arising from timber cutting and processing for the State of Michigan.[3] The total income attributed by James to the timber industry was made up of both "raw timber products" (whole or slightly modified logs and bolts before manufacture, plus bark, stumps and crude gum) and "timber manufactures" involving the further processing of raw timber products not directly consumed.[4] Income from raw timber was reckoned as the total

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[1] Ernest Swift, "Wisconsin's Deer Damage to Forest Reproduction Survey--Final Report," (Madison: Wisconsin Conservation Department Publication No. 347, 1948).

[2] Ernest Swift, A History of Wisconsin Deer, (Madison: Wisconsin Conservation Department Publication No. 323, 1946), p. 84.

[3] Lee M. James, "Timber Values from Michigan's Forests," Quarterly Bulletin, Michigan Agricultural Experiment Station, Vol. 34, pp. 275-84, February 1952.

[4] Lee M. James and James G. Yoho, "Income from Timber Products in the United States," Journal of Forestry, Vol. 51, February, 1953, pp. 83-87.

value of raw timber less the value of raw timber unsold. Income from manufactures was regarded as that part of the value added by manufacture which covered wages, salaries, and net profits.

The valuation of raw timber products was made at the point of processing or consumption, before manufacturing, in terms of the total quantity produced and the average value per unit. The income arising out of manufacturing was not computed in this way, but instead was taken largely from the statistical aggregates presented in the Federal Government Census of Manufactures. The industry groups included in manufacturing were those listed by the Census under the following headings: lumber and products (except furniture), paper and allied products, wood house furniture (except upholstered), wood office furniture, and gum and wood chemicals. James estimated that the 1948 money income attributable to timber products in Michigan was 317 million dollars, of which 66 million dollars was the value of raw timber products. These figures did not include the non-monetary returns of farmers for farm-used fuelwood and posts and custom-sawed lumber not sold, which would have amounted to another 25 million dollars of value.

Other Wildland Products

The resource-use patterns in different parts of the United States have their similarities and their differences. It may be well to consider several resource evaluations from sections of the country which have somewhat different problems from those of Michigan. The methods used in these studies may have a possible application to Michigan conditions and resources.

Problems of evaluating rural land use patterns in the western mountainous sections have been receiving attention at the University of California for a number of years.[1] Lammi's recent doctoral dissertation at that institution aimed for depth in the making of wild-land resource comparisons by limiting the scope of investigation to measuring the primary income resulting from two competing uses of land in the mountains of Utah, namely, livestock forage and water.[2] "Primary money income" was measured at the stage where the goods and services had passed through the first processing enterprise.

> The "first processing enterprise" changes the form of the primary product. Water is changed to farm crops, livestock forage into ranch products, timber is sawed into lumber, recreational opportunities are made available to people who wish to enjoy them, and game forage is converted into meat in the possession of hunters.[3]

The income which accrued at further stages to suppliers of materials, transportation firms, processors, wholesalers and retailers was regarded as "secondary income" and was excluded from consideration. Similarly, "intangibles" which did not lend themselves readily to monetary measurement, even though they might be of great concern to the local community, were excluded from measurement.

Community income was regarded by Lammi as the sum of incomes to private individuals, firms, and public agencies. Lammi's aim was to transfer the principles of national income accounting to the community

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[1]David Weeks and H. R. Josephson, "Economic Criteria for Classifying Non-Urban Land According to Probable Best Use," Journal of Farm Economics, Vol. 21 (May, 1939), 419-34, typifies this interest.

[2]Joe O. Lammi, "Primary Money Income from Range Watersheds," (unpublished Ph.D. dissertation, Dept. of Agricultural Economics, University of California, 1954).

[3]Ibid., p. 39.

level and to make an accounting at the ranch level rather than at the retail level. Lammi showed how his approach could be made a tool of analysis for assessing proposed changes in land use. By applying measurements to three alternative sets of production estimates for a Utah watershed, he provided a specific illustration of how such a measurement technique could be made serviceable for specific planning purposes.

Summary and Discussion

This brief review of pertinent literature brings out a number of the possibilities and problems involved in measuring the economic importance of wildland resources. It provides insight into the differing economic characteristics of particular forms of wildland use. It illustrates the effect and importance of the geographical frame of reference adopted in evaluation. It throws light on the sources and classes of data which may be drawn upon to make the required economic measurements. And, it provides examples of faulty economic reasoning and misleading comparisons.

What are some of the main differences among the uses which arise out of this brief review of the literature? On the recreational side, a leading feature is the prevalence of goods and services which have value but no price, as fleeting as the sunset or a startled deer when one attempts to pin a price tag of some contrived kind upon them.[1] It is erroneous to impute a value to wild meat, whether it be to elk in Wyoming or to the wide range of game and fur-bearing animals of Michigan. The pursuit of game animals is a matter of sport and assumes

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[1]This point is well put by M. L. Upchurch, "Economic Factors in Western Range Improvements," Journal of Farm Economics, XXXV (Dec., 1953), p. 736.

the proportions of a subsistence-type activity only in the case of the local residents of the game-producing sections. Respondents to Lefes' questionnaire to a large sample of successful deer hunters in two Pennsylvania counties in 1951 minimized the importance of venison as a goal in hunting. Over 80 percent of those responding named sport in hunting as their reason for hunting deer. Only 13 percent acknowledged that they went deer hunting chiefly to get a deer or use the venison.[1] Since under ordinary conditions it is illegal to sell wild meat, there is no adequate market opportunity to define what the value of this meat would be. The successful hunter may justly claim a visible return from his recreation, as may the productive home craftsman, but it is wrong to class such products as income in the sense in which we must necessarily understand that term.

The measurement studies reviewed differ in the size of the area to which they are intended to apply. The limits set may be those of a single watershed (as in Lamm's study of forage and water in Utah), a single county (as in the recreational land use studies of Pearson and Brueckheimer), a state or major portion of a state, or the entire country. The decision as to the size and political and physiographic uniformity of the area chosen for study may have a very significant influence on the techniques chosen for making the study.

The size of the area chosen affects the point of view taken in measuring benefits. What may be a benefit from the standpoint of a

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[1] William S. Lefes, "The Sociology of Deer Hunting in Two Pennsylvania Counties," (unpublished Master's thesis, Department of Agricultural Economics and Rural Sociology, Pennsylvania State University, 1953), p. 81.

local community may simply represent a transfer payment from other communities rather than the creation of truly new wealth. Looking at things entirely from the standpoint of the local community is only one of the possibilities open to an investigator. In the case of a study of a larger unit area, such as a state, the stress on purely local benefits found in the studies of Lammi, Pearson, Brueckheimer, and others is apt to be misleading.

The treatment of sales at retail is another area where some straighter thinking is needed. National income originating in wholesale and retail trade is only a fraction of the volume of such sales. Particularly is this true of the sales of a local community or of a state. Much of the cost of such sales will accrue to producers outside a community or state; in all cases a sizable part of it will take the part of non-factor payments not to be included in income, properly speaking. It does not lead to a very satisfactory total to add retail sales to tax levies on resort land and to wages of itinerant carpenters, as is done by Pearson in his otherwise very estimable study of recreation in Ogemaw County. Completely inadmissible is the practice of capitalizing gross retail sales to get the capital value of the recreation industry.

The treatment of property tax revenues and appreciations in the capital value of recreational properties also needs clarifying. In a statewide framework, greater tax levies in recreational counties do not necessarily increase income. Income is increased only if government provides more services than formerly. Otherwise, there has just been a redistribution of tax burdens. Capital gains which are caused by

land investments, like roads and drainage, are counted as income when the investment is made. It is not correct to count the resultant gains in property value as well. Unearned increments proper are not to be regarded as income either; they represent no current addition to the stock of valuable things in existence.

This literature review also points to the main sources which may be drawn on in measuring economic importance. In general, reliance must be placed on government statistics and records, the records of business enterprises, and the recollections and judgments of individuals. The most important of these sources are the records of government. Many of these records are by-products of the taxing activities of government. Administration of the general property tax requires that land and its improvements be assessed and listed on the tax rolls. Extensive information on retail sales is compiled in connection with the administration of a retail sales tax law. Payroll taxes levied under the social security program provide detailed and current information on the compensation of employees. Through its periodic censuses of manufacturing, trade, agriculture, population, and housing, and through its annual summarization of the national income and product, the government makes available information which is of great value in assessing economic importance.[1]

Business records, by comparison with those of government, lack comprehensiveness, but often provide graphic detail. Thus, Pearson used the shipments of currency by an Ogemaw County bank as a rough index of the expenditures of tourists. He drew on the records of the power company to estimate the number of summer cottages in the county. The

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[1]See the Appendix for a selected list of sources of data.

records of individuals are notoriously sketchy and fallible. However, the technique of consumer survey on the basis of a stratified, random sample is relied on quite generally in studies of consumption here and elsewhere in the economy. This is the method employed in the studies of the expenditures of sportsmen and vacationists.

Some of the major confusions which arise in seeking to compare the returns from timber and recreation result from the special characteristics of land and the part it plays as a limiting and critical factor. The other source of uncertainty comes from a failure to think clearly about the real nature of income and wealth. Consideration must, therefore, be given next to some fundamental concepts in the economics of land. Principles concerning the measurement of wealth and income will be dealt with thereafter.

III. CONCEPTS IN LAND ECONOMICS

An attempt to measure the economic consequences of alternative uses of land demands an understanding of the economic characteristics of land and a knowledge of the nature and measurement of income. It is well, therefore, to pause at this stage and consider the nature and economic characteristics of land, one of the great enlarging yet limiting factors with which man's genius must work. Then, before preparing a means of measuring the incomes from land use, it will be well also to describe the wildland economy of Michigan and to set forth the principles of modern-day national income accounting as it is employed in the countries with mature industrialized economies.

Land as Habitat

The relationship between man and the land he inhabits is one of the most fundamental relationships in life. Whether industrialized or primitive in his technical attainments, man is bound to the land in a thousand ways -- biologically, economically, and spiritually. In common with all other forms of life, man depends on the land for habitat, a varying combination of environmental and territorial characteristics which conform to his biological and cultural needs.

A growing mastery of land and the forces associated with it has not liberated man from dependence on the land. In some respects it has increased the extent of his dependence on the land and its resources. Into the construction of articles of every day use and as part of the daily bill of fare enter products of the land from every corner of the earth, products often highly specific and localized in their

geographic and climatic origin. Spiritually, also, man is still an earthbound creature. Love of the land is one of the roads by which he may aspire upwards and add meaning and beauty to his daily existence.

Zimmermann characterizes human wants as nature wants, on the one hand, and culture wants on the other.[1] Nature wants refer to those fundamental needs which all men share with each other and with the rest of life. Culture wants may be no less intensely felt, but these are likely to vary from place to place and from time to time. As an individual or a society grows richer, there is scarcely any limit to the culture wants which may be elaborated and built into the image of the life which men deeply long for. Under the conditions of modern life in an industrial society, the fundamental needs for food, clothing, shelter, and living space are largely met by the domestic rather than the wildland economy. Timber seems the most important exception to this statement, inasmuch as it provides a significant portion of the structural materials for human habitation. It seems more accurate to class the need industrial man feels for the wildland environment as a culture want. Perhaps he needs to take "cover" to seek shelter from the complexity and strain and monotony of the social situation in which he lives, but such refuge is a culturally dictated response to a culturally originating difficulty. The prairie-dweller feels no impelling need for forest environment or the wild grandeur of the mountains. Instead, he complains of a shut-in feeling and longs for his wide-open spaces which, it must be admitted, have at times a wonderful quality of wildness of their own.

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[1] Erich W. Zimmermann, World Resources and Industries, (Rev. Ed., New York: Harper and Bros., 1951), Ch. 2.

The mastery of man over nature is that of a master who knows the secret of commanding only the possible. Human life nonetheless operates within a framework of natural principles which it shares with the rest of creation. The face of the earth is given to man and there is little that he can do to alter it with his noblest or ignoblest works. Each portion of the earth has its own configuration and its own complement of access to sunshine, rain, and warmth. Venturesome outriders may occupy the South Pole or Everest for intervals; but the habitable portion of the earth as yet remains restricted. At some point we know that there is a carrying capacity for mankind as well as for other forms of plant and animal life.

