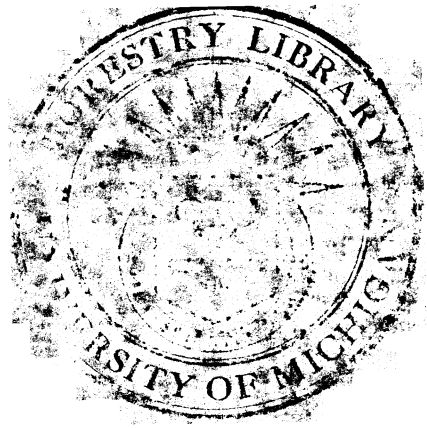
Gunderson, Glenn K.
Study of community forests; their possibilities in Michigan, & a community forest plan for the city of Dexter, Mich.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A STUDY OF COMMUNITY FORESTS; THEIR POSSIBILITIES IN MICHIGAN AND A COMMUNITY FOREST PLAN FOR THE CITY OF DEXTER, MICHIGAN.

by

Glenn K. Gunderson

A Thesis Submitted to the Graduate Faculty
in partial Fulfillment of the Requirements
for the degree of

MASTER OF FORESTRY

Approved:

School of Forestry and Conservation
University of Michigan
1941

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I-INTRODUCTION

The people of this country have cut, consumed, and wasted more timber during the last one hundred and fifty years than has been destroyed in any similar area and time in the history of the world. Instead of being cropped, large areas have been thriftlessly exploited and mismanaged. Of the 3,000,000 square miles of continental United States, it is estimated that two fifths were covered with forest. The pioneers never thought of the forest as a crop. It seemed to them that there was an inexhaustible supply of trees. Their problem was to clear the land to make way for annual crops that would provide food and clothing.

As a consequence of this misuse, millions of acres of land once fertile and productive are now denuded and unproductive. Each year an average of one and one half million acres of worn-out agricultural lands are being dropped from use. The natural resources of many American communities have been used with little thought of the future and at present are no longer able to support the population. Millions of Americans have lost their jobs directly or indirectly through this practice of wasteful exploitation.

One way to regain some of these lost jobs is by rebuilding depleted natural resources. Idle and misused land should be put back to work producing raw materials.

It was because of this very evident need that the first

community forests were established. People began to see that there was a general need for protection and rebuilding of our depleted forest resources. It soon became evident to some forward-looking communities that this program could very well begin in the immediate vicinity of our cities and villages. As a result about 2,000 communities now own and operate nearby forest properties and some are already yielding substantial returns.

A community forest consists of lands operated for forestry purposes by a village, town, city, school district, township, county, or by other community or group enterprises, such as schools, hospitals, churches, Boy Scouts, Girl Scouts, Y.M.C.A., and Camp Fire Girls. They may be known locally as town, city, municipal, neighborhood, school, church, or city watershed forests, or as village or town woods, as well as community forests.[1]

The purpose of this study is to investigate the progress that has been made in this field, the reasons for the establishment of these forests, the benefits derived from them and so arrive at some conclusion with regard to their future possibilities in the nation's forestry program and especially in the State of Michigan where idle land constitutes an important problem.

1- Anon. Why Community Forests? U.S. Dept. of Agric. Circular, Washington, D.C., 4pp.

II-REVIEW OF THE LITERATURE

The literature on the subject of community forests is limited to periodicals and a few brief bulletins and pamphlets published by the United States Forest Service. All of the material to be found is written from the standpoint of trying to interest the public in creating these forests. Consequently all is written in popular style and the advantages are given great emphasis with very little written on the difficulties and disadvantages that can arise in a community forest program.

By far the most important contribution to the literature in this field has been made by Nelson C. Brown.[1] His recent writings are based on approximately 25 years of interest and intermittent study of community forests both in Europe and the United States. Part of his work in this field has been done while employed by the United States Forest Service. His article in the July issue of the Journal of Forestry 1938[2] gives a good account of the success of community forests in Europe, especially from the financial standpoint, and he presents the objectives, advantages, and possibilities of such projects in the United States. He writes that the principal reasons for the establishment of community forests in Europe are profit and recreation. He indicates that the methods

1- Brown, Nelson C., Professor of Forest Utilization, New York State College of Forestry, Syracuse, N.Y.
2- Brown,N.C. Community Forests: A Neglected Phase of the American Forestry Program, Jour.of For. July 1938 p.687.

used in Europe can be applied in this country without difficulty. This may be true in some of our rural communities but for the most part, because of differences in the land ownership and status, there may often be problems involved that were not encountered in the creation and operation of European forests.

Brown reviews the progress made in community forests in the United States in the Journal of Forestry, January,1939 issue.[1] He outlines the stages of development from the earliest community forest at Newington, N.H. established in 1710. He gives a summary of the reports received from the various states that have community forests and the benefits derived from them. He writes, " There is every evidence to indicate that the community forest program is making distinct progress in the United States. It is a seriously neglected phase of the public ownership program of American Forestry." He concludes the article by saying that not one community forest already established has been abandoned. The article indicates great possibilities for such a program in this country.

Another article by Brown in the January issue of American Forests,[2] 1939 again presents the advantages that are realized from community forests. He cites reports from a number of states and organizations that have community forest projects in operation and again points out the benefits

1- Brown,N.C. Progress in Community Forests, Jour. of For. Jan. 1939 p.25.
2- Brown,N.C. Community Forests Come of Age, American Forests, Jan. 1939 p.16.

claimed for each and the fact that in 1939 there were about 40 technically trained foresters devoting all of their time to community forest work. He concludes by writing: " In the future, community forests may play as important a part in the life of our people as they have for hundreds of years in the lives of the people of Europe. There is an intimacy about them that will give forests and forestry a new meaning to Americans -- and benefits that will give life a new significance in its relation to trees and people."

P.M. Barr[1] of the Research Division, British Columbia Forest Service, presents the need of community forests in the Canadian forestry program. He writes that public opinion is favorable toward more intensive management of Canadian forests but there are no places where such a practise can be seen by the people. He is of the opinion that demonstration forests should be established to show exactly what can be accomplished in making forests pay dividends. He points out the large number of small cities of Canada that could very profitably utilize unproductive lands in nearby areas. He cites the success of the community forest owned by the German city, Villingen and the Eli Whitney Forest near New Haven, Conn., also New York State's community forest program. He advocates the establishment of many, small forests for demonstration purposes and also points out that these projects will yield profitable returns of wood and money and at the same time

1- Barr, P.M., Community Forests a Need of Canadian Forestry, Canadian Woodlands Review Jan. 1931, p.22.

will be convincing arguments for the development of Canadian forestry.

Harris A. Reynolds[1] has done much to spread the community forest idea and has made several important contributions to the literature. His writing is confined mainly to conditions in the State of Massachusetts. In a recent bulletin[2] he reviews the progress of town forests in this State during the past quarter century and mentions the methods of acquiring land for this purpose, revenue produced by Massachusetts town forests, recreational use as well as other uses, and he answers a number of popular questions on this subject. He also presents the general needs in town forest development. He states: " Thousands of our citizens obtain their living directly or indirectly from woodusing industries. To maintain these industries here, it is desirable, if not absolutely essential that the raw materials be produced near at hand. To grow a crop of commercial timber requires a large part of a lifetime and therefore the private owner of the forest land has not been interested in timber production. Successful timber growing requires that the land be in permanent ownership to insure a continuous policy. In other countries this has been accomplished chiefly through public ownership -- a field in which the town forest has played an important part."

Brown's recent article in the Journal of Forestry gives

1- Reynolds,H.A., Secretary of Massachusetts Forest and Park Association, Boston, Mass.
2- Reynolds,H.A. The First Quarter Century of the Town Forest in Massachusetts. Bulletin No. 163 of the Mass. Forest and Park Association, Boston, Mass.

an excellent account of the present status of community forests in the United States.[1] He discusses the importance of the community forest in European forestry briefly and then offers a very complete discussion of all aspects of the problem as it exists in this country. The objectives and advantages are effectively presented and he lists the types of ownership and jurisdiction that are most common. He states that many of our community owned forests are being used as a combination forest and park and that this idea of multiple use is very popular in Europe and has been worked out satisfactorily there. He traces the progress of community forests and presents the results of a survey carried out by Ernest Buhler with regard to the latest development in this field and the reasons for establishing community forests in the various states. The most notable achievements for 1940 are listed and he concludes by stating that, " there should be more and better community forests throughout the nation if forestry is to move forward and if it is to penetrate deeply into the conservation consciences of our people."