Land as a Factor of Production

Land is an essential ingredient in economic production. It provides both the material resources which enter into the productive process and the physical site on which such production may be accomplished. Along with human effort (in the form of labor and management services) and with capital (the joint product of past contributions of man and land), land enters into the production of all new wealth.

The active role of land in production is nowhere so evident as in the classic case of agriculture. The strategic importance of land as a factor of production is no less striking in the production of mineral wealth, localized and concentrated on restricted portions of the earth's surface. Other forms of production require land as *situs*, as a place of business, be it factory, store, means of transportation or communication, or establishment providing meals or lodgings. The services of land must be secured in all these forms of undertakings.

Land differs from the other factors of production in its durability and in its immobility. Because of its fixed and inalterable position, land is incapable of flowing, as labor and capital may readily flow to the place where the highest returns for its services can be had. Instead, all economic activity must adapt itself to the fixed location factor and economic production is thereby characterized by a further dimension of space.

The products of land include both goods and services. Among the products of forest lands are such goods as sawlogs, power poles, animal pelts, and such services as a place to build, a chance to hunt, and sights to enjoy and be recreated in. The goods are capable of being severed from the land and transported to varying distances for the satisfaction of their ultimate consumers. Wildland products, like furs and logs, may, if their value is sufficiently high, be shipped across the world to form a part of the consumption of people who have never seen the spot wherein the tree grew or the river in which the beaver built his house. The recreational services of forest land, by contrast, are not detachable from the land which produces them. To enjoy these services the consumer must transport himself to the forest and enjoy them there in place. Photographs and motion pictures may be made of the wildland scene, recordings of the notes of songbirds may be made, but the possibilities along these lines are extremely limited. The wildland world must be entered to be enjoyed. The non-resident enjoyer of forest lands must become a tourist, with all the accompanying economic effects of that necessity.

Money Income vs. Direct Utility

The forest products which consist of physical goods are commonly produced for the market and are sold. The products of forest lands which partake more of the nature of services are sometimes sold, as in the case of sales of shooting rights, leasing of deer camps and the like; but are more commonly enjoyed directly by their owners and others without being made the object of a business transaction. The object of ownership is more commonly enjoyment than commerce, consumption rather than production.

Modern economic life is characterized by a sharp separation between producer and consumer. A man operates in the sphere of production largely to secure money income with which he may then secure the goods and services to minister to his consumption needs. He produces in order that he may consume or accumulate wealth. At the same time, he must strike a balance between production and consumption. The question, therefore, arises: How much production and how much consumption? At what point shall a man cease to use his resources of time, energy, land, and other forms of capital for the purpose of producing money income and begin to use these resources directly for his own enjoyment? When shall a dentist decide to stop filling teeth and take the afternoon off to go fishing? When shall a farm family purchase a television set instead of a heifer?

A society faces similar choices in resource use. To what extent shall it use its resources for commodity production and to what extent shall it set aside resources for the direct enjoyment of the people? A city must decide how much of its limited supply of high-value land to

devote to parks and playgrounds and how much to commercial and industrial purposes. A decision as to whether or not to build the Echo Park Dam hinges on a choice between scenery and archeology on the one hand and irrigation water and electric power on the other. In similar fashion, forest land may be devoted primarily to recreational uses by people or it may be managed with primary emphasis on the production of commercial timber. Societies like individuals must strike a balance between work and leisure, between using resources for income as compared with using them directly for enjoyment.

But, there is no sharp dividing line between production and consumption, no aura of moral superiority attached to productive as opposed to direct use of resources. The purpose of production, after all, has always been for the sake of consumption, sometimes round-about and deferred, but nevertheless ultimately to serve the needs and ends of men. When choice timber trees are sawed into lumber which is used to make fine furniture valued for its elegance of grain and styling, a wildland resource is being pressed to serve human enjoyment in a like manner as when a hardwood grove is preserved for environment in connection with an imposing rural residence or a scenic motor road or hiking trail.

Property Rights in Forest Goods and Services

The degree to which the wildland products and services lend themselves to being owned is partly dependent on their intrinsic nature and partly dependent on legal arrangements governing their possession and use. A portion of the wildland resources is migratory. This is the case with water and with the forms of animal and bird life which may

originate on one unit of wildland but be utilized or enjoyed on another. The migratory resources are customarily subject to special legal arrangements regarding their ownership. The fixed and non-migratory wildland goods are reduced to ownership in the customary fashion. They are typical land resources over which control of the earth's surface gives possession.

The use of water is governed by doctrines of rights. No distinction is made in favor of owners of water-originating lands as compared with owners of water-using lands. Under the traditional riparian doctrine, surface water rights are limited to owners of land which abuts on the bodies of waters. Use is limited to specified purposes under the restriction that the flow of water be not thereby diminished in quantity or quality. In the western states, prior rights to the use of water are recognized and these rights are inherent in the ownership of stated parcels of land. These parcels are not, it is to be noted, by any means the land from which the water arises. The owner of wildland watershed property may have no valid claim to the water which is produced by his land.

Wild animals and birds in a free state belong not to the landowner on whose land they happen to be domiciled, but instead are the property of the state. The wild creatures are subject to capture in carefully prescribed ways and no other. Their reduction to individual possession is on a rationed basis both as to numbers and time of capture. Here, again, as in the case of water, the nature of the situation and the laws which apply make it impossible for the landowner fully to appropriate the wild product of his lands. He may deny to others the right to hunt on his lands or may make a charge for that right. But, he

cannot prevent the water or the game from moving off onto another person's property.

Complete appropriation of the scenic values of wildland by individual owners is similarly difficult of accomplishment. The possibility always exists that the wildland scene may spread its beneficence somewhat beyond the limits intended by the owner of that beauty, particularly at the borders of his land. The interior values can be more successfully preserved inviolate to the enjoyment of the owner if he so desires. Scenery also is hard to own.

The argument for public ownership of portions of the wild lands gains force from the lack of appropriability of these migratory and aesthetic resources. Since the benefits are widely diffused throughout the community, why not vest ownership in the community also? The necessity for public ownership is particularly evident at stages in economic development, or at periods of the business cycle when there are no returns in sight which make the land of interest or value to private owners. The public can also provide stability of production from these lands by a procedure of dedicating them to specified uses and withdrawing them from future disposal. Uses dependent on extensive areas of contiguous land may be blocked out under the authority and with the financial means of the state more readily than under the changing impulsions of private ownership.

Short of ownership by the public, there are other forms of social control of private wildland property which may be invoked to promote public purposes or to prevent damage to public interests. One important example of these social controls is land zoning. Zoning regulations in

wildland areas enhance and conserve wildland values. They direct land use away from unsound uses not in keeping with the physical capabilities of the land. Zoning may be used to discourage disorderly and haphazard patterns of settlement which would add disproportionately to the costs of providing roads, schools, and other public services. Zoning forbids certain uses, but may not require that land be used in any prescribed way. Within a zoned county, there may be zones where new full-time residential use is prohibited, others where forestry use for timber production is prohibited because of the priority of recreational values.

Economics of Forest Land Location

Geographic location is an extremely potent economic factor with a pervasive influence on the distribution of income and wealth within a nation and among the nations. It has been held to be the dominant force in the differential rate of economic development of American regions.[1] A good location can sometimes compensate for the absence of a host of natural advantages. A poor location is often sufficient to doom some otherwise very favorable resource situations and combinations to little or no economic utility.

Industries differ as to their locational requirements and characteristics. Industries which work with bulky raw materials of low value in proportion to their weight are tied locationally to the place where these materials occur. Industries which produce high-value items with much of the value added in processing are likely to be found in close proximity to the major marketing centers for the products involved.

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[1] Theodore W. Schultz, "Reflections on Poverty within Agriculture," Journal of Political Economy, LVIII (Feb., 1950), 1-15.

As a generalization, the early stages of production are often oriented to raw materials; the later stages of production are oriented to the market; and the intermediate stages of production tend to be footloose in their orientation. They can go either way.[1]

The forest products and services illustrate such a locational framework. Sawmills are characteristically closely tied to the saw-timber lands. Veneer mills, working with a higher value material and product better able to stand transportation, may draw raw materials from a larger circle than do sawmills. Pulp mills are ordinarily located in close proximity to at least a substantial proportion of their supply of pulpwood. Paper mills, being a step further from the raw material and a step closer to the market, are much less dependent on having a location adjacent to the forest raw materials. Paper-converting plants, finally, are likely to be specifically oriented to market. Integrated operations, where all these functions are combined within a single firm and at a single site, occur at a location which reflects some compromise between the requirements of materials and market alike.

Geographic location in itself does not exhaust the factors accounting for the occurrence of industries in the places where they are found. Besides the transportation costs which result from varying locations, there are differences of processing costs in different places which may offset the effect of transfer costs. Skilled and industrious labor is one such factor, the presence of supporting

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[1]Edgar Malone Hoover, The Location of Economic Activity, (1st Ed., New York: McGraw-Hill Book Co., 1948), Ch. 3.

industries and trades is another; together these factors probably reflect the advantages of an early start, as in the case of Detroit and automobiles, Akron and the tire industry.

If forest industries represent a combination of materials and market factors, the recreation industry is by contrast 100 percent materials- or land-oriented. As has been suggested, its products can not undergo any transportation but must be consumed in place by the ultimate consumer. In this respect, it is even more restrictive than the education industry, which can foster off-campus centers and offer correspondence and television courses; or the opera industry, which can make recordings, offer radio memberships, and carry out annual tours to the hinterlands.

Although forest recreation represents nearly a pure case of an exclusively materials-oriented industry, this is not to say that there are not favorable or unfavorable locations, or that proximity to large concentrations of the consuming public is not of a large and even decisive importance. In fact, the value of recreational land and the income it produces and induces is closely connected with its accessibility. Its value reflects both its location and its intrinsic quality. Such land has value because it produces either money income or direct satisfactions. The added transportation costs and burdens of remote land detract from the net income in either money or satisfactions which the land can produce and therefore reflect unfavorably on its capital value.

Although land may be looked upon as a free good supplied to man by a bountiful nature, land which is economically valuable is an

investment. It is an investment because it is capable of yielding a flow of incomes and because it has a capital value. But, it is an investment also because it has money tied up in its production. The wildest of land to have value must at least have access provided to it. Not only natural advantages of fertility and location and terrain contribute to the value of land. It is in a very real sense a produced good which has physical development costs incorporated in its value, and also certain important time costs relating to the time which elapses before the receipt of income. The development of a summer resort in a forested area illustrates abundantly that wildland is an investment.

The Competition of Land Uses

Under conditions of perfect competition the allocation of land, in common with other resources, is controlled by the pricing system. Each piece of land is used in such a way that it brings its owner the optimum return. The use-capacity of particular pieces of land reflects both their intrinsic quality and suitability for particular uses and also their locational characteristics. One other factor which works along with these two is land development. A forest with an access road serving it and interior logging roads and fire protection improvements in place has more value for forestry use than a similar piece of land without these improvements. Land around a lake with no road has only speculative value compared with land around a lake which has access and other improvements, although its recreational attractions may be no greater. Such improvements add to the capital value of the land, whether their cost is borne by the landowner or not.

The price of land, however, is not synonomous with its cost of production. Once made, development improvements are sunk costs which do not of themselves command or justify a price. Price expresses instead what a willing buyer is willing to pay. There is no standardization of land and every piece differs somewhat from every other. In order to have the services of land for any particular purpose a buyer must pay at least what the land is worth in its highest alternative use. A family wanting to live in the country on a small holding must pay at least what the land is worth for agriculture, plus a premium for subdividing, inducing the farmer to make a shift and the like. A hunting club purchasing a campsite must pay at least what the land is worth for forestry.