The above mentioned articles constitute the most important contributions to the periodical literature on the subject. The United States Department of Agriculture Forest Service has issued a few pamphlet forms that make up the remainder of the available information. All are written to in-

1- Brown,N.C., Community Forests: Their Place in the American Forestry Program, Jour. of For.,Feb., 1941 p. 171.

terest the public in community forests and consequently deal entirely with the advantages realized from such projects. Some contain detailed reports of the experiences of various municipalities with this development. All are listed in the bibliography below.

III- THE INVESTIGATION

A- Sources and Method of Procedure

1- Library sources

The major part of the investigation of this subject has consisted of an examination of the literature as contained in the library of the School of Forestry and Conservation. All literature directly related to this subject has been read and the contributions of significance are included in the bibliography. The periodicals and United States Forest Service publications have made up the main source of information.

2- Correspondence

Officials of the Michigan Department of Conservation and The United States Forest Service have made suggestions and contributed several items of information that have been helpful in this study. Other individuals who have been active in community forest work have answered questions and volunteered suggestions that have been a considerable aid.

3- Field work

Much of the information necessary for the formation of the community forest plan for the city of Dexter has been pro-

cured on the area used. A timber survey of the present growth on the area was made and some effort was put forth to determine soil types before any recommendations were made with regard to a choice of species for planting on any part of the area. Mapping and the planning of planting areas and recreation spots were also done in the field.

B- Findings

1- Community forests in Europe

Community forests represent the most popular, successful,and profitable phase of the entire forestry program in many sections in Europe. It was there that the community forest idea originally arose as an outgrowth of the old "Village common" practise in which common ground was used for pasture and as a source of fuelwood. Many of these forest areas have been carefully managed for nearly 1,000 years and have played a very important part in the lives of the people of European communities.

More forests are operated, in some parts of Europe, by the communities than by private, state, or national agencies. This is true in Switzerland where two-thirds of all the forests are owned by the communities, and in the German Black Forest region and the State of Baden, and sections of the Vosges region of France.[1] About 20 per cent of all the forests

1- Brown,N.C. Community Forests, U.S. Dept. of Agric. Bulletin 1939 p.21.

of Germany and France are owned by the communities. Throughout Europe, the city or town without a forest is an exception.

Community forests in Europe vary in size from small areas of a few acres to as much as 62,500 acres. In Germany 40 per cent of the area of community forests is in units of more than 1,235 acres, 43 per cent in units of 247 to 1,235 acres, and 17 per cent in units less than 247 acres. Many of the smaller communities which own relatively large forest areas have reported annual revenues large enough to pay a part and sometimes all of the municipal expenses including those of fire protection, schools, hospitals, and roadway construction and maintenance. Net annual revenues of $3 to $8 per acre are reported as fairly common.[1]

Some examples of the most successful community forests in Europe are those owned by Thun and the Sihlwald in Switzerland, Epinal and the Jura communes in France, and Dien - hausen, Memmingen, Freudenstadt, Baden-Baden, Gausbach, Oberharmersbach, Heidelberg, Braunlingen, Grunewald, Roten - bach, and Zastler in Germany.

The report on the city of Baden-Baden is typical and shows how the European community forests are used. This is a famous watering and bathing resort in the Black Forest and has a permanent population of 30,000 people. It entertains more than 100,000 visitors annually. The city is almost sur-

1-Brown, N.C., Community Forests, United States Department of Agriculture Forest Service Bulletin 1939 p. 21.

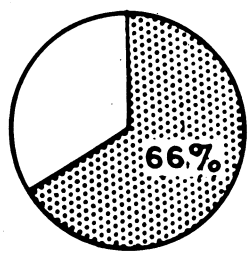
AREAS OF COMMUNITY OWNED FORESTS

IN COUNTRIES AND REGIONS ABROAD AND IN THE

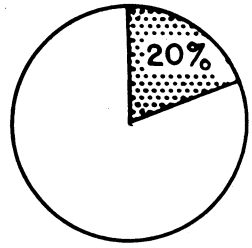
UNITED STATES

(as compared with total forest area)

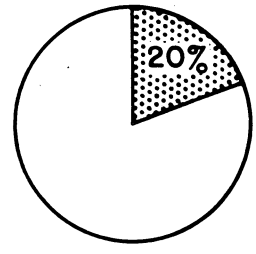
The circle represents total forest area (100%)
Shaded segment represents portion (%) of
total area which is community owned.



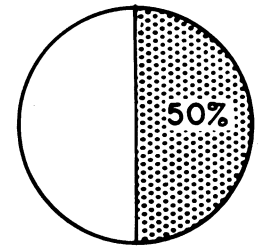
SWITZERLAND



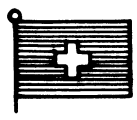
FRANCE

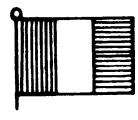


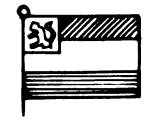
GERMANY

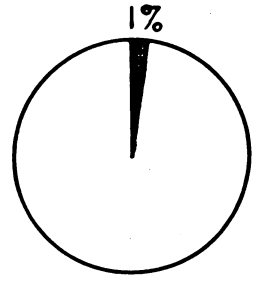


BULGARIA

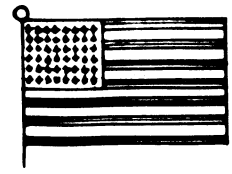


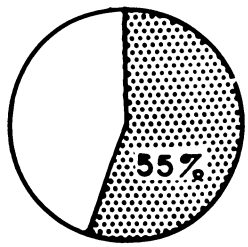






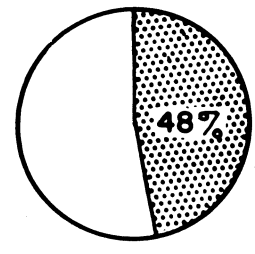
UNITED STATES





BLACK FOREST AREA
OF GERMANY

DIVISION OF
STATE COOPERATION



STATE OF BADEN-BADEN
GERMANY

rounded by a forest of 13,500 acres of spruce, silver fir, beech, and pine. The gross income from the forest during a recent year was $340,000. The expenses were $222,210 so a profit of $117,790 or $8.75 per acre was realized. This forest employs 172 men, of whom 100 are temporary. The temporary workers are used for part of the year on the forest doing planting, fire protection work, and logging. The remainder of the year is spent on their farms nearby or within the forest.[1]

The village of Dienhausen in Bavaria is an example of a small city having a forest. It has a population of 139 people in 26 households. It owns a forest of 63 acres composed of Norway spruce. This forest has yielded an average annual income of $1,608 for a period of 12 years. The community has used this money to build a new water reservoir, a new school house, a village dairy house, and a blacksmith shop. The forest employs 10 men for part time work.[2]

The city of Berlin owns a forest of 62,500 acres which looks very much like a park but has yielded unusually large revenues. A 10,000 acre unit of this forest, called the Grunewald, yields an annual gross income of from $160,000 to $200,000. The annual expenses are $24,000 so the annual profit varies from$136,000 to $176,000. The average net yearly income over a period of 12 years was $152,000 or $15.20 per

1- Brown, N.C., Community Forests, United States Department of Agriculture Forest Service Bulletin 1939 p.21
2- Ibid p. 23

acre from the sale of wood products. This forest is made up of 85 per cent Scotch pine and 15 per cent beech and oak. Timber products bring good prices because of its proximity to a large city. Transportation expense is at a minimum. Very close utilization of all wood growth, including thinnings of planted stands, is practised on this forest and all other community forests of Europe.[1]

In the State of Baden in the Black Forest five villages with populations of from 248 to 2,034 people own forests of from 1,273 acres to 4,760 acres. The net yearly income per family from these forests varies from $28.24 to $116. This is more than the average family tax bill. Net per acre incomes from these forests has varied from $2.04 to $9.02 annually.[2]

The city of Zurich, Switzerland has a forest of 4,000 acres which has been carefully managed for 500 years and has been owned by the community for 600 years. This forest shows a net return of $12 per acre per year and employs one man for every 33 acres.[3]

These examples serve to show the prominence and success of community forests in European countries. Many of these communities are entirely dependent upon their forest area for their livelihood. For centuries the forests have been crop-

1- Brown,N.C., Community Forests, U.S. Department of Agriculture Forest Service Bulletin 1939, p.23
2- Ibid p.24
3- Anon. Community Forests, U.S. Department of Agriculture Forest Service Bulletin 1939 p.2.

ped instead of being thriftlessly exploited and mismanaged as has been the case over large areas in the United States. They are the prevailing type of forest ownership in Europe and are still expanding.