A more realistic approach to the competition of land uses must take account of the indisputable fact that perfect competition does not prevail in the forest land market in Michigan. The large share of government ownership which characterizes the land ownership pattern has at least two important effects on the land market. Much of the government-owned land is "dedicated" to permanent government ownership and seems to be permanently removed from the market. As a source of timber, there is a dependability and permanence and continuity of policy which offers to wood-using industries some, at least, of the advantages of ownership. As a source of publicly provided recreational opportunities, the presence of this large body of government land obviates the necessity of ownership on the part of the large body of recreationists. It makes it difficult, if not impossible, for private owners to make charges for recreational-use privileges, even were they minded to do so. The

government land gives intermingled private recreational ownerships a surround of wildness which adds to their value and is accordingly capitalized into it. In the long run, however, and given a rising tide of recreational use, the existence of so much government land not on the market has a tendency to increase the price of the rest by keeping the supply fixed in relation to an increased demand.

More common than the exclusive use of a piece of wildland for a single product or service is the practice of making the land yield two or more products and services. Under the well-known but sometimes ill-defined banner of "multiple-use," many of our public wildlands are managed for several concurrent but not always harmonious objectives. This is at once an economic and a political question. In some of the instances where emphasis of a single use would be more economic, attempts to integrate a number of uses are more expedient, more in keeping with the spirit of our democratic institutions in the recent formulation of the Chief of the U. S. Forest Service.[1] Support for vast public undertakings in wildland is too precious and delicate a thing to be lost by provoking avoidable conflicts with special interest groups.

Whether the doctrine of multiple use is carried to the point of seeking all the uses on every acre or unit of wildland, or whether the uses are parcelled out among the units of wildland, there remain the stubborn and underlying use relations which goodwill and aspiration and generous hope can scarcely alter. These underlying relationships have

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[1] Richard E. McArdle, "Multiple Use - Multiple Benefits," Journal of Forestry, Vol. 51, (1953), 323-25.

to do with the compatibility of the differing uses at various levels of output. Some of the production relationships between deer and timber will serve to illustrate a portion of the possible use relations which occur.

It has been found in certain patchy and scrubby stands of aspen in Michigan that the removal of the scrub by prescribed burning or by discing results in a heavy crop of aspen reproduction from root suckers, giving promise of a better stocked future forest than did the one which was removed. At the same time, browse conditions for deer are improved and there seems to be enough new growth to provide added food for deer and still leave a desirable stand of forest regeneration. If it may be assumed that browsing is actually beneficial to the new forest stand, there is complementarity between deer production and timber production. One use adds to and completes the other. It is known that logging produces favorable habitat conditions for deer. The large deer populations of recent years are attributed in large measure to the widespread logging of a number of years ago and to the general prevalence of fire protection. Both logging and fire protection conduce to maximum forest production. On a broad scale, we may therefore reason that there exists a type of complementarity between logging and deer production, deer being symbolic in this context of enhanced recreational use values. Cook reports an interesting instance of receiving help from deer in his efforts to convert cutover hardwood lands in Rensselaer County, New York, to coniferous forests by planting larch and spruce. The essential operation of cleaning the plantations of hardwood sprouts a year or so after planting was greatly facilitated by the summer browsing deer, whose food preferences

fitted in admirably with the silvicultural requirements in the situation.[1]

But, it must not be imagined that deer and timber are always and everywhere compatible to the extent suggested by these few examples. The opposite situation is indeed much more the typical one. It is such conflicts which give rise to the land-use problem with which we are here concerned. Forests quite readily work themselves into forms which are favorable for timber production but unfavorable for deer. Graham sees this situation occurring at the present time in the western part of the Upper Peninsula of Michigan, in part caused by forest succession and in part by the overbrowsing of the deer herd itself. In this he sees more ultimate harm to the deer herd than to the timber forest, since the abundance of hard maple reproduction seems to assure a future forest, whatever may be the fate of yellow birch and basswood.[2] Swift of Wisconsin is more disquieted by the evidences of overbrowsing of deer on tree reproduction of the commercial species. He questions the wisdom of jeopardizing the future raw material supply of Wisconsin's vital pulp and paper industry for the sake of a few more deer in the present.[3] The deer are as content with planted trees as with the natural growth. Twenty forest plantations out of 60 examined in Wisconsin between 1932 and 1938 showed over 25 percent of the trees destroyed or damaged. In Pennsylvania, forest planting activities at an earlier period were made practically impossible in certain sections

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[1] David B. Cook, "Summer Browsing by Deer on Cutover Hardwood Lands," Journal of Wildlife Management, Vol. 10, (Jan., 1946), 60-63.

[2] Samuel A. Graham, "Changes in Northern Michigan Forests from Browsing by Deer," Transactions of the Nineteenth North American Wildlife Conference, 1954, pp. 526-33.

[3] Ernest Swift, "Wildlife as a Forest Crop in the Lake States," Proceedings, Society of American Foresters Meeting at Minneapolis, 1947, (Washington: Society of American Foresters, 1948), p. 486.

by the feeding of an excessive deer herd.

The deer conservation problem is one of a competition between time periods. Over-population of deer leads to range impoverishment and destruction and thereby a reduced carrying capacity for deer. Food plants and cover plants both are needed to provide the nourishment requirements and shelter from the winds of northern Michigan. The most severely limiting factor appears to be the winter deeryards where the deer cluster in winters of deep snow in the Upper Peninsula at the present time, although they are reported to have migrated southwards before the advent of highways and railways. Destruction of winter habitat is one of those critical processes in the conservation of biological resources which it is hard to reverse economically. Too many deer now may mean a permanently lowered carrying capacity for deer in the future.

IV. THE WILDLAND ECONOMY OF MICHIGAN

Wildland in Michigan can usefully be regarded as all land which is not in urban areas and which has not been improved for industry, agriculture, or residence, or devoted to transportation and communication rights-of-way and other service uses.[1] Wildland thus comprises all woodland and all other rural land not suitable for farming, including marshes, sand dunes, and bare rock. Land contained in villages under 1,000 in population and other rural built-up areas, such as schools, institutions, and factories would represent an additional but difficult to measure source of deduction from the wildland side.

Such a definition of wildland is founded on major use and degree of modification of the land involved. In general, residential, industrial, commercial, agricultural, and service lands and lands within the boundaries of urban communities are the tame or cultivated lands; while lands in forest cover and other unimproved rural lands represent the wildlands. Land which has been domesticated does not reverse itself readily to a wildland state. Wildland, on the other hand, tends to be uncommitted land capable of making the transition to some more intensive use where physical and economic conditions permit. Of the tame land uses, agriculture is the one which is most likely to lapse and to allow a reversion to the wild state to occur.

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[1] H. R. Wooten, Major Uses of Land in the United States, U. S. Department of Agriculture Technical Bulletin 1082 (Washington, U. S. Government Printing Office, 1953).

Forest Land Ownership

More than half of Michigan's 36.5 million acres of land area may be regarded as wildland under the above definition. In 1950, there were 19 million acres of forest lands and 2.7 million acres of other wildlands in the state. Twenty percent of the forest lands were in farms. More than half the area in farm woodlands was pastured by livestock. Forty-four percent of the forest lands were in private non-farm holdings. The remaining 36 percent of forest land was in some form of public ownership.[1]

Private Forest Land

There are 15.3 million acres of non-farm forest lands in the state of Michigan - 8.4 million acres of private land and 6.9 million acres of public. In 1950, about two-fifths of the privately owned non-farm forest lands were contained in 91 holdings over 5,000 acres in size.[2] The remainder was contained in a very much larger number of smaller ownerships, averaging 48 acres in size (if the farm woodlot holdings are also reckoned in). Public ownership of forest lands involves the State, the Federal Government, and county and municipal units. In 1950, the State was the largest owner in the public group, with title to 4.3 million acres. Federal ownership was exercised in over 2.5 million acres of forest lands, while local government units had 80,000 acres.

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[1]R. N. Cunningham, Forest Resources of the Lake States Region, Forest Resource Report No. 1, U. S. Department of Agriculture (Washington, U. S. Government Printing Office, 1950).

[2]Michigan Department of Conservation, Forestry Division, "Michigan Forest Facts," Sept. 15, 1953.

A knowledge of the reasons for holding forest land and of the objectives of forest land owners in the state should yield some insight into the workings of the Michigan wildland economy. Among the larger private owners, it is known that the forest industries represent an important group of owners. These industrial owners are interested in raw materials for manufacturing in the form of pulpwood, sawlogs, and veneer bolts. They seek security in forest land and growing stock capable of producing a supply of needed raw materials on into the future. Private concerns in such other industries as mining, railroading, power development, and agricultural development represent a significant class of private owners. Another important group of owners may be grouped under the heading of speculation. Holding land for a rise in price is a hope which the great depression of the cutover country from the 1920's on has dimmed but not altogether extinguished. Speculative owners anticipate a rise in land values because of oil discoveries, or the ripening of the land into recreational or other high value use. Ownership for the sake of the direct enjoyment of land represents a final important objective of ownership which may be mentioned. In this group may be included the hunting clubs, private estates, and deer cabin holdings. Related to such direct consumption objectives in land ownership would be private game farms, privately operated childrens' camps, and other uses providing a service to the public but operated for profit.

Some light on purposes of ownership is shed by Sturgeon's study of 20,000 acres of land sold to private owners by the State in Cheboygan County during the period 1935-1947. Among the major uses

to which this land was being put, he found that 26 percent was being used for pasture, 19 percent for timber growing and harvesting, 15 percent for speculation, 11 percent for hunting, and 9 percent for farm woodlots.[1]

Public Forest Land

The objectives of public ownership of forest land in Michigan cover a variety of purposes, including the function of residual ownership of all lands for which there is no private use or demand. Public ownership has for its objectives the supply of a continuing flow of materials and services from the wildland environment; the distribution of these materials and services in such a way that they are as widely available among the people as possible; and the regulation of land use to promote wise economic development and maximize permanence and economy in the provision of local government services, such as roads and schools. Prominent among the services of wildlands are the recreational services of such lands.

Public ownership of forest lands is undertaken and maintained to secure a level of production, a distribution of the product among the people, and a retention of the productive power over time which corresponds more closely with public wishes than it is judged would result without such public ownership. An air of permanence is given to public land ownership by a process of dedicating such lands to specified uses and incorporating them formally within the boundaries

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[1]Edward E. Sturgeon, "Trends in Land Use and Ownership in Cheboygan County, Michigan as Affected by Socio-Economic Development and the Land Disposal Policy of the Michigan Department of Conservation, with Emphasis on Lands Sold to Private Owners by the State of Michigan" (unpublished Ph.D. dissertation, Department of Forestry, University of Michigan, 1954).

of land management units. Each state or national forest, park or game area is placed under custody and administered under established policies. The state lands administered by the Department of Conservation have nearly all been dedicated for explicit conservation purposes. Exceptions are made only in the cases of lands outside the boundaries of state conservation areas. Over 90 percent of the Conservation Department's dedicated lands are in state forests. The remaining lands are divided among state parks, park sites and historic sites, state recreation areas, state game areas, public fishing sites, and the like. Most federal ownership is concentrated in the National Forests, with a small representation of Indian lands, National Parks, and miscellaneous other classifications.

Dedication of lands is intended to express permanence of use. It is well to inquire how definitely committed to particular uses particular units and shares of public lands really are. The great bulk of the public forest lands are managed on what has come to be known as a multiple-use basis. By and large, these lands are operated on the principle that the same piece of land may be made to yield a concurrent harvest of timber products, water, and recreational habitat. Although the emphasis in management may vary from place to place within the national and state forests, these forests are commonly open to timber cutting, open to picnicking, sightseeing and camping, and open to hunting, fishing, and trapping.

Where exceptions have been made to the policy of multiple-use of public forest lands, such exceptions have been made in favor of the dominance of recreation as a primary and exclusive use. Such

exceptions are most marked in the case of park and preserve lands, both state and federal, where all the uses which do violence to land and the life it supports are excluded, timber harvesting and hunting alike. The ultimate example in restricting development is found in the wilderness area ideal, which rules out even the provision of roads in the interest of preserving a bit of nature in an unspoiled form. Cunningham's estimates of 170,000 acres of reserved forest in federal ownership and 203,000 acres in state ownership gives a fairly good idea of the amount of land reserved from timber cutting. The federal share would consist largely in the 134,000 acres of forest land on Isle Royale, in Lake Superior, which has been constituted as a National Park. There were 98,000 acres in state parks, park sites, and historic sites as of June 30, 1954. There is also privately owned land which is reserved from timber cutting, 127,000 acres of it in 1950. Added to the public reserves, this makes 500,000 acres of reserved forest land--not a large portion of the total available. One other exclusion which may be mentioned is closure of private lands to public hunting. Barrett estimated in 1955 that there were over 1,000,000 acres in the northern part of the Lower Peninsula posted against public hunting of a total of 7,000,000 acres of wildland in all ownerships in the same part of the state.[1]

As residual owner of land "which nobody wanted," of land whose timber was "too poor to steal when the stealing was good," it is

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[1] Paul M. Barrett, "Number 9 Wire - Symbol of a Trend," Michigan Conservation, XXIV (Jan.-Feb., 1955), 19, 20.

understandable that the public portion of the wildland of Michigan has less value relatively than its acreage would suggest.[1] In a recent year, only 15 percent of the total cubic foot volume cut in the state came from public lands, and just 5 percent of the cut of sawtimber came from public lands. In 1950, the public agencies had 10 percent of the board foot volume and one-third of the pulpwood volume on land under their control.[2] There is a reasonable presumption, also, that the best of the hunting lands of the state are under private ownership and control. The "club country" of the northeastern part of the Lower Peninsula corresponds closely with the best deer country to be found in the state, both in terms of location and quality. The high value lands which the state owns have been acquired for recreational purposes and largely devoted to such purposes. Over 44,000 acres of land in state recreational areas were acquired by purchase between 1944 and 1954 at an average cost of $84 per acre. In the Pontiac Lake Area, the average cost of purchased land during this period was $167 per acre.

In 1954, the Department of Conservation administered 4.2 million acres of land. Seventy-nine percent of these lands, 3.3 million acres in all, had been acquired through the process of tax reversion. These lands were tax delinquent for three years and not

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[1]The quotations are respectively from Harold Titus, The Land Nobody Wanted: the Story of Michigan's Public Domain, Michigan State College, Agricultural Experiment Station (East Lansing, 1945); and P.S.Lovejoy, "The Worst-First Theory," Journal of Forestry, Vol. 24 (1926), 351-57.

[2]R. N. Cunningham, Forest Resources of the Lake States, p. 39.

reclaimed by their owners within a year following their sale. Less than one million acres, therefore, are in the possession of the state through original land grant, purchase, or gift.[1] There are three sources of funds for the purchase of wildlands by the state for recreational purposes. One of these is by direct appropriation by the legislature for specific recreational purposes. The other two have to do with the use of earmarked portions of sportsmans' license fees for land purchase. Forty cents of each fishing license fee is set aside for the purchase of lake and stream frontage for public fishing access. Federal funds are available for approved land purchase programs for fishing access and for game areas, projects, and public hunting grounds to the extent of 75 percent of the cost of the land acquired. The federal share of these land purchases is derived from the federal excise tax on fishing equipment (Dingell-Johnson Fund) and from the federal excise tax on firearms and ammunition (Pittman-Robertson Fund).

Forest Goods and Services

In today's world, the significant products of Michigan wildlands are timber, water, and recreational habitat. Such lands are referred to as wildlands with a steadily decreasing accuracy of terminology. It is more and more the practice to manage wildlands for harvests of products which are better than nature unaided would bring forth in the same period of time. Forest trees have been set out in plantations for timber production since the early 1900's, first by public agencies only, more recently by private timberland owners

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[1] Michigan Department of Conservation, Seventeenth Biennial Report, 1953-54.

as well. Plantations and wild forests alike have been thinned and weeded to improve the composition and quality of the future forest. Logging operations have been conducted with a view to the regeneration of the forest. A new timber crop has been indirectly encouraged through scattering of cone-bearing brush and scarification of the soil following logging with heavy cutting discs. Nature's abhorrence of vacancies in the forest canopy has been frustrated by fire and herbicides, all in the interest of maintaining the dancing-grounds of sharp-tailed grouse, a bird of very exacting territorial requirements in the mating season. The wildland environment has been manipulated in an effort to make a home for a larger herd of deer providing larger supplies of palatable brush and browse of the kind which deer are wont to choose when they are afforded a reasonable latitude of choice.

Water

Water, that most vital of the resources, is produced by wildland as it is by tame. Efforts to produce more of it are sometimes in competition with other objects of wildland use. Despite impressive evidence of the growing demands of the economy for water and yet more water, and of serious local shortages in certain Michigan communities, there does not appear to be a large or concerted effort in the wildland sector consciously to manage for water. The one interesting exception to this is found in the case of watershed management to improve trout fishing, as in the Rifle River and other similar developments. The belief tends to be that what is good for the other forest objectives is good also for water.

There is a certain indestructability about water, quantitatively at least, which seems to render it dependable into the future. This permanence seems assured under the semi-humid conditions of the Michigan climate with level topography and an absence of dependence on above-ground storage reservoirs. The case of the groundwater storage reservoirs may be a different one of more serious and immediate concern.

There is less reason for ease of mind in connection with timber supplies and wildland habitat values. Although these are flow rather than fund resources and their supply is not fixed and therefore exhaustible, still they exist in a precarious natural balance which is capable of being upset to the point where they can not readily be restored to anything like their former levels of productivity and serviceability. Herein lies part of the reason for the dedication of a sizable portion of Michigan wildlands to stated uses under conservative management.

Timber Products

The major timber products which come from Michigan forest lands are sawlogs, fuelwood, fence posts, and pulpwood. Of less importance in volume and value are such secondary products as mine timbers, chemical wood, and excelsior bolts. The value of all these raw timber products as they came from the forest in the year 1948 was 65.7 million dollars.[1] In that same year, 85 percent of the total volume of timber cut came from privately owned lands and 95 percent of all the sawtimber

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[1]Lee M. James, Michigan Agricultural Experiment Station Quarterly Bulletin, Vol. 34, No. 3, 280.

cut came from private lands.[1] Farmers cut most of the annual harvest of fuelwood and posts from their own land. However, farmers account for but a small proportion of the cut of such commercial products as sawlogs and pulpwood, apparently about 8 percent for these two products in the last census year.[2] Most of Michigan's output of primary forest products is used within the state in raw form or undergoes further manufacture in wood-processing plants located in Michigan. Two important exceptions to this rule are pulpwood and veneer logs and bolts. Net exports of these two products in raw form amount to about 40 percent of the state's production of pulpwood and about an equal proportion of the state's production of veneer logs and bolts.[3] James estimated that in 1948 the work of harvesting primary forest products in Michigan and hauling them to the point of rail shipment or processing provided the equivalent of 22,400 man-years of employment.

Important forest industries in pulp and paper and in furniture and wood specialties are located in Michigan. These industries owe their presence in the state to forest resources, past and present. In 1952, Michigan had nearly 1,500 sawmills including the small ones, 11 pulp mills, and an estimated 120 other plants such as veneer, shingle, and excelsior mills using raw forest products. There were 550 plants

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[1]R. N. Cunningham, Forest Resources of the Lake States Region (Forest Resource Report No. 1; Washington, D. C.: Government Printing Office, 1950), p. 39.

[2]U. S. Bureau of the Census, U. S. Census of Agriculture: 1950 (Washington, D. C.: Government Printing Office, 1952), VII, 740.

[3]Arthur G. Horn, "Commodity Drain from Forests of the Lake States" (Miscellaneous Report No. 18, U. S. Department of Agriculture, Forest Service, Lake States Forest Experiment Station, St. Paul, 1950), pp. 19-20.

which processed not raw forest products in the round but instead the products of the primary wood-using plants, such as lumber, veneer, and the like. Eighty percent of the lumber and pulpwood harvested in the state came from the Upper Peninsula, but 85 percent of the wood product plants, exclusive of sawmills, were located in the Lower Peninsula.[1]

Recreational Use

Statistics on recreational use of forest lands in Michigan are most plentiful in connection with such well-organized and regulated activities as hunting, fishing, and camping. In particular, recreational use records are available for that portion of the forest lands which are in public ownership. Sales of licenses afford a good estimate of the number of people who participate in hunting and fishing. Statistics on the kill of game animals and birds and creel censuses on the take of fish afford a record of the success of sportsmen. In 1954, over 700,000 hunting licenses, over 400,000 deer licenses, and nearly 900,000 resident fishing licenses were sold in Michigan. The State Parks had over 15,000,000 visitors. The population of the state was trending upwards, but at not nearly so fast a rate as the growth in sales of deer licenses and the rate of increase in park attendance.[2]

It was estimated that in 1950 and again in 1951 there were 7,000,000 resident and non-resident "visitors" in Michigan, including both weekenders and vacationers. The total expenditures of these visitors

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[1]John Hanson, "Wood-using Industries of the Lower Peninsula." Michigan Conservation XX (Feb., 1951), 13.

[2]Charles P. Loomis, "Wildlife and Recreation, the Past and the Future." Michigan Conservation XXIV (May-June, 1955), p. 6.

on the basis of an average daily expenditure of $7.50 per motorist and an average stay of 11 days was estimated to be 560 million dollars.[1] It would be a difficult matter to allocate these visitors as between forest recreationists and other recreationists. The Ebasco group estimated that the tourist business amounted to 50 million dollars in the Upper Peninsula in 1950, which would be about 10 percent of the total.[2] Michigan was the fifth most frequently mentioned state as a vacation destination in the Curtis Publishing Company survey for the year 1951. One person in 20 in the nationwide sample mentioned Michigan as a vacation destination.[3]

The valued recreational resources arising from northern Michigan forests and waters are enjoyed mainly by Michigan people. The studies described in an earlier chapter suggest that tourists aside the local people and down-state Michiganders have formed the bulk of the recreationists. Thus, Pearson found in a sample of over 5,000 cottage-renters, out-of-county owners, and sportsmen in Ogemaw County that 70 percent were "from an area extending north towards Ogemaw County from Detroit, Mt. Clemens, and Ann Arbor." Five percent were from Monroe County and Ohio. Deasy's findings on the origin of recreationists were similar for Luce County in the Upper Peninsula in 1944. Of 249 summer vacationists who used cottages and resorts, 30 percent

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[1]American Automobile Association, "Americans on the Highway. A Report on Habits and Patterns in Vacation Travel." 1953.

[2]Ebasco Services Incorporated, Michigan's Upper Peninsula: An Engineering Study, (Michigan Department of Economic Development, 1953) p. 11.

[3]Curtis Publishing Company, "The Vacation Travel Market of the United States." Nationwide Survey No. 3, 1952, p. 54.

were residents of Luce County and 70 percent were non-residents of the county. Fifty visitors came from elsewhere on the Upper Peninsula, while 4 were from Ohio and Illinois. By comparison, 98 were from southeastern Michigan and 28 from southwestern Michigan.[1] Such figures emphasize the naturally prominent part which local people play in recreational use in the north country, and also the dominance of Michigan residents in overall recreational use. The local people, being on the spot, can enjoy more and better recreation for less money. They are there to take advantage of every turn of the season, whether it be bird shooting, Indian summer scenery, or winter sports.

Economic Underdevelopment

The northern part of Michigan, consisting of the Upper Peninsula and that part of the Lower Peninsula lying north of the Muskegon-Bay City line, constitutes a close-to-home illustration of the phenomenon of economic underdevelopment. As consumers, people like to live where living is cheap and agreeable, but as producers they are impelled in the direction of the superior economic opportunities. Forest industries have provided a means of support to many local communities; the tourist and recreation businesses have provided some added livelihoods and some seasonal supplementary employment. But, the fact is that northern Michigan has been falling behind the rest of the state in its rate of economic growth since early in the present century. Between 1940 and 1950, the population of the state grew by over 20 percent. During that same 10-year period the population of the Upper Peninsula fell by

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[1] George F. Deasy, "The Tourist Industry in a 'North Woods' County," Economic Geography, Vol. 25 (July, 1949), 240-59.