2- Development in the United States

The community forest idea in the United States is believed to have had its origin in the Newington, New Hampshire community forest which was established in 1710. This forest of 112 acres has supplied cordwood, lumber, and bridge timbers for the town's use for more than two and a quarter centuries. Other New England communities have followed the example set by this town and the movement has spread gradually so at the present time it is estimated that there are about 1650 community forests[1] in the United States and about 4 million acres are devoted to them. Approximately 180 million trees have been planted on them to supplement existing timber growth and natural reproduction and to reforest denuded areas.[2]

The development of community forests in the United States can be divided into four general eras as follows:[3]

a-Exploratory or initial stages during which there were many magazine articles and other publicity due to the European visits of several American foresters, public

1- Brown, N.C., Community Forests; Their place in the American Forestry Program, Jour. of For. Feb. 1941 p.171
2- Ibid
3- Brown, N.C., Progress in Community Forests, Jour of For. 1939 Vol. 37 p.25

officials, and other persons who were interested in the development abroad.

b- The second era was one of public enlightenment and education regarding the advantages of community forests. This stage may also be called the promotional stage of the community forest movement.

c- The third was a period during which many laws were enacted which provided for their establishment. This was a direct result of the public agitation of sentiment favorable to community forests.

d- The era of establishment and management. This is the stage of development which has just come into being and which is showing definite progress.
(A more detailed discussion of the progress in community forest development will be given below.)

3- How community forests are started.

Community forests are usually started by some public-spirited individual or group that is interested in contributing something to the welfare of the town in which they live. Reports indicate that local school superintendents, mayors, county leaders, extension foresters, luncheon clubs, Boy Scouts, Girl Scouts, Women's Clubs, legion posts, garden clubs, Izaak Walton League, and similar groups have been most effective in starting these movements. In some cities, special laws provide for local official committees to be appointed by the mayor

to formulate programs.

4- Types of land suitable for community forests.

Any type of land which will produce a satisfactory forest growth has been found suitable for community forests. The land should be less than 20 miles from the city, beyond the real estate speculative districts where relatively low value land may be acquired for from $2 to $10 per acre. Suitable land consists of any of the following types of cover:[1]

a- Old stands of forest growth. This type is usually best because it provides excellent recreational advantages and in many cases the land has produced enough valuable timber to liquidate the investment or pay for maintenance charges or both.

b- Young second growth. This type of stand makes up many of the watershed type of community forest. In some cases a profit has been realized from thinning or other silvicultural operations on these forests. They are also used for recreation.

c- Cutover forests and abandoned or idle agriculture land. This type is common in the New England States, New York, Wisconsin, Michigan, and Pennsylvania. This land usually requires planting and planting stock has been made available, free or at cost, for this purpose by many states. Large areas of this type of land

1- Brown, N.C., Community Forests; Their place in the American Forestry Program, Jour. of For. Feb. 1941 p. 172

have been planted in the states mentioned and also throughout the South.

d- Hilly, eroded slopes and steep topography not otherwise used or productive. This type of land is often planted for the improvement of scenery along highways. It presents some difficulties and is often not capable of producing valuable timber crops as early as other types of land.

It is an advantage to have the land in one block but this is not considered necessary. Some of our community forests are made up of as many as five separate units.

In Michigan many of the counties have adopted a zoning plan for designating the purpose for which the land may be used. One of these uses is timber growing. Any of the tracts designated to be used for forestry purposes are suitable for community forests.

5- <u>How lands are acquired</u>.

The lands upon which community forests are now growing have been acquired in a number of ways. The most common of which are as follows:[1]

a- By direct purchase. This method is the most expensive but often is very satisfactory because the original investment may have to be liquidated and their is

1- Brown, N.C., Community Forests; Their place in the American Forestry Program, Jour. of For. Feb. 1941, p.173

greater chance of the forest being operated on a revenue basis rather than for the indirect benefits.

b- By acquisition of tax- delinquent or tax- reverted lands. These lands can usually be acquired at a very low price. In some states these lands have been deeded to communities without any charge if the community has presented a plan for the development of the area for a useful purpose. This method has been widely used in Wisconsin, New York, Michigan, and to a lesser extent in New England, South Carolina, and other states.

c- By gift from individuals, associations, or public-spirited groups. About one third of the community forests in New England were started in this way. Some of these gifts have been in the form of memorials to outstanding men.

d- By utilizing lands that are already in the possession of the municipality such as poor farms, asylums, or other property.

e- By the use of reservoir or watershed sites. Some of the largest and most important and successful municipal forests are of this type. They are very prominent among the community forests of the eastern United States. Seattle, Washington has a watershed forest covering 63,300 acres.

6- Objectives, advantages, and uses of community forests.

The development of these forests over the country nat-

urally involves objectives, advantages, and uses that vary with their location. The more important of these are summarized here as follows:[1]

a- An improved and better balanced land utilization. It is estimated that there are approximately 50,000,000 acres of idle, submarginal and waste land in this country, much of which lies from one to twenty miles from centers of communities. This unproductive land is considered a source of serious economic waste and inefficiency. Community forests could occupy a large portion of this land and thus make the land productive and it could be a definite asset rather than a serious liability.

b- Financial profit from community forests. Because these forests are a relatively new development in America there are few that have shown definite financial returns in the form of net profit. The net income from European community forests frequently averages from $3 to $8[2] per acre per year. In eastern France there are 25 communities that have been tax free for many years because of the financial returns from their forests. This condition also prevails in parts of Germany, Switzerland, and Sweden.

In most cases in the United States community for-

1- Brown, N.C., Community Forests; Their place in the American Forestry Program, Jour. of For. Feb. 1941 p.174
2- Brown, N.C., Community Forests, Close to Home and Serving Local People, U.S. For. Serv. Bulletin 1939 p.21

ests have been started on lands depleted of forest growth. They have not been in condition to produce immediate cash returns. We do have some forests, however, that have yielded substantial profits to the municipalities that operate them.

In New Hampshire, the town of Danville has operated 77 acres of forest land almost from the time that the town was established in 1760. In 1930, the committee in charge reported an in come of $4.45 per acre per year from all sources. Newington, New Hampshire has a town forest of 112 acres from which $6,000 worth of timber has been sold during the past 50 years. The value of the standing timber is now estimated at $5,800. About $1,000,000 has been received from the sales of mature timber on the Seattle watershed forest of 63,300 acres. More than $13,000 net profit has been realized from the Essex Junction, Vermont forest.[1]

c- Watershed protection and maintenance. This is the most important function of a large number of the community forests of this country. It is a well known fact that forests aid in checking run-off and that no other vegetative cover equals that of the forest in this respect. The community forests of the East have been found very helpful in preventing silting of city water-reservoirs. Examples of such silting are numerous, according to the

1- Anon. Community Forests, U.S. For. Serv. pamphlet, 1939 p.5

United States Department of Agriculture Miscellaneous Publication 331, The Land in Flood Control.

"Extreme cases have occurred in the southern Piedmont. Thirteen major reservoirs there, with dams averaging 30 feet in height, have completely filled with eroded material. Their average useful life was 29.4 years.

"A municipal reservoir built near Spartansburg, South Carolina, at a cost of $470,000, lost 17 per cent of its original storage capacity in 8 years. Another near Waco, Texas, costing $2,000,000, filled one-sixth with silt in less than 6 years after construction. Lake Olathe at Olathe, Kansas, costing $42,000, filled 10 per cent in 5 years."

It has been found that control of erosion in the drainage basins is the only economical and practical method of dealing with the silting problem. Other methods have been tried and found ineffective. The cities of Glens Falls; New York; Little Falls, New York; Westfield, Massachusetts; Ruthland, Vermont; Seattle, Washington; Canton, North Carolina; Reading, Pennsylvania are among those which are using forests to maintain a a pure and adequate supply of water for their population.

d- Educational purposes. A large number of our community forests are being used as demonstration projects to

show what can be done in the practice of forestry on these lands. Wisconsin, Michigan, Pennsylvania, and new York have many school forests that are used in this way. Usually these forests are reforestation projects operated by school children, Boy Scouts, or similar organizations and they serve as outdoor laboratories for nature study. In the South and some other regions the men in charge often demonstrate how to raise timber as a profitable crop in either natural or planted stands.

e- Local employment. In times of business recessions our community forests have been used as reservoirs for emergency employment. Generally one permanent worker is employed for each 100 acres in Europe but in some cases the ratio has been as high as one to each 20 to 40 acres.[1] Large numbers of men are often temporarily employed in construction activities, planting, woodland thinning,and pruning, road repairs, and general improvements.[2] There are about 47 technically trained foresters employed in connection with community forests.

A report on the development of the 1,746,000 acres in Wisconsin county forests shows the possibilities of such forests as a source of employment. During the years 1933-37 a program was undertaken with the help of

1- Anon. Community Forests, U.S. Dep't. of Agric. Forest Service Bulletin b19, p.5
2- Brown, N.C., Community Forests, Their Place in the American Forestry Program, Jour. of For. Feb. 1941, p.175

the Civilian Conservation Corps and other labor which included the planting of more than 32 million trees. The program also included improvement by thinning and other cultural treatment of 23,000 acres of timber stands, building of nearly 2,000 miles of truck trails, reduction of the fire hazard on 192,000 acres, the construction of 336 miles of fire breaks, and the building of nearly 3,000 miles of telephone lines and 21 look-out towers for fire control. Fifty five recreational camp sites were developed, 111 fish rearing ponds were constructed, and 703 miles of trout streams were improved.[1]

It appears that community forests offer definite opportunities for additional professional and unskilled employment in our country.

f- Recreational use of community forests. This is the outstanding benefit from these forests in some communities, especially during the initial stages of its development. They serve as nearby outlets for spiritual, mental, and physical relaxation for the low income family groups who cannot afford the time and expense for extended or distant vacations. It has been felt for some time that there is a great need for outdoor recreational facilities to accomodate the people of our densely populated sections. The community forest is being used widely

1- Anon. Community Forests in the United States, U.S. Dep't. of Agric. Forest Service Pamphlet B26

to serve this general need. Some of them are known locally as parks or forest parks. These are fully equipped with playground facilities.

An example of a community forest which features recreational use is that of Onondago County, New york. This county acquired a forest of 2,400 acres in 1929. The area has been reforested by planting and while the trees are growing a part of the forest has been set aside for recreational use. An abandoned farm house has been remodeled and is used as a lodge by Sunday schools and church groups for week-end parties and picnics. A charge of $1 is made for this privilege. There has been great demand for the use of the lodge and to meet this demand another lodge has been built from timber cut onthe property. The recreational equipment provided includes swings, shuffle boards, horseshoe rinks, swimming pools, nature walks, bridle paths, and archery grounds. A fish hatchery and pheasant raising yard also add interest to this community forest. It has grown in popularity and in a recent year more than 50,000 persons visited it.[1]

g- Scenic improvement. Added attractiveness and more inviting surroundings for both residents and visitors have become important features in the development of many sections of our country. Communities forests have been

1- Opp. Cit. p. 7

used much to convert unattractive and unproductive waste land into beautiful and profitable timber-growing areas which have proved to be a real asset to the cities which own them.

Roadside forests have been used in some areas to improve the appearance of highways and to provide drive-out picnic grounds. Where such developments have been sponsored by the community, various recreational features have been supplied to serve both the neighborhood and the travelers.

Community forests are developed also in the form of streamside forests. The State of Indiana has undertaken development of riverside demonstration forests in which recreational use and timber production are the major objectives. At the same time they serve to beautify the borders of these streams and protect them from erosion.

h- Wildlife and wild flower sanctuaries. Although some of our community forests serve as important outlets for hunting and fishing as a part of recreational management, many have been set aside as wildlife refuges. Wisconsin has 403,700 acres in a deer refuge which is principally in county forests.[1] The partridge, squirrel, rabbit, and raccoon are typical forest animals which are found in the smaller community forests while deer and other

1- Brown, N.C., Community Forests, Their Place in the American Forestry Program. Jour. of For. Feb. 1941 p. 175.

large game animals inhabit the larger tracts. The game population has been found to increase as much as 40 per cent in five years on some of our national forests.[1] When this occurs the refuge contributes to better hunting on surrounding lands.

Nature lovers and photographers find a community forest an ideal place to study animals, birds, and plant life.

i- Stability of ownership. One of the main reasons for the poor condition of our forests is the frequent changes of ownership. The policies of management change with change in ownership. The community is a permanent establishment and it gives permanence of policy in forest management in the forests which are under its jurisdiction. Thus the principles of sustained production and use are assured and there is greater stability of employment and operation.

j- Low cost of establishment. Because most of our community forests are established upon idle, unproductive land the initial expenditure in starting such a project is usually relatively small. Most of the Michigan and Wisconsin projects have been started on tax reverted lands which have been deeded to the counties or cities without charge. In other sections of the country these unproductive or abandoned lands have been acquired at a

1- Opp. Cit.

cost of from $2 to $10 per acre.[1] Planting stock is usually supplied at cost or free of charge depending upon state policies.

k- Multiple use of community forests. Community forests, in many places, are a combination of forest and park. This is also very common in Europe. A forest may be equally as popular as a park and at the same time be a source of revenue instead of being operated at an expense. In the development of these forests in Europe there have been no conflicting objectives. Timber production and cutting, park features, game management, employment, and other features go hand in hand but are not necessarily on the same areas. This combination of objectives has been found to work out very satisfactorily.

This combination of forest and park has been exemplified by the Berlin community forest of 62,500 acres which has been discussed earlier in this thesis. One unit of this forest of about 10,000 acres is locally known as a forest park and is visited daily by as many as 100,000 people for recreational activities such as hiking, picnicking, and boating. This unit has the appearance of a city park. No timber along the highways, lakes, streams, and picnic areas is cut but in the hinterlands the most intensive forms of forestry are practised and the forest is yielding a substantial profit.

1- Brown, N.C. Community Forests, Their Place in the American Forestry Program, Jour. of For. Feb. 1941, p. 175.

7- Types of Ownership.

Community forest ownership is of five types which may be classified as follows:[1]

a- County forests as developed in Wisconsin, New York, and Illinois.

b- Township or town forests. This type is common in New England, New York, and some other states.

c- School or school district forests as in Wisconsin, Michigan, and New York.

d- Village forests as in New York and the Lake States.

e- City forests. This is the most common type and is found in every state that has any community forests.

8- Types of Jurisdiction.

Nelson C. Brown has listed the organizations that handle our community forests as follows:[2]

a- Municipal water departments or engineers whose primary duty is the supply of water. This is notably true in such communities as Little Falls and Glen Falls, N.Y.; New York City; Boston; Ashville, N.C.; and many others.

b- County boards with state supervision as in Wisconsin.

c- County park or planning boards locally independent and without state supervision as in Erie, Oneida, Onondago, and other counties in New York. Within this cat-

1- Opp. Cit. p. 176. Brown
2- Ibid.

egory may also be included committees of county boards of supervisors.

d-Town forest committees as in New England.

e-General supervision by state foresters or through a system of district foresters, as in several southern states, Illinois and elsewhere.

f-School boards as in Michigan, Wisconsin, New York, and Pennsylvania.

9- Sizes of Community Forests.[1]

These forests vary in size from areas of one to five acres to 63,000 acres. Newark, N.J. has a community forest of 37,000 acres and the largest forest of this type is owned by Seattle, Wash. which has a watershed forest of 63,300 acres. The average size of the 636 community forests in New York is 242 acres. Harris Reynolds reports that the average size of those in Massachusetts is 300 acres and the variation is from 6 acres to 6,720 acres in area. Most of the larger forests have begun as relatively small areas and have gradually expanded to their present size.

10- Special Laws Pertaining to Community Forests.