6 percent. The population structure of the Upper Peninsula counties differs markedly from that of the rest of the state. The percent of the population over 65 is higher than that of the state as a whole, showing the effect of the out-migration of those in the productive years capable of responding to better opportunities elsewhere. The proportion of families with incomes under $2,000 in 1950 was strikingly greater than elsewhere in the state. Farm level-of-living indexes were lower and the number of days worked off the farm by farm operators was relatively large.[1] Thus, there is not one Michigan, but two. Even the benefits of the native northern resources of timber and minerals are largely channeled off to the better located southern portions of the state.

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[1]U. S. Bureau of the Census, County and City Data Book, (Washington: U. S. Government Printing Office, 1952).

V. NATIONAL INCOME ACCOUNTING

In tracing the income flow from specific uses of land, it is advisable to consider the techniques which are in general use for the measurement of income. Surely, if these techniques can be made to serve, the resulting measurement scheme will have the widest possible comparability with other forms of economic activity. Moreover, a systematic and tested system for getting full coverage without duplication will have been utilized. Therefore, it is in order to turn to the concept of income and the principles of national income accounting and see what help they may give in forwarding this income measurement endeavor.

Concepts in Income and Wealth

Income and Wealth in General

The wealth of a community is dependent on the stock of valuable things at the disposal of its members at a particular point in time. The wealth of a society is the sum of the material objects owned by human beings. These material objects may consist of land with its associated improvements, of commodities capable of being moved from one place to another, and in the broad sense of human beings themselves with their inherent and culturally acquired powers.[1]

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[1] Irving Fisher, The Nature of Capital and Income (New York: MacMillan, 1906). Human beings are material objects owned by themselves.

Income is a flow of additions to the stock of wealth occurring over a given period of time, such as a year. The creation of this flow of value or commodity is termed production.[1] Reductions in the amount of stock occurring over a unit of time may be termed outgo or consumption. The difference between production and consumption over the same time period expresses the net accumulation or investment which has taken place during that period. Production and consumption are to be distinguished from money receipts and expenditures. The latter merely represent changes in the form of assets by an owner. Not all receipts correspond with production, nor do all expenditures represent consumption.[2]

The Concept of National Income

The national income is the current year's production over the whole of the national economy. It may be measured from two differing points of view, namely, as the year's flow of finished or partly finished products; or alternatively, as the sum of payments to the factors of production (including government) which contribute to making that output possible. The two measurements are of the same process from two differing points of view. Productive activity brings into being units of new goods and services which are evaluated in the market place at the price that buyers are willing to pay. The value of what is produced is divided among those who have lent their resources to the productive effort. The division is in accordance with the terms on which they have made these resources available.

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[1]Services as well as goods are included in this flow of commodity.

[2]The discussion here follows Kenneth E. Boulding, Economic Analysis (2d Ed. rev., New York: Harper and Brothers, 1948), p. 286.

Inclusiveness of Income

A number of problems arise as to what items properly belong within the scope of the national income and product accounts. Income in the sense of objects of value as defined above may be produced not only by the business sector of the economy, but also by government agencies and enterprises and also by the uncompensated efforts of individuals working alone or associated in groups. It has been found advisable to limit the national income measurement almost entirely to items which form part of the market economy.

The activities of business lend themselves very readily to an income accounting of the kind described. The economic contribution of government includes the purchase of products of the private economy which have been accounted for there, and may therefore be measured, net of such purchases, in terms of the salaries and wages paid to the employees of the various units of government. The third great form of social organization contributing to economic welfare along with business and government is the family.

When a man paints his house, he is as surely adding to the economic product of the Nation as when he hires a painter to do the job. A group of farmers who stage a bee to help raise a neighbor's barn roof are contributing to the nation's output of wealth, although they receive no payment for the work which they do.[1] The largest item in the family economy is undoubtedly the unpaid contribution of housewives and other family members to the everyday operation of the

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[1]It is this absence of compensation which results in the exclusion of such self-help activities from the national income and product.

nation's households. Yet, the convention which has been adopted in national-income accounting excludes from consideration these contributions of personal services in the family. Also excluded in the main are the items produced by the family and consumed within the family. The exceptions which are regularly made have to do with sizable items which have well-marked counterparts in the market economy. Thus, the services of owner-occupied dwellings are recognized as a form of income to their owner. The use by farm families of farm-raised food and fuel is also evaluated at market price and recognized as income in kind or imputed income. But, not so with personal services within the family circle. A man who marries his housekeeper, it has been pointed out, thereby diminishes the national product.

Related Measures of Production

The value of a year's production is the value of the year's output of ultimate products not themselves used up in further production.

The national income may be regarded as both a flow of objects of wealth and as a flow of income payments to factors of production. Looked at as a flow of articles of wealth, it is clear that a distinction may be made between items which are used up in further production and items which are in their final form of usefulness as articles of consumption, or as items of capital plant and equipment for further production.

Input-Output Analysis

For certain purposes it is not essential that a distinction be made between final product and intermediate products. The input-output or interindustry studies first carried out by Leontief at Harvard and continued for a time after World War II by the United States Department of Labor contain a vast wealth of information on the allocation of the products of particular industries and on the sources of the inputs used in making these products.[1] What is output for one industry frequently becomes input for another industry. The output of the tire industry, for example, is input for the automobile industry. The input-output analysis throws a great deal of light on industrial interrelations. It is not serviceable in measuring national output because of the large measure of double-counting of product which it involves. The total output for the 42 industry classifications for the year 1939 was 270 billion dollars.[2] The U. S. Department of Commerce figure for the gross national product for that same year was 91 billion dollars.[3]

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[1] Input-output data for the years 1919, 1929, and 1939 are summarized in the tables in the pocket in Wassily W. Leontief, The Structure of the American Economy, 1919-1939; An Empirical Application of Equilibrium Analysis. (2d. ed. enlarged; New York: Oxford University Press, 1951); and for the year 1947 in W. Duane Evans and Marvin Hoffenberg, "The Interindustry Relations Study for 1947," The Review of Economics and Statistics, XXXIV (May, 1952), 97-142.

[2] Leontief, Table 24 in pocket.

[3] National Income. 1954 Edition. Office of Business Economics, U. S. Department of Commerce (Washington: U. S. Government Printing Office, 1954), p. 162.

Value Added by Manufacture

In the Census of Manufactures carried out periodically by the U. S. Bureau of the Census, the output of manufacturing industry is measured in terms of the "value added by manufacture." Double-counting of product is avoided by calculating the value net of the cost of purchased materials. "Value added by manufacture is calculated by subtracting the cost of materials, supplies, and containers, fuel, purchased electric energy, and contract work from the total value of shipments."[1] A comprehensive system of income accounts must go beyond manufacturing and take in other productive services, such as transportation and trade. It is therefore necessary to go beyond the value added approach to measure national income in all its phases.

National Income Measurement by the Department of Commerce

The measurement of income on a systematic basis for modern nations with industrialized economies has been greatly extended and conventionalized in recent years. In the United States the efforts of such privately supported research foundations as the National Bureau of Economic Research and the statistical investigations of the Office of Business Economics in the Department of Commerce have led to the elaboration of logical and standardized systems of measuring the annual national product. In Great Britain and other nations, a similar refinement of the measurement of national income aggregates has been accomplished. The growth in scope and detail of the periodic government censuses relating to manufacturing, trade and agriculture,

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[1] U. S. Bureau of the Census, Census of Manufactures: 1947, Vol. I, p. 20.

and the growth in detailed knowledge of economic indicators which has been a by-product of the growing activities of government in taxation and social security have all facilitated the comprehensiveness and accuracy of the measurement of national income.

Structure of the Accounts

Final Product

The approach to measuring the national product free of duplication adopted in the U. S. Department of Commerce national income work is based on measuring product at its ultimate point in the economic process. Current production is absorbed by households (in the form of personal consumption), by business, by government, and by foreign customers. One place, therefore, to get an unduplicated measurement is at these gates where production is absorbed. Households take the bulk of current production in the form of personal consumption. The part of final production which is taken by business goes into additions to inventory or into new plant and equipment.[1] Government absorbs a share of current production in furtherance of its far-flung activities. The only remaining destination for current production is to customers in other countries and sources of investment abroad.

Product of Government

The product of government is measured in terms of the wages and salaries paid by government. The justification for excluding items bought by government is that they are reckoned in as a part of the

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[1] Business also has a few consumption-type expenditures, if one considers the furnishings of executive offices, company cars of a ceremonial nature, and the like.

product of the private business which produced them. The services of government are somewhat arbitrarily regarded as instances of final product. It can be argued that a government built and operated school or road is an intermediate step in production. But, the practical way of handling the government account is to regard such facilities as final product.

Taxes, subsidies, and the interest on government debt all present problems in being brought under the framework of national income accounting. To the extent that government makes a contribution to current production, the payment it receives for such services, namely, taxes, needs to be included in the national product. Payments by government which are not in return for a current contribution to production are excluded from national income. Pensions and social insurance payments by government fall within this category. Similarly, interest payments on the national debt are excluded on the grounds that they largely represent paying for the costs of past wars.

Industrial Classification

The orderly measurement of income requires that income and product be summarized by industries and industry groups. The possibilities for industrial classification are numerous. Establishments and companies may be grouped according to product or major raw material used, or according to the type of process employed. Service-type industries, such as transportation, communication, finance, and real estate cut across the regular industrial grouping. To bring about a measure of uniformity, a common scheme of industrial classification

is employed by United States government statistical agencies.[1] Users of government statistics must therefore adapt themselves to this system of classification, whether it seems most desirable for their own purposes or not.

National Income and Related Measures

In producing a year's output of product, some of the equipment and productive plant of a nation wears out. The productive output of the nation without regard to depreciation is measured by the Department of Commerce "gross national product" series. The "national income" as calculated by the government involves the deduction from the gross national product of the amount of capital consumption incidental to the year's production; and also of indirect taxes, such as sales taxes, customs duties, and business property taxes.

But, these two measures of national income and product do not by any means exhaust the list of standard measures which may be appropriate and useful for specific purposes. National income measures the payments to the factors of production, including government.[2] "Personal income" differs from national income by the deduction of factor payments not received by persons, such as social insurance contributions, corporation profits taxes, and undistributed profits; and by the addition of certain transfer payments which do not form part of national income. These included items which do not represent a payment for a contribution to current production consist of such items as pensions, interest on the national debt, and the charitable contributions of business.

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[1]This classification is contained in the Standard Industrial Classification Code of the Office of Statistical Standards of the U. S. Bureau of the Budget, 1945.

[2]"Direct taxes" such as personal and corporate income taxes are included in national income.

The national income measure which measures what individuals have to spend after paying their income taxes is "disposable personal income."

The origin of the national income by states was formerly measured by the series "state income payments." Income payments to individuals were distributed among the states largely on a where-received basis and have included such items as wages and salaries; income of proprietors, property income in such forms as dividends, interest and net rents and royalties; and various forms of government payments to individuals.[1] The state income payment series has now been replaced by the measure "state personal income." By making a few relatively minor changes, it has thus been possible to bring the measurement of income by states into more direct relationship to the corresponding personal income measure for the Nation as a whole.[2]

Two-Sided Accounts

The principles of income measuring which have been under discussion here can best be brought into an orderly scheme by presenting them in terms of income and product accounts. In this effort, the two-sided accounting procedure that characterizes the Department of Commerce national income accounts will be followed. The product or right-hand side of the accounts lists the sources of the payments, namely, personal consumption expenditures, private domestic investment, purchases by government, and sales to foreign countries. Of

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[1]Charles F. Schwartz and R. E. Graham Jr. "State Income Payments in 1949: Technical Notes." Survey of Current Business, Vol. 30 (August, 1950), 22-24.