In most states the laws permit the acquisition and operation of forests by counties, towns, villages, cities, or other legal subdivisions. A few states have enacted special

1- Brown, N.C. Community Forests, Their Place in the American Forestry Program, Jour.of For. Feb. 1941 p. 176.

laws pertaining specifically to the formation of community forests.

The legislature of the State of Massachusetts passed a law in 1913 which authorized towns and cities to establish forests. It was the first state to enact such a law.

In New York, laws passed in 1916 and succeeding years permitted the acquisition of land to be used for forestry purposes by counties, cities, towns, villages, school districts, and other political subdivisions. A law passed in 1929 provided that the State would pay up to $5,000 a year to a single county for reforestation purposes if the county spent an equal amount in the purchase and development of a forest or forest areas.

The State of Wisconsin passed what is known as the "Forest Crop Law" in 1927 to deal with the problem of large areas of tax-delinquent and cut-over lands. This law authorizes the State Department of Conservation to pay individual counties 10 cents per acre for each acre of county-owned forest crop land that is designated as county forest reserves. The law also provides that the State is to be reimbursed by a severance tax of 50 per cent on any timber cut. The purpose of this law is to make it possible for the counties to operate its forests under a management plan developed by technically trained foresters appointed by the State Department of Conservation.[1]

Michigan enacted the "Municipal or Community Forest Act"

1- Anon. Community Forests in the United States, U.S. Dept. of Agric. Forest Service Bulletin B-26 p.11.

in 1931 which provided for the establishment and maintenance of such forests in this state. (The full statement of this Public Act is included below)

11- Reasons for Community Forest Establishment.

Nelson C. Brown of the New York State College of Forestry sent out a questionaire to 29 state foresters asking for their viewpoints on the reasons for the present and future establishment of community forests in their respective states. There were 11 different reasons given altogether. The leading first reason was watershed protection. This was given for Delaware, Georgia, Maryland, Massachusetts, Minnesota, New York, Ohio, Oregon, Tennessee, and Vermont. The second reason, in order of importance, was growing timber crops for revenue. Recreation was given as a reason in 18 states; watershed protection was mentioned by 16; growing timber crops for revenue, 14; employment outlets especially for relief labor, 10; educational and demonstrational features, 8; general community welfare, aesthetics, etc., 8; putting idle land to productive use, 6; wildlife management, improvement, and refuges, 6; tax delinquency, 3; and windbreaks and use of poor farms, 1 each.[1]

12- Review of Community Forest Progress.

There were very few community forests established out - side of New England before 1900. About that time the idea had

1- Brown, N.C. Community Forests, Their Place in the American Forestry Program, Jour. of For. Feb. 1941 p. 175.

taken root and by 1910, through the efforts of various forestry leaders, it had been well publicized. Since that time progress has been fairly steady and rapid.

Reports show that in 1933 there were 860 community forests[1] in the United States. At that time 30 per cent of the number of community forests and 17 per cent of the total area were found in New England. Fifty-four per cent of the number and 60 per cent of the area were in the Middle Atlantic States, New York accounting for practically one-half of the total number and 36 per cent of the area. A survey conducted in 1938 showed that there were 1,500 community forests and about 3 million acres devoted to them. Approximately 146 million trees had been planted on them.[2]

A survey by Ernest Buhler of the United States Forest Service, made in 1940, indicated that 67 new community forests were established during 1939. These were found in 16 states and comprised a total of 10,875 acres. Wisconsin added no new community forests but increased its acreage in 15 existing forests by 70,069 acres, making a total of 1,885,000 acres devoted to community owned forests. A large part of these lands were acquired through tax delinquency.[3]

New York has the largest number of these forests. Since 1909 when the first community forest was established in this state there has been a steady increase of about 20 per year.

1- Tillotson, C.R., A National Plan for American Forestry, Sen. Doc. 12, Washington, D.C. 1933.
2- Opp. Cit. p. 177 Brown
3- Ibid.

There were 622 community forests in New York in 1939. Fourteen additional ones were established during 1940. The present total is 636 on which more than 70 million trees have been planted. The area making up these forests is about 70,000 acres.[1]

In Massachusetts Harris A. Reynolds, secretary of the Massachusetts Forest and Park Association, has been very active in the community forest movement. The state itself provides trees free of cost for planting on town forests and the state forester makes working plans and gives advice regarding the management of these areas. Of the 191 community forests in the state 102 are town forests, organized under the provisions of the 1913 act. The rest are watershed forests. The total area of these forests in the state is 169,800 acres.[2]

Pennsylvania reports 134 community forests with a total area of about 50,000 acres on which more than 5 million trees have been planted. Eight of these are town forests and the others are borough forests, forest parks, and municipal watershed forests. Several of the Pennsylvania communities have planted between 200,000 and 500,000 trees.[3]

From the Northeastern States the community forest idea has moved south and west. The form and purpose varies according to local needs and land problems. The largest venture of

1- Brown, N.C., Community Forests, Their Place in the American Forestry Program, Jour.of For. Feb. 1941 p. 177
2- Brown, N.C., Community Forests, Close to Home and Serving Local People. U.S. Dep't. of Agric. Forest Service Bull.p.3
3- Ibid p. 4.

this kind is that reported by Seattle, Wash. The school forests of Michigan and the county forests of Wisconsin are a phase of the movement. Large sums of money are also spent annually in forestry activities by Los Angeles, Ventura, Santa Barbara, and San Mateo Counties, California. Texas recently established five community forests and about 16,000 trees have been planted on them. They are also becoming popular in the Southeastern States.

It is evident that this phase of forestry is making progress steadily and is gradually becoming an important part of the Nation's forestry program.

Incomplete reports of the United States Forest Service show the following distribution of community forests in various states:[1]

Alabama	3	Maryland	4
Colorado	2	Massachusetts	191
Connecticut	19	Michigan[2]	235
Florida	1	Minnesota	6
Georgia	25	Missouri	5
Illinois	20	New Hampshire	102
Indiana	10	New Jersey	10
Iowa	4	New York	636
Kentucky	2	North Carolina	37
Lousiana	3	Ohio	25
Maine	26	Pennsylvania	134

1- Anon. Community Forests in the United States, U.S. Dep't of Agric. Forest Service Bulletin B-26 p.2
2- McIntire, G.S., Assistant State Forester, State of Michigan, correspondence

Rhode Island	5	Vermont	45
South Carolina	4	Virginia	4
Texas	9	Washington	3
Utah	4	Wisconsin	176
		Total	1650

13- Community Forests in Michigan.

a- The Municipal or Community Forest Act. The 56th legislature of the State of Michigan in the session of 1931 passed upon a Community Forest Act, the text of which is given here in full. Act 217, Public Acts, 1931.[1]

An act to provide for the establishment and maintenance of county, city, village, township, and school district forests; to provide for commissions to supervise such work; to provide for the sale of state lands for such purposes; and to provide a limitation on the expense of such work.

The people of the State of Michigan enact: Section 1. As used in this act:

"Municipality" shall mean any county, township, city, village, or school district.

"Legislative body" shall mean any board of supervisors, township board, city or village legislative body, or school district board.

Section 2. Any municipality may acquire by purchase, gift, or devise, or may provide lands already in its possession, and use such lands for forestry purposes, either within or without the territorial limits of such municipality, and may carry on forestry

1- Jotter, E.V., Starting a Community Forest, Mimeographed publication of School of Forestry and Conservation, University of Michigan, Ann Arbor, Michigan. p.4

on such lands. Any municipality may also receive and expend or hold in trust gifts of money or personalty for forestry purposes.

Section 3. The legislative body of any municipality desiring to proceed under this act may appoint a forestry commission for the municipality to consist of three members only one of whom shall be a member of the legislative body making such appointment. The members of such commission shall hold office for a term of four years and until their successors are appointed and have qualified, except that when first appointed one shall be appointed for a term of four years, one for a term of three years, and one for a term of two years. Any vacancy shall be filled by appointment by the legislative body at any regular session. The members of such commission shall serve without compensation.

Section 4. It shall be the duty of such commission to supervise and manage all lands of the municipality devoted to forestry and to provide for the performance of such labor therein by foresters and others as may be necessary for the proper care and maintenance of such lands as forest-producing areas, to make reasonable rules and regulations concerning such lands, and to expend such moneys as may be appropriated or received for such purposes.