[2]Charles F. Schwartz and R. E. Graham, Jr. "Personal Income by States, 1929-54," Survey of Current Business, Vol. 35 (Sept. 1955), 12-22, 32.

these items, by far the largest is personal consumption expenditures, which currently accounts for some 75 percent of all the sources of payments which enter into the national income. The income or left-hand side of the accounts shows the allocation of these payments among the factors of production according to the type of income received, namely, compensation of employees, income of unincorporated enterprises, corporate profits, net interest and rental income, and an adjustment for the change in value of inventories. These two sides of the accounts constitute two views of the same set of transactions viewed from different sides. To the extent that their calculation can be carried out independently, an overall strengthening of confidence in the reliability of the totals arrived at is gained.

Sources of Payments

Personal Consumption Expenditures

The end of production in our society is the satisfaction of the wants of individuals. Most of each year's production is therefore for the consumption of persons. Personal expenditures for consumption may be for commodities or for services. For the commodity portion of consumption, the problem is one of estimating the retail valuation of such items as the wood turnings, the wooden furniture, the rods and guns, the gas, oil and tires.

There are three main ways in which the valuation of commodities may be accomplished.[1] The first of these uses the periodic

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[1] National Income, 1954. pp. 103-17.

Censuses of Retail Trade as a starting point, adjusting the sales of retail establishments downwards for sales not made to individuals, and upwards for purchases individuals make which are not made in retail establishments. A difficulty here is the problem of sorting out the components of sales of particular items made by stores in the fairly broad Census classifications of retail establishments. What is known, for example, of the breakdown of the sales of such a group as "lumber, building, and hardware?" The second method, which is the one chiefly employed, is the "commodity flow" method. In this method commodity production is traced forward from the producer. The portion which is taken by individual consumers, whether from the manufacturer directly, at wholesale, or at retail, is identified. The commodity flow method also serves to identify the part of the production of commodities which is purchased by business as producers' durable equipment. A third method of estimating personal consumption expenditures is the "retail valuation" method, in which estimated quantities purchased are multiplied by an estimated average retail price. This method, which has great simplicity to recommend it, is used on the national level to estimate such items as passenger cars and sales of gas and oil.

Personal consumption expenditures for services as opposed to commodities cover such items as cottage rentals, hire of hunting guides, transportation fares, hunting club dues, and the like. Estimates of expenditures for services are taken from a diversity of sources, public and private. Among the most important are the periodic Censuses of Population and Housing, and of Business.

Gross Private Domestic Investment

Besides the production of goods and services for consumption, the annual production of durable capital items and the net change in inventories must be reckoned in the total of the year's production. We must count as income the portion of production which is destined to yield a continuing flow of goods and services and partakes of the character of forms of wealth with a capital value. Private investment refers to new construction, whether of individuals or businesses, and to producers' durable equipment. Here, again, a variety of sources, such as trade association reports and records of building permits are relied on to give the required estimates. Timber access roads on privately owned lands, farm ponds, and deer hunting cabins may all be regarded as examples of gross private domestic investment.

Government Purchases of Goods and Services

A further source of payments is the purchase of goods and services by government. Unlike many of the purchases of business, the purchases of government are not resold and therefore receive no duplication elsewhere on the product side of the ledger. Government budgets and the annual reports of government departments seem the most appropriate place to find the amounts of these items.

Personal Consumption In Kind

Well defined items of consumption, which are not received in the form of money but directly as goods or services, also form part of national income and need expression on the product side. This is accomplished by regarding the food and lodging furnished to employees without charge as a sale of these items to the employees at their cost

to the employer. Similarly, the owner of a summer cottage who occupies it himself is considered to be renting it from himself. Farm-cut fuel used on the farm is counted as though it were a sale by the farmer to himself at the price the wood would bring if put on the market.[1]

Distribution of Income

The sources of gross product have now been listed. The disposition of this product among the recipient groups and the varying forms in which these shares are allotted is now to be developed to form the other or left-hand side of the accounts. Each of the components of the income side will be described and briefly illustrated as was done in the case of the items making up the sources side.

Compensation of Employees

Compensation of employees for the productive services of labor and management accounts for the largest share of income receipts, totaling two-thirds of the national income.[2] Most of this compensation is received in the form of salaries and wages. "Other labor income" is that smaller part of compensation of employees which consists of such items as employer contributions for social insurance and private pension plans, compensation for injuries, and directors' fees. The chief source for data on payrolls are the records kept in connection with the Social Security Act. These must be supplemented by other records for employees of government, households, and industries not covered by social security. An alternative to the use of such

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[1]The treatment of income received in kind is discussed more fully in National Income: 1954, p. 46.

[2]Ibid., p. 160, Table I.

publications as County Business Patterns, which is issued quarterly in conjunction with the administration of the Old Age and Survivors Insurance plan, would be the use of the periodic Censuses of Business and Manufacturing.

Income of Unincorporated Enterprises

Proprietors of unincorporated businesses receive their earnings in a form which differs both from the wages and salaries of employees and from the profits of corporations. Unincorporated enterprises have an importance in the trade and service industries and also in logging and milling. Finding the income of these enterprises is one of the more difficult and less charted aspects of the work. In general, the approach of applying a profit ratio to the gross receipts of such enterprises is as good a method as can be found. The returns for agricultural proprietors are best obtained from the work of the Agricultural Marketing Service of the Department of Agriculture.

Rental Income of Persons

This item, as a distributive share of the national income, refers to the net income of persons (including owner-occupiers of dwellings) for the rental of property. It does not include the net income arising from rentals paid to landlords who are not persons. Its estimation is a complex procedure resting on the separate determination of rentals for farm, nonfarm, and business and industrial properties. Income tax returns are one of the primary sources, but their utilization presents some considerable difficulties.

Corporate Profits

Also arising mainly out of records of the Internal Revenue Service are the estimates of corporate profits before tax. Differences in concept and purpose result in a modification of profits as given by tax returns. For example, capital gains are eliminated from profits (since they do not relate to current production) and allowances for depletion are added back to profits, since depletion is not regarded as a form of capital consumption for the sake of the national income and product accounts.[1] Related to corporate profits (and also to the income of unincorporated enterprises) is the item "inventory valuation adjustment," which refers to the adjustment in changes in inventories reported by business to bring the treatment of the valuation of inventories to a common basis. This adjustment is not a large item in the whole system of accounts.

Net Interest

Net interest refers to the portion of interest paid to individuals exclusive of that paid by government (which is not held to relate to current production). Monetary interest received by business and foreigners is the item deducted from total interest payments to secure net payments of interest to individuals. Main sources for interest payments are Internal Revenue and Department of Agriculture records.

Nonfactor Payments

The gross value of a year's production includes an element which is not received by factors of production for productive services.

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[1] National Income, 1954, p. 92.

It also includes the capital used up in that year's production. In order to pass from gross national product to national income, it is therefore necessary to make allowance for these two classes of items. The principal items which must be deducted from the value of the gross product are capital consumption allowances, indirect business tax and non-tax liability, and business transfer payments. National income was 17 percent less than gross national product in 1954.[1]

Capital consumption allowances consist of depreciation, capital outlays which are charged to current expense, and accidental damage to fixed capital. By far the greater proportion of these allowances takes the form of depreciation, as the term is commonly understood.

Indirect business taxes are defined as all taxes that are chargeable as business expenses. They comprise mainly excise and business property taxes, including the tax on owner-occupied housing property. Business transfer payments are those payments made by business which are not in return for a corresponding productive service. The chief sources of such business transfer payments are business gifts to non-profit institutions and consumer bad debts.

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[1] Survey of Current Business, Vol. 35 (July, 1955), p. 6.

VI. BUILDING A FRAMEWORK FOR MEASUREMENT

The foregoing chapters are preliminary to the real object of this study, which is to find a means of measuring and comparing the economic importance in Michigan of home-grown timber and home-provided recreational opportunities in the forest. The concept towards which the discussion of economic importance has been tending must now be formalized and given sharper outlines. This done, the translation of this concept into an operational procedure will then be described. For timber products and for recreation, the range of quantities to be measured will be indicated, the sources of measurement data stated, and the means of handling the allocation of items as between forest land use and the rest of life suggested.

Measurement Concept

Economic Importance

Economic importance will be measured in terms of additions to stock of goods and services brought about. It will not be maintained or implied that economic importance is identical with importance in general. Rather, it will be held that an objective concept of economic importance measurable in dollars may be derived from income produced, valued in terms of market price. Whether an activity is trivial or vital, the valuation of the market place will be accepted as denoting the economic importance of that activity. To this extent, the concept of economic importance will be more definite and operational but less complete than one which attempted to encompass the rest of life, as well as the world of dollars and cents.

Income is preferable as an index of economic importance to other measures which might be chosen. It is more satisfactory than wealth, which would necessitate the appraisal of everything of value. There is no market for many of the things it would be necessary to evaluate.[1] Those capable of evaluation are often valued in terms of their income-producing power by a process of capitalization. Amount of employment provided might be another possible criterion on which economic importance could be based. But to relate economic importance to quantity of employment afforded would be to restrict the scope of importance unduly. The way to abundance is via the substitution of land and capital for labor. An industry with a low component of labor in relation to other factors of production may easily be the source of more new wealth than one with a higher complement of labor, but lower associated inputs of machinery.

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[1]Thus, in a recent estimate of the market value of forest land in the United States made for a national balance sheet, market value was based on the immediate sale value of all land and timber for timber use, omitting public values in water production, recreation, and wildlife and also the value of improvements and equipment. This estimate of 8 billion dollars for all forest land in the United States in 1946, made by H. R. Josephson, is contained in L. A. Reuss, "Land Utilization Data as Background Information for the National Balance Sheet and Approximations of the Value of Forest Lands," Studies in Income and Wealth, Vol. 12 (New York: National Bureau of Economic Research, 1950), p. 233.

Point of View

The point of view from which economic importance is to be judged is that of the State of Michigan as a whole.[1] Each use of forest lands will be judged by the effect it has on the sum total of goods and services available to the people of Michigan. The benefits of forest resources are widely spread through the entire state and are not just confined to the residents of the more heavily forested districts. The large amount of land in public ownership makes the administration of forest policy a matter of political as well as economic concern to farmers and urban people of southern Michigan, many of whom are dependent on forest raw materials for their employment and on northern woods and waters for their best loved recreational hours.

The State is a logical unit from the standpoint of the condition of statistical data. Certain classes of information are made available for states as a whole which are not compiled for smaller units. Uniform patterns of administration, policy, and record-keeping over a state help to make it a logical and useful unit of aggregation from a practical point of view.

Secondary Economic Effects

The most important practical decision to be made relates to the scope of economic effects to be encompassed by the terms timber production and wildland recreation. Economic effects might be

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[1] The difference between this point of view and that of the recreational studies of Pearson, Hedrick, and Brueckheimer discussed in Chapter III above is to be emphasized. In all of those studies, significance was judged from the point of view of the people resident in the forested counties. The approach chosen here is similar to that of James in his study of income from timber products in Michigan, also described in Chapter III.

limited to the direct returns to land, or broadened out to include a wide range of connected economic events. It is not immediately evident which approach is to be preferred. Only by considering the present purposes of measurement does the right point of view for appraisal suggest itself. It must be recalled that these purposes are reasonableness and comparability, along with the ability to be put into practice.

The competition of land uses in the private portion of the economy is decided in favor of the use which shows the highest return to land. This return to land, net of the payments to the other factors of production, is the economic rent earned by the land. From the standpoint of the individual land owner, this is the return which is of the greatest importance.

From the standpoint of a community, and particularly of so large a unit as a state, the rent approach would lead to a result which would be misleading, both by the smallness of its size and the relative returns it showed for the differing uses of the land. It has already been indicated how hard it is for the private forest land owner to appropriate some of the recreational returns of his land or secure income from them. Moreover, wealth comes from the primary products of the land mainly through their further manufacture and distribution rather than directly from their much smaller value as raw products.

One step beyond measuring the income from direct products of the land would be measurement of what Lamm called "primary money income" at the point where goods and services have passed through

the first processing enterprise.[1] The difficulty with such a plan where timber and recreation are the products being evaluated is that in the case of recreation the first processing enterprise and the ultimate consumer are identical. The ultimate consumer and the first processing enterprise may be widely separated in the case of timber products. Of more general applicability to the present investigation is "secondary money income" following Lammi's terminology once more, "accruing to the factors of production beyond the primary stage, including, for example, the suppliers of materials, transportation firms, processing plants, wholesalers, and retailers."[2] In the case of the forest products which are physical goods the tracing of this secondary money income presents no insurmountable theoretical or practical difficulties. Of more devious origin and composition is the secondary money income which arises incidentally to the pursuit of forest recreation.

The basic consideration here is that the forest recreationist is characteristically a tourist. He is a man on a pleasure trip of less than a year's duration, spending his money in the place he visits without earning it there.[3] By his presence and what he does, he adds to economic product in the place which he visits. Where his activities involve special clothing and equipment, there are also

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[1]This concept is discussed in Chapter II above.

[2]J. O. Lammi. "Primary Money Income from Range Watersheds," p. 10.

[3]The definition is based on F. W. Ogilvie, The Tourist Movement, An Economic Study (London: P. S. King, 1933).

further secondary income effects from his pursuit of recreation. It may be difficult if not impossible to allocate these effects to specific units of recreational use of land, but their existence and economic importance is undeniable.

In view of the foregoing considerations, the economic effects of timber and recreation will be measured at the point where they satisfy final demand. The agents of final demand in the national income framework are individual consumers, businesses, and governments. In the case of products which are exported from Michigan, measurement would apply to the highest form which they reached before leaving the State. The economic effects expressed as new plant and equipment should be counted, if possible, along with the economic effects which take the form of consumable products. Applicable investments by individuals in the form of buildings and improvements should be counted along with investments by business for new construction and machinery.[1] Applicable government expenditures for both goods and services will also be included.

Some measure closely approximating the national income concept will be sought. This type of measure will provide for depreciation and eliminate the effects of excise taxes and other non-factor costs. A national income type of measure is a good one for making general income comparisons among industries. It is a measure which it will be possible to estimate with some readiness from

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[1]Investment expenditures may be omitted for both timber and recreation if it should prove too difficult to gather the needed information. Quantitatively, they are of minor importance compared with consumption expenditures.

published statistical materials, both for the timber phase of the evaluation and for a part of the recreational side of the problem. The alternative choice of valuing in terms of value added by manufacture for timber products and value added by merchandising for recreational products is not made for two reasons. First, it would be too gross a measure of the contribution of each of the two industries. Secondly, the statistical data are not readily available that would allow an estimate of the value added by merchandising to be made.

This, then, is the concept of economic importance for which it is proposed to suggest specific estimating procedures. The problem from this point forward is one of finding or indicating the sources of the data, and suggesting the allocations and adjustments which must be applied to the data. Such a spelling out of the appropriate sources and allocations will constitute a test of the reasonableness and practicability of the concept described above.

Measurement Procedure

Timber

Scope

The economic contribution of timber is the value of a year's output of timber products plus the expenditures of the timber industry for new plant and equipment not charged to current account plus the investment expenditures of government and private owners for timber production which are not currently expensed. Included in the year's

output of timber are the value of fuel, posts, and lumber produced on the farm for home-use and not for sale.[1] The value of timber products in a Michigan context may be reckoned as the sum of three components, namely, the value of raw timber products, value added by manufacture, and value added beyond manufacture within the confines of the Michigan economy.

Sources

The value of raw timber products for the State of Michigan is computed annually by the U. S. Forest Service, Division of Forest Economics, as part of its nationwide statistical compilation services. Estimates are made of the quantity of each of the products turned out during the year and a value estimate computed by applying an average price to the total production.[2] The inclusion of farm produced timber within these totals takes care of that component of raw timber products.

The value of timber manufactures may be taken from the latest Annual Survey of Manufactures, supplemented for more detailed breakdowns by benchmarks taken from the most recent Census of Manufactures. The census offers the quantity "Value added by manufacture," which is the figure desired as a first approximation to the value of product of wood-using industry. Value added by manufacture is given by

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[1] Such a listing is an extension of the item "fuel produced and consumed on farms," of the national income accounts, National Income, 1954, p. 214.

[2] Arthur G. Horn, "Commodity Drain from the Forests of the Lake States," cited above, is an example of the estimates on volumes cut summarized annually by the Forest Service.

state and by industry groups. Also obtainable from the Census of Manufactures for these industry groups is the quantity "expenditures for new plant and equipment," as required for the proposed measurement procedure. The net government investment for timber production would have to be worked out with reference to the statements of receipts and expenditures of the concerned federal and state government agencies and by consultation with the suitable staff members in these agencies. A similar item for the investment expenditures in timber production of private owners could be estimated with the aid of state and federal extension workers and such industry associations as the American Forest Products Industries.

An estimate of the value added beyond manufacture in Michigan must be built up with reference to the various classes of products. A large bulk of the output of Michigan grown timber goes into construction, railroads and maintenance work.[1] Of the part which goes to wood-using industries, some goes into containers and other products which have no value added beyond manufacturing. That part which goes into wood furniture and other personal consumption items is absorbed by a national market. Estimating the Michigan share of that national market, and the part Michigan produced products play in meeting the Michigan share offers a task to test the ingenuity.[2]

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[1] John Hanson, "Wood-using Industries of the Lower Peninsula."

[2] A starting point would be the publications of such industry associations as the Maple Flooring Manufacturers Association, the National Association of Furniture Manufacturers, and other similar organizations listed in the comprehensive book by Jay Judkins, National Associations of the United States (Washington: U. S. Department of Commerce, 1949).

Such industries as the Christmas tree and maple syrup industries may be approached in terms of the marketing studies, which are made periodically to determine the value and sources of production and sales.[1]

Allocations

Certain common sense allocations and deductions are needed in connection with the use and interpretation of statistics from the above-mentioned sources. There is a need to draw a line between the timber products whose processing is tied to locally-grown raw materials and that which is independent largely of Michigan timber. A recent study of Hanson's covering the year 1950 suggests that some timber products are made in Michigan because the market is here, rather than because of the local supplies of timber.[2] Table I, taken from Hanson's report, shows that such an industry as the sash and door industry obtained but one percent of its requirements of 52 million board feet of lumber from Michigan grown wood. The furniture industry drew 22 million board feet from Michigan forests of the 53 million board feet which it consumed in 1950. Six Lower Peninsula pulp and paper mills got 53 percent of their wood requirements from Michigan and the balance from elsewhere.

What seems to be needed is a formula or a judgment basis for deciding which industries are dependent on Michigan materials and which are not. Reference to Table I suggests that a figure of

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[1]See, for example, Lee M. James and Lester E. Bell, Marketing Christmas Trees in Michigan, Special Bulletin 393, Michigan State College Agricultural Experiment Station, East Lansing, June, 1954.

[2]John Hanson, "Wood-using Industries of the Lower Peninsula."

Table 1.--Origins of wood supplies of wood-using industries of the Lower Peninsula, 1950.[1]

Industry	Establishments	Employees	Wood consumption	Source		Michigan wood
				Michigan	Out of state	
	Number	Number	M.b.m.	M.b.m.	M.b.m.	Percent
Furniture and carvings	76	8,239	52,523	22,373	30,150	43
Containers	73	1,273	65,876	29,086	36,790	44
Wood specialties	71	3,123	23,811	9,542	14,269	40
Rustic products	68	547	22,228	21,273	955	96
Custom wood-working	41	195	1,705	666	1,039	40
Sash and door	22	856	51,520	535	50,985	1
Turnings	22	285	3,822	335	465	88
Store equipment	22	1,487	10,980	2,934	8,046	27
Boats	19	1,632	5,695	441	5,254	7
House trailers and ready-cut buildings	19	1,966	40,240	1,680	38,560	4
Games and sporting equipment	12	651	7,882	4,143	3,739	53
Flooring mills	10	201	17,322	14,392	2,930	83
Caskets	9	105	1,669	289	1,380	17
Musical instruments	8	655	5,182	2,051	3,131	40
Radio cabinets	6	1,510	28,529	404	28,125	1
Pulp-paper mills	6	1,920	108,600	57,620	50,980	53
Vehicle racks and bodies	5	65	976	425	551	44
Ladders and scaffolding	4	42	2,101	247	1,854	12
Shingle mills	3	19	187	187	.....	100
Veneers, plywood	3	536	6,030	2,205	3,825	38
Wood machinery	3	206	438	426	12	97
Excelsior	2	177	3,660	3,660	.....	100
Totals	504	25,690	460,976	177,936	283,040	39

[1] Table 1 reproduced from Michigan Conservation, Vol. 20 (Jan.-Feb., 1951).

40 percent or over of Michigan wood used would be sufficient to regard an industry as dependent on Michigan wood and owing its location to the supply of Michigan wood available. The veneer and plywood industry, using 38 percent Michigan grown wood, might also be included because it is near the margin. One would thus be obliged to regard the sash and door, store equipment, boats, house-trailers and ready-cut buildings, caskets, radio cabinets, and ladders and scaffolding industries as owing their location in Michigan to market and processing considerations primarily rather than to the availability of home-grown wood materials.

The 40 percent or over native wood convention is helpful also in dealing with such important wood-using industries as construction, shipping, and general manufacturing. These uses within the state rely heavily on imported wood, well in excess of the 60 percent minimum. There would still be construction and shipping, whether a local supply of materials were available or not. The lumber industry as a whole is a national industry serving a national market, and for many years past it has partaken of this character.

Value of production, built up in layers from raw products through manufacture and beyond manufacture, is a good first approximation to income produced by timber products. The approach suggested represents a sort of modified "commodity flow" approach. In the forest industries it is an easier matter to identify the producers and follow their output forward than it is to work back from the final demanders of the forest products. The correction

that is required to remove the influence of depreciation, indirect taxes, and other non-factor payments may be found by comparing the percentage differences between the Census estimates of value added and the Department of Commerce estimates of "national income originating" for the forest industries. The ratios of national income to value added computed for larger industry groups may then be applied to the more detailed groupings of the Census of Manufactures.

An example may serve to clarify the required procedure. In 1952, the value added by manufacture was 3,449 million dollars for the industry group "Lumber and Products, except Furniture."[1] The estimate of national income originating in this same industry group was 2,839 million dollars, which amounts to 82 percent of the amount of value added by manufacture.[2] A similar comparison of the "Furniture and Fixtures" group and of the "Paper and Allied Products" group discloses that the corresponding ratios of national income originating to value added were 79 percent and 81 percent, respectively. Apparently, a deduction of 20 percent applied to the value added figure will provide the needed estimate of national income for the minor industrial groupings. For all of these more detailed industrial groupings, there is a value added figure computed but not a national income originating figure. A similar procedure of

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[1] U. S. Bureau of the Census, Annual Survey of Manufactures, 1953.

[2] National Income, 1954, p. 177.

refining gross product to national income produced in Michigan must be employed at the other stages of timber production enumerated above, to raw timber products, and to value added by wholesale and retail trade, as well as to the value added by manufacture and to the value of new plant and equipment.[1]

Recreation

Scope

The economic contribution of recreation is the sum of the incomes accruing to wildland owners in a year through recreational use, plus the income component of the expenditures for new construction and producer's durable goods contributing to the recreation industry, plus the expenditures of government agencies for operations and investment in recreational improvements and facilities. Beyond such primary effects, the economic contribution of recreation further includes that part of the national income originating in the foods and eating, the sports equipment, the transportation, and a few other miscellaneous industries of Michigan which can be attributed to forest recreation. Forest recreation will be regarded as a broad combination of wildland oriented activities, including sight-seeing, hunting and fishing, wilderness travel, winter sports, summer resorting, and summer camping and vacationing.