Section 5. Every forestry commission created hereunder shall annually at a time to be designated by the legislative body make a report to such body showing the activities of the commission and embracing a detailed statement of its receipts and expenditures during the preceding year. The commission shall also file a copy of such report with the board of supervisors, in case it is not a county commission, and a copy with the department of conservation.

Section 6. The director of conservation with the approval of the conservation commission, the auditor general or other state officer having charge of state lands, is herby authorized to sell homestead, tax, swamp, or primary school lands to municipalities for forestry purposes, at such price as shall be fixed by said director with the approval of the conservation commission, auditor general or other state officer: Provided, That the said officers shall not sell for any such purpose any land in excess of the amount which may be necessary for any such municipality; provided further, that any land so sold shall be suitable for and used solely for the above purpose,

and when the same ceases to be used for such purpose, it shall revert to the State.

Section 7. It shall be the duty of municipal forestry commissions and the department of conservation to co-operate with each other in all matters pertaining to the establishment and maintenance of public forests. The department of conservation may inspect municipal forests as often as it deems necessary.

Section 8. The legislative body of any county, city, or village or the electors of any township or school district in which a forestry commission has been created may appropriate money to be used by said commission to carry out the purpose of this act: Provided, that where such legislative body desires to spend an amount in excess of one-tenth mill per dollar assessed valuation and/ or in excess of five thousand dollars in any one year for the purpose of this act, such sum shall not be appropriated unless the electors of the county, city, or village, shall agree thereto at any general or special election, by a three-fifths vote.

Section 9. A separate account of all revenue and expense of all funds appropriated and/ or invested to the forestry commission shall be kept by the financial officer of the municipality, and such funds may be expended upon the warrant of two members of the commission.

Section 10- Any income from forest lands shall be paid into the general fund of the municipality.

Approved May 28, 1931.

b- Present development. According to information received from the Michigan Conservation Department there are approximately 235 community forests in the State with a total acreage of about 13,000 acres. Of this number, 105 are owned by schools. There were 20 new community forests established in Michigan during the year 1940.

The community forest movement was originally most active in the Upper Peninsula, but has now spread to

the Lower Peninsula. Most of the community forests are located north of township line 16 where state lands have been made available for such purposes. About 215 of the present number of community forests have been established during the last decade. A report of 1931 by E.V. Jotter states that there were only 20 such forests in existence at that time with an aggregate area of about 4,000 acres.[1]

c- Reasons for the establishment of these forests. It is the general opinion of the officials of the Department of Conservation that one of the main benefits to be derived from this movement is educational. Consequently great emphasis is placed on the school forests and about one half of the community forests of the State are owned by schools. The students do all of the work and become acquainted with forestry practices in the management of forest properties. It is obvious that other benefits are involved but this is the reason that is considered most important by this department at present.

d- Present and future possibilities.

(1) Available land. In this state all tax reverted lands are under the jurisdiction of the Department of Conservation. As a result of this provision there are now nearly five

1- Jotter, E.V. Starting a Community Forest, Publication of School of Forestry and Conservation, University of Michigan, Ann Arbor, Michigan p.3

million acres of land located in the Upper Peninsula and the northern part of the Lower Peninsula which are under the jurisdiction of this department.[1] Much of this land is already located in conservation project areas, such as state forests, public hunting grounds, etc., and the balance is scattered throughout the State. Any of these lands that are not already being reserved for public use are available for community forest purposes and the Department of Conservation, under authority of Act 217, Public Acts of 1931, can convey to governmental units, including schools, lands for community forest purposes. It is estimated that there are more than 3 million acres in Michigan at the present time for which there is no definite use-plan. Thousands of acres are being added to this type annually. Any of this land is available for forestry purposes and much of it is only suited for that purpose.

(2) State cooperation with communities. For the past 10 years, since the passing of the Municipal or Community Forest Act, it has been the policy of the Department of Conservation

1- Millar, C.E. , Lands Division, Michigan Department of Conservation, Lansing, Michigan, correspondence.

to supply planting stock free of charge when the trees are to be planted on land, title to which is vested in a public agency. The maximum amount which may be obtained by any one agency during a given year usually depends uponthe demands and the amount of stock available. Ordinarily, the amount does not exceed 5,000 trees per agency per planting season, and may be considerably less than that. This policy has been adopted to stimulate the community forest movement.[1]

The State employs two trained foresters who devote a large portion of their time to the promotion of community forests. Part of their work is to assist local committees in making management plans for their community forests. This assures a higher percentage of successful units.

Cooperation with regard to the supplying of land for community forest purposes has been discussed above.

(3) Possible uses.

a). Recreational use. The northern part of the State does not lack forests that can be used for recreation.

1- McIntire, G.S., Assistant State Forester, State of Michigan, Lansing, Michigan, correspondence 1940.

This, however, is not the case in the southern part of the Lower Peninsula. Here community forests have great possibilities as picnic areas and public play grounds. The people of Detroit and near-by cities travel great distances to reach forest areas that are not overcrowded with people on Sundays and holidays. A system of community forests could do much to improve recreational facilities for our metropolitan sections.

b). Demonstration of forest practises. Many school forests are already being operated for this purpose but most of them are located in the northern part of the State. Such projects, if located in the more densely populated southern sections, can be of even greater value because more people would benefit from them. They also serve as outdoor laboratories for nature study.

c). Wildlife refuges and sanctuaries. Much of the State's tax-reverted lands are already in this type of

project. They also are located in the northern counties. It has been found, in the Eastern States, that the game population may be increased up to 40 per cent in five years by setting aside forest areas and closing them to hunting. Hunting is a popular sport in Michigan and license fees yield a sizable sum to the Conservation Department annually. Community forests can improve hunting conditions and so may indirectly, as well as directly through other means, yield financial profits.

d). Other uses. Community forests can serve to beautify the roadsides and general landscape. The northern counties have innumerable roadside areas that are denuded and dotted with burned stumps and snags. Forest plantings can do much to improve the appearance of these lands.

Watershed protection is of major importance in some inland cities. The community forest can serve very well to protect watershed areas and at the

same time may be used to grow timber and serve as a recreational outlet.

These forests may serve as employment outlets in times of emergency relief. This has been fully discussed earlier in this paper. The discussion applies very well to conditions in Michigan.

(4) Costs and Yields. The initial capital expenditure for the establishment of community forests in this State is very low. In nearly every case the land has been deeded to the community by the Conservation Department and in many instances planting stock has been supplied free of charge. The cost of labor has been nil in the case of school forests and very low on the others because relief and C.C.C. help has been used to a great extent.

Care and protection costs vary with the location of the forest. Community forest properties are exempt from taxes according to the Municipal Forest Act. Thinnings in young stands may be made at an expense but this expense is offset by later thinnings which will be made at a profit. Yields are given here

for the most common species used in Michigan community forests. Figures are taken from yield tables compiled at the University of Minnesota Agricultural Experiment Station.[1] The figures apply to the Lake States in general. These tables indicate yields for "normal" stands. This condition is common in planted stands but is seldom the case in natural stands. The tables can be used directly for planted stands. In using them for natural stands the percentage of normality must be determined and this percentage may be applied to the yields indicated for each age class. Obviously, current wood products prices will determine the gross income from the property. The tables are included merely to give some idea of what may be expected per acre of forest property. They plainly indicate that a community forest can be a substantial source of revenue to the community.

(5) Need for forest development. Michigan forests have been exploited to such an extent that we have only a few acres of virgin pine forest remaining. The virgin hardwood forests are also rapidly disappearing. Some of the cut-over hard-

1- Brown, R.M., Gevorkiantz, S.R., Volume, Yield, and Stand Tables for Tree Species in the Lake States, University of Minnesota Agricultural Experiment Station, Technical Bulletin 39, pp. 180-208.

TABLE I

NORMAL YIELD TABLE

Fully-stocked, Pure, Even-aged Stands

Second-growth White Pine

(Pinus strobus)
-1

Wisconsin

Age	Yield per acre in board feet Scribner Decimal C Log Rule, 8 inches and over		
	Excellent site	Medium site	poor site
40	8100	4000	1250
50	22000	10700	4500
60	37500	20500	9100
70		31300	14500
80		40900	20500
90		48500	26500
100		55000	32000
110		60500	36500
120		65000	40000

1- Also applicable to stands in Minnesota and Michigan.
Volume in cubic feet without bark
Stump height; top diameter 6 inches inside bark.