Income accruing to the owners of wildland properties largely takes the form of income in kind, similar to the item "rental value of owner-occupied housing" in the national income and products accounts.[2] The degree to which recreational rights are leased or

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[1] A procedure analogous to that given in the example for the income arising from sales to recreationist is recommended. (see page 99)

[2] National Income, 1954, p. 46.

otherwise put on the market is very limited under Michigan conditions. To take care of this small amount, an item must be provided for the owners of deer parks who charge admission to the public and the like. Other forms of income from rental of cottages and homes for recreational use may better be measured through the renting public rather than through the income recipients.

Investments in new construction and the purchases of producers' durable equipment relate to the activities of businesses serving forest recreationists. Construction of new resorts and enlargement of old ones, purchases of trucks, boats, and other items to be used for profit all represent items which fall into this class.

The secondary effects of recreation include the income arising out of added activity occasioned by recreational occupancy and use. This activity must be over and above that which would occur even in the absence of Michigan-provided forest recreation. In this category fall the income from transportation, equipment and supplies, the added components of food and lodging and other recreation-related expenditures.

Sources

Finding the sources for the needed data is not so straightforward a matter as is the case with the sources for timber product data. The product mix which is to be separated out is closely entwined with non-recreational uses and the allocations needed are very difficult to determine. The Census of Business provides usable information on motels and other lodging establishments and on eating places which may be localized to the recreational districts by

counties and other small subdivisions. Certain specialized businesses which are allied with forest recreation, such as taxidermists, are covered in the Census of Business.

A large proportion of the supplies and equipment needed for recreational pursuits, including transportation expenses, are so widely dispersed among different classes of retail and wholesale establishments in all parts of the state that there seems little hope of extricating them from the records of enterprises,or from the Census of Business. Where federal excise taxes apply, tax records will show country-wide totals for the particular items covered. Purchases of hunting and fishing gear are specifically totaled in connection with the administration of the Pittman-Robertson and Dingell-Johnson grants to the states, based on the excise taxes paid on such gear.

Reliance for these important classes of recreation-induced expenditures must finally be based on some sort of estimate of the behavior of recreationists. The best way of making such an estimate is by questioning a sample of recreationists as to their purchases and investments. It is necessary also to know the total number of recreationists to which this sample is to be made to apply and the duration of their participation in the various forms of forest recreation available. Expenditures for transportation would be among the more orderly ones to calculate on the basis of distances traveled and a knowledge of car mileage costs.

Data gathered in other states points to a certain stability of expenditure pattern for hunters and fishermen as a group, the

well-interviewed portion of the recreational gentry. Results from three different states suggest a breakdown of some 40 percent of expenditures for equipment and supplies, 20 percent for transportation, 12 percent for food and lodging, 5 percent for clothing, and the remainder for a varying proportion of other goods and services.[1] It would be more satisfactory to have this information at first hand for the State of Michigan. A nationwide survey, now being undertaken by the U. S. Fish and Wildlife Service, may supply a part of this needed information.[2] One could wish the other classes of recreationists were as well covered with survey information as are the sportsmen. Some general guidelines may be available from surveys of vacationists of the American Automobile Association and the Curtis Publishing Company.[3] But, one gets the feeling that available data on the tourist industry of Michigan is slim and spotty, indeed.

Allocations

If it may be assumed that acceptable estimates of the required quantities could be made, substantial problems of allocation would still remain. The line of recreation is a hard one to find, as Dewhurst has pointed out in his able treatment of the subject.[4]

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[1]The averages are generalized from the studies of Couture, Royall, and Stains and Barkalow for Massachusetts, Idaho, and North Carolina, respectively.

[2]Journal of Forestry, "An Economic Survey of Sport Hunting and Fishing in the United States," Vol. 54 (Jan., 1956), p. 78.

[3]"Americans on the Highway," and "The Vacation Travel Market of the United States," respectively.

[4]J. Frederic Dewhurst and Associates, America's Needs and Resources (New York: The Twentieth Century Fund, 1955), Chap. 11.

A discussion of the problems of allocation will accordingly be provided next leading to some practical decisions on how to make the necessary allocations to wildland recreation as opposed to the rest of life.

The allocation of expenditures as between recreation and the rest of life may have to wait on a fuller exploration of the consumer mind. In the absence of such a further probing of motivations and behavior, the following arbitrary allocations are suggested as a starting point. Sales of food for home preparation would be excluded, but meals purchased by recreationists would be included. Expendable supplies, such as ammunition, bait, camera film, would be included, but the purchase of items of durable equipment would have to be treated on a judgment basis, item by item. Cameras, binoculars, sport clothes, and footwear, dogs and their care, and even guns, would have to be allocated on a percentage basis, partly to wildland recreation and partly to other activities.

Of course, gross expenditures by themselves represent too inclusive a measure of the contribution to the Michigan economy of recreation. The same reduction to "national-income originating" as was proposed for the product of forest industries is called for in the case of the recreational products. A practical way of doing this would be to find the appropriate percentage of retail sales which represents national income arising in wholesale and retail trade. Comparison of national income statistics with sales volume

figures from the Census of Business will supply the needed proportion. Recreational goods manufactured in Michigan would be carried back to the point of manufacture on an income basis.[1] Those goods coming in from outside the State would not be carried back that far.

An idea of the size of the national income component in retail sales may be gained by comparing national income originating in wholesale and retail trade for the year 1948 with the total volume of retail sales for that year. Retail sales in 1948 were 130 billion dollars.[2] The amount of national income originating in retail trade was 28 billion dollars and in wholesale trade 13 billion dollars.[3] Since wholesalers made only half of their sales to retailers, the figure for national income originating in wholesale and retail trade to be compared with retail sales is 34.5 billion dollars. On this basis, the desired ratio is 18 percent of sales as the proportion which can be counted towards national income. It is such a proportion as this which must be applied to purchases of recreational consumers at retail in order to get the adjusted national income totals sought. This reduction of sales to income originating from sales is the largest and most important of the allocations to be made.

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[1] Difficulties of isolating such goods might oblige one to omit this item from the scheme.

[2] Census of Business, 1948.

[3] National Income, 1954, p. 177.

VII. SUMMARY

Measuring Economic Importance

A growing population and advancing levels of living make added demands on the wildland resources of Michigan. A growing industry demands more forest raw materials. Working people with shorter hours of work and more money to spend demand more wildland in which to spend their leisure and refresh their bodies and spirits. At the same time, the lag in the economic advancement of large forested areas of the state calls for attention and some kind of remedial action. Public land administrators and legislators need guidance in the midst of these conflicting demands. How can priorities be established to govern the allocation of wildlands between uses which are sometimes competitive?

One approach to establishing priorities of use for these wildlands is in terms of measuring the present importance of the two major uses, namely, timber production and wildland recreation. Timber production results in measurable physical product and is the basis for substantial timber-using industries whose economic effects may readily be evaluated. Forest recreation, on the other hand, is a different type of activity. It produces little visible product. Its large economic importance expresses itself indirectly in the numerous recreation-related activities which accompany recreational enjoyment, such as purchases of equipment, travel, food, and lodging. To find a common means and framework for appraising two such

unlike "industries" suggested itself as a piece of research to be done preliminary to actually making the economic comparison.

A review of existing appraisals of the economic contributions of forest recreation strengthened the impression that thought must be given to forming a plan capable of measuring the economic contributions of timber and recreation in Michigan in comparable terms. Economic value produced by forest recreation tended to be estimated either too narrowly in terms of pounds of wild meat in the possession of hunters, or too broadly in terms of a mixture of gross sales at retail and payments of property taxes to government. The problem appeared to be to form a reasonable concept of economic importance in a statewide framework and then to show that such a concept was capable of being translated into practice without an unreasonable expenditure of time and money.

Income accruing to Michigan people was readily accepted as the desirable criterion for making the economic comparison. Wealth is of little avail without income. Employment is of minor consequence if productivity and, hence, income are low. The advantages of making use of the general framework provided by the national income and product accounts of the U. S. Department of Commerce appeared to be overwhelming. These accounts provided a complete and orderly framework in which to consider income systematically, giving both a complete and a non-duplicating view of the phenomena of income. Moreover, the national income and product statistics themselves provided controlling overall totals and showed a structure of relationships that would prove to be valuable in fitting in statistical data

derived from other sources.

National income accounting measures the national income either as the value of products or the sum of payments to factors of production engaged in making those products. Either or both of these approaches might therefore be used in measuring the kinds of income of immediate interest in the present study. Measurement of product proved to be the more feasible method in the case of both forestry and recreation. It was found necessary to deduct charges for capital used up in production and payments made for services not contributing anything to production, in order to convert the measurement of income from gross product to national income.

The way in which product had to be measured was substantially different for the one use as contrasted with the other. Timber products were carried forward from forest raw material to the highest level of production attained in the state by that material, at or near the level of final consumption. Recreational products, that is the goods and services whose production was occasioned by recreational use of wildlands, were more readily measurable at consumer level with only minor adjustments being needed.

Retail sales occasioned by recreation are by no means all income to the Michigan economy. This investigation suggested that the income originating in such sales is of the order of 20 percent of their gross value. It is necessary that the system of income measurement reflect this important fact.

Income produced is not the sole determinant of importance in general. Conservation and free public recreation are examples of

non-income values which are important to Michigan people. An income comparison does not encompass these other values. Similarly, the importance of higher education can not be stated in terms of the added business which results for book stores, the value of the construction of new school buildings, and the salaries of professors. No more would one dare measure the importance of the national defense effort in terms of its vast economic thrust. However, to the very large extent that the income status of Michigan residents is held to be important, then a measurement of economic importance in terms of income effects is relevant and timely.

Related Research Needs

The present study is offered in the hope that the method here outlined will be implemented. The resulting income comparisons, it is believed, will be of value in setting policy. It is well at the same time to suggest the connections of this approach with other significant approaches to the evaluation of forest land policy, and to suggest some related research needs in this area which remain unfilled.

Because of the large measure of government ownership of wildlands and because of the semi-public character of the recreational opportunities of even the privately owned wildlands, political and administrative decisions rather than the impersonal operation of the market mechanism govern the allocation of resources to wildland recreation. Yet, the knowledge of the production function for recreation is far from satisfactory. The relationship between inputs of units of recreational land and other resources on the one hand

and outputs of recreational use and secondary income flows is far less straightforward than the corresponding relationship for timber. Predictions of yields of timber, or even of deer, are more soundly based than estimates of the carrying capacity of forest land for deer hunters and other recreationists. Since timber and recreational use are commonly joint products of units of wildland, a knowledge of their production inter-relationships over a wide range of conditions is greatly to be desired. It is a matter of experience and observation that these inter-relationships are sometimes complementary and sometimes competitive. There is a need for establishing the extent and character of these inter-relationships. The factors which are most significant in affecting yields and determining the levels of maximum output should be identified.

The devotion of resources to group enjoyment, as in wildland recreation, at some point leads to a diminution of other product which might have been created had such resources been used for income-producing purposes. It might be desirable to calculate the cost of the added enjoyment in terms of income foregone. The exploration of the opportunity costs of forest recreation might, therefore, be a worthwhile research undertaking. Related to such a project would be the evaluation of the unappropriated benefits and the unpaid costs which accompany the use of wildland for recreation.

APPENDIX

SOURCES OF DATA ON INCOME AND PRODUCT

United States Government publications

United States Bureau of the Census

Censuses of Population and Housing, 1950 (Decennial)
Census of Agriculture, 1955 (Quinquennial)[1]
Census of Manufactures, 1954 (Periodic)[1]
Census of Business, 1954 (Periodic)[1]
Annual Survey of Manufactures, 1953 (Annual)
County and City Data Book, 1952 (Periodic)
County Business Patterns (Quarterly, jointly with U. S. Bureau of Old-Age and Survivors Insurance

United States Department of Commerce, Office of Business Economics

National Income, 1954 (Periodic), book length supplement to the Survey of Current Business
Survey of Current Business:
National Income Number, July 1955 (Annual)
Personal Income by States, September, 1955 (Annual)

United States Bureau of Labor Statistics

New and Maintenance Construction: Construction in the 1947 Inter-Industry Relations Study, BLS Report No. 2, Washington, D. C. February, 1953.

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[1]In process of publication, February 1956.

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