TABLE II

NORMAL YIELD TABLE

Fully-stocked, Pure, Even-aged Stands

Average site

Second-growth Norway Pine

(Pinus resinosa)

Age years	Yield per acre in board feet Scribner Decimal C Log Rule, 8 inches and over
40	5000
50	11000
60	18000
70	25000
80	31000
90	36000
100	40000

TABLE III

NORMAL YIELD TABLE

Fully-stocked, Pure, Even-aged Stands

Jack Pine

(Pinus banksiana)

Yield in Board Feet

6 inches and over

Age years	Site Quality					
	Good		Medium		Poor	
	Lumber[1] per acre board feet	Additional[2] pulp wood per acre cords	Lumber per acre board feet	Additional pulp wood per acre cords	Lumber per acre board feet	Additional pulp wood per acre cords
20	-----	10	-----	5	-----	1
30	1000	22	-----	17	-----	8
40	5500	20	1000	22	-----	16
50	11,500	14	4500	19	500	19
60	15,500	10	7500	16	2000	18
70	18000	9	10500	12	3500	16
80	20000	9	12000	10	5000	14

1- Stump height, 1 foot; top diameter, 6 inches inside bark.
2- Pulpwood from trees 4 to 6 inches in diameter and from tops above 6 inches top diameter.

woods lands have grown back to such an extent that they are yielding a second cut. This condition does not exist with respect to the pine lands. The fire hazard on these areas has been much greater than on hardwoods lands and they have been burned over repeatedly so reproduction is almost entirely absent. If the soil is to produce pines of merchantable size once more they will have to be planted and protected. Much of this work is being done by the United States Forest Service on the national forests but this will take care of only a small part of the denuded pine lands of the State. Community forests can very well be used to help in restoring the white pine and Norway pine to these denuded areas.

IV-SUMMARY AND CONCLUSIONS

1- The community forest idea originated in Europe where they have been very successful and have constituted a very important part of the European forestry program for centuries.

2- The first community forest to be established in the United States was at Newington, New Hampshire. From this nucleus the movement has spread so at the present time there are about 1650 community forests and about 4 million acres are devoted to them. Approximately 180 million trees have been planted on these areas. This progress has been made without any national organization or federal financial assistance. With favorable support and adequate funds they can be made a very important part of the public ownership program of American Forestry.

3- In general, these forests are formed from any relatively low value land that is suitable for growing trees. these lands are acquired and operated by a variety of ownership types varying from large cities to Girl Scout or similar groups. Because of the many types of owners, the benefits are realized by a greater variety and number of people which increases the real value of these projects.

4- Uses and reasons for establishing these forests vary with the region in which they are located. Surveys have re-

vealed that the most common purposes are watershed protection, timber growth, school demonstration purposes and recreation and employment purposes. Community forests have great possibilities for all of these uses.

5- Michigan, Wisconsin, Massachusetts, and New York have enacted special laws pertaining to community forest development. These laws provide for state cooperation with municipalities and organizations in building community forests and have done much to stimulate the movement in these states. More states should follow the example set by these leaders in the field.

6- Opportunities for the development of community forests are much better in some sections than in others. The movement was initiated in the Northeast and has made the most rapid progress there but there are ample opportunities for its expansion and development in many other parts of the United States.

7- Besides the many intangible values that community forests offer, they have been found to be a sound financial investment and have yielded substantial returns in a number of cases where forested areas have been acquired . The planting of denuded areas is necessarily a long time investment and does not interest the average individual, but towns and cities can afford to wait for the crop to grow because of the steady, long time benefits which a forest will yield. Our communities, therefore, are especially suited to take an act-

ive part in the Nation's forestry program.

8- Michigan has made a good beginning in the development of community forests, especially the school forest type. The movement has been most active in the northern part of the State but has now spread to the southern sections. Community forests offer one very practical method of utilizing a part of the State's tax-reverted lands which now make up an area of nearly five million acres.

9- The Municipal Forest Act provides for State cooperation with organizations and municipalities in the establish - ment of these forests. This act makes it very easy for any interested community to acquire land and planting stock for this purpose. Some communities have taken advantage of this provision but the number is relatively small in comparison with the number that could be enjoying the benefits of a community owned forest.

10- The most practical uses of community forests in Michigan are for recreational outlets, wildlife sanctuaries, demonstration forests, for scenic improvement of the landscape, and for timber growing purposes. There is a special need for the recreational type in the southern, more densely populated areas. All types can be a real asset in any part of the State and should be promoted.

11- The need for forest development over the whole United States in general has been emphasized for some time and is very evident. The community can play an important role in

supplying this need and in the future, community forests may play as important a part in the life of our people as they have for hundreds of years in the lives of the people of Europe.

V-COMMUNITY FOREST PLAN FOR DEXTER, MICHIGAN

A- General Description of Tract

1- Location.

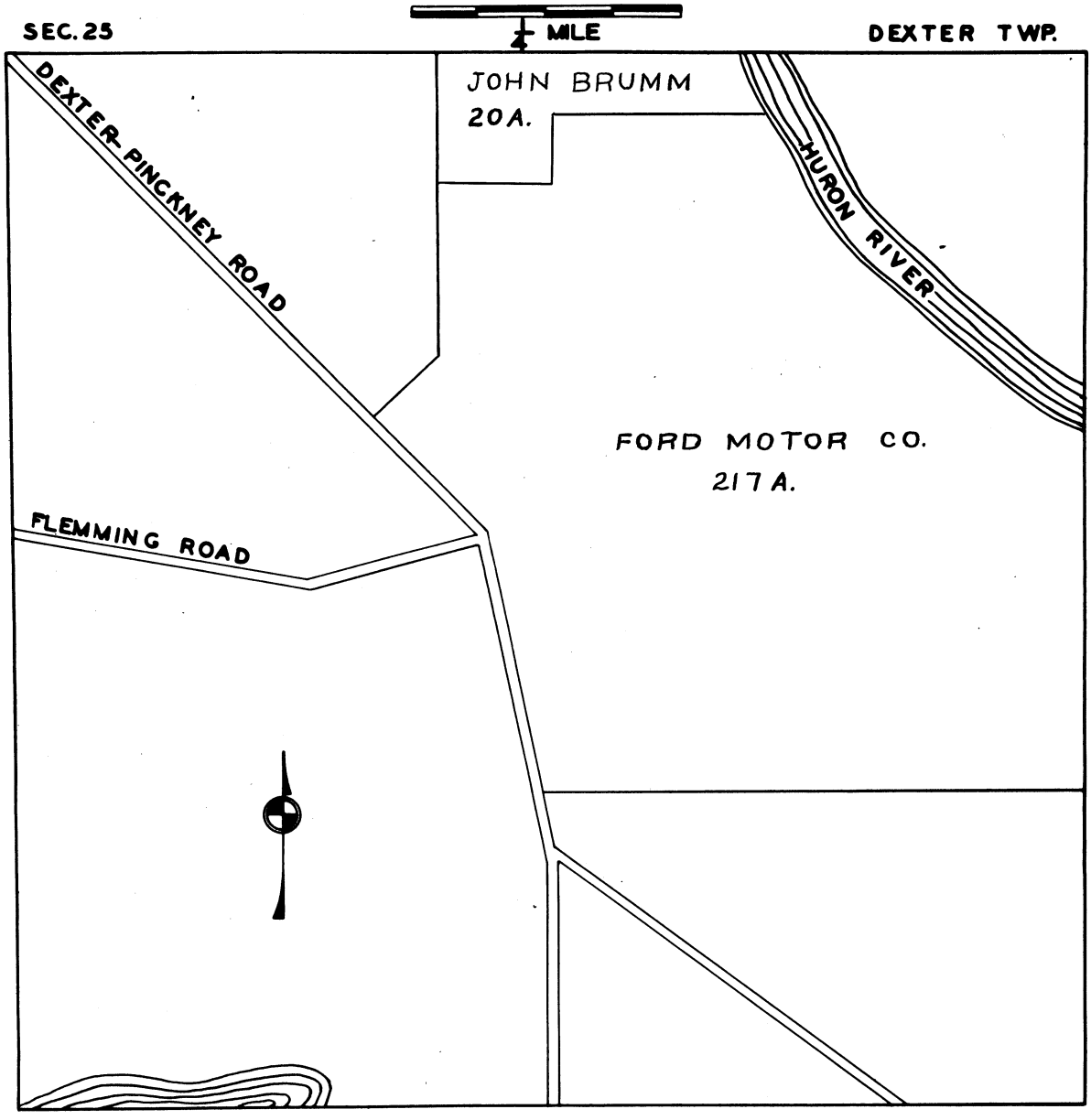
The area to which this plan refers is located approximately two miles northwest of the city of Dexter, Michigan along the Huron River. It is in Section 25 of Township 1 South, Range 4 East of the Michigan Prime Meridian. This is Dexter Township of Washtenaw County. The tract borders on the Dexter- Pinckney Road at the point where the Flemming Road joins it. It lies on the east side of the Dexter-Pinckney Road at this point and extends to the Huron River.

2- Area and Boundaries.

The area of this tract is 237 acres. It is bounded on the north by the section line between sections 24 and 25; on the east by the Huron River and the township line between Dexter and Webster townships; on the south by a line running due east and west a distance of 12 rods north of the dividing line between the north and south halves of the S.E. $\frac{1}{4}$ of Section 25; on the west by the Dexter-Pinckney Road and the fence which marks the east boundary of the property of John Brumm. (See map)

OWNERSHIP

DEXTER COMMUNITY FOREST PLAN



3- Status of ownership.

This tract of land is owned by two parties. The largest owner is the Ford Motor Company which owns 217 acres as shown on the land ownership map. Professor John Brumm of Ann Arbor owns 20 acres at the north end of the tract. The Ford Motor Company has acquired this land to obtain flowage rights on the river prior to the construction of a power dam. The part owned by Professor Brumm is used for pasture by neighboring farmers.

4- Topography and drainage.

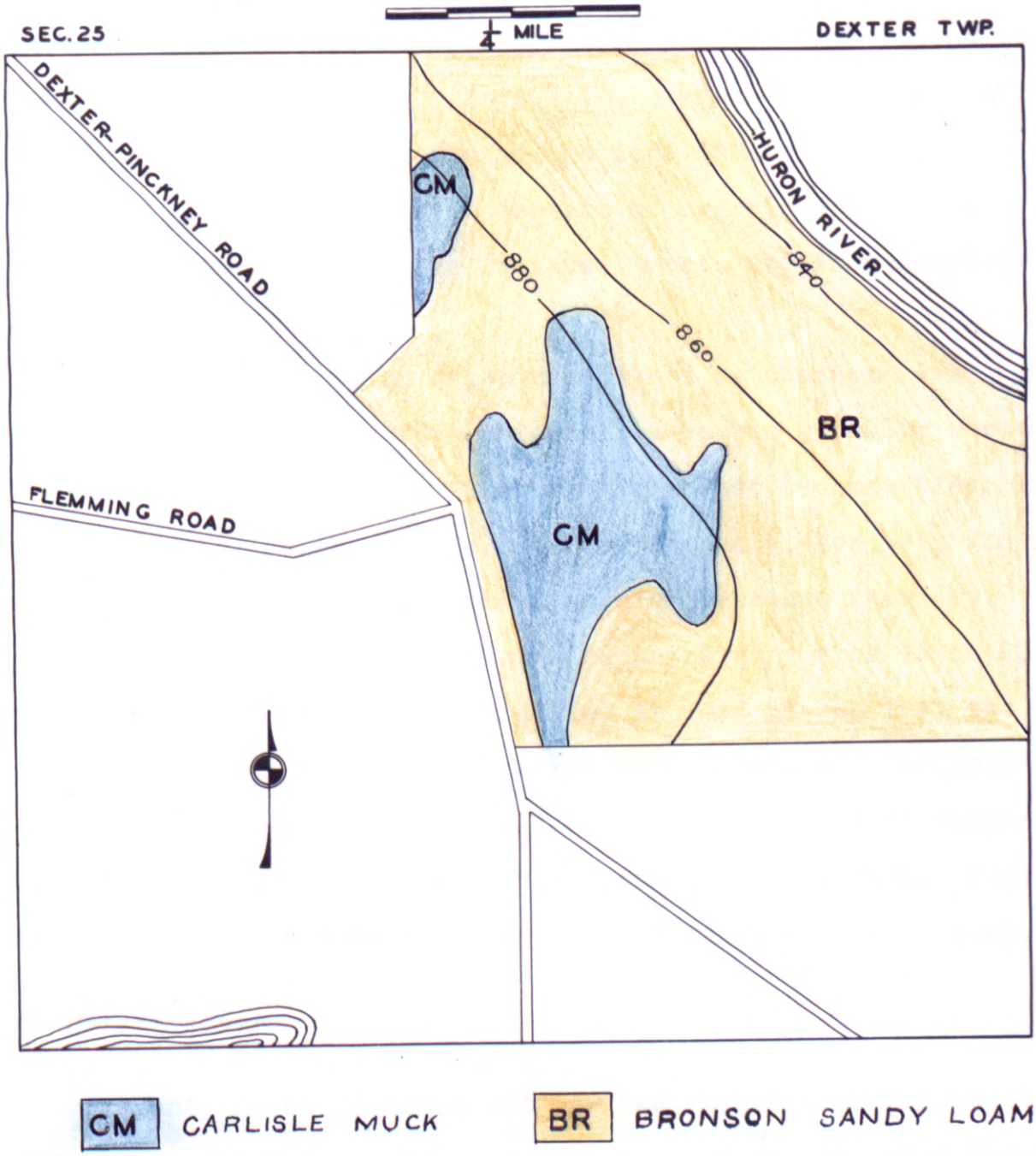
The area in general is level. It is made up of about 95 per cent level land and the remaining 5 per cent is gentle slope of 5 to 15 per cent. These slopes occur along the river banks. The drainage of the tract is toward the Huron River. There are no definite drainage channels or streams on the area but the land slopes gradually toward the river. The tract is very well drained except for a few small scattered spots that are marshy and have a little standing water. Boulders and rocks are numerous. The fence rows of the pastured sections are lined with piles of stone of all sizes. The forested part has numerous small outcroppings over the entire area.

5- Soil.

Carlisle muck and Bronson sandy loam constitute the soil types found on this tract of land. The location of these soil

SOIL AND TOPOGRAPHY

DEXTER COMMUNITY FOREST PLAN



types is indicated on the soil map. (See soil map)

Bronson sandy loam is a soil which is light in texture, sandy and is underlain bypure sand and gravel deposits. A floor of massive impervious clay is present in some places at a depth of less than 10 feet. The surface relief is favorable for general farming, and the land is easily tilled. This soil is intermediate in content of organic matter, is commonly medium acid in the surface layers, and is moderately productive.

Carlisle muck is an organic soil and is characterized by dark-brown or black surface material, a coarse granular structure, and a loamy texture. The organic matter becomes finer in texture at the depth of a few inches, is pasty when wet, and is hard and harny, breaking with an angular fracture when dry. The parent organic material, at a depth ranging from 12 to 20 inches, has been so greatly modified in most places that the original vegetal composition cannot be determined. Carlisle muck is nearly neutral or alkaline in reaction. It is comparatively rich in lime and phosphorus but poor in potash. Scattered elm, ash, and maple occupy this soil type on this area.[1]

6- Forest cover.

Seventy acres of the tract now has forest growth upon it. (See cover type map) It is a very healthy and vigorous forest. The dominant species and corresponding approximate percentages

1- Veatch, J.O., Soil Survey of Washtenaw County, Michigan, U.S. Dep't. of Agric. Bulletin, Series 1930, Number 21.

of each are as follows:

Hard Maple --- Acer sacharrum-------	25%
Red Oak --- Quercus borealis, Maxima-	10%
Basswood --- Tilia americana -------	10%
White Oak --- Quercus alba ---------	8%
American Elm --- Ulmus americana ---	5%
White Ash --- Fraxinus americana ---	12%
Total-	70%

The remaining 30 per cent of the trees on the area consist of red maple (Acer rubrum), ironwood (Ostrya virginiana), shagbark hickory (Carya ovata), black oak (Quercus velutina), and black cherry (Prunus serotina). All of the trees mentioned occur in mixture and are scattered uniformly over the tract.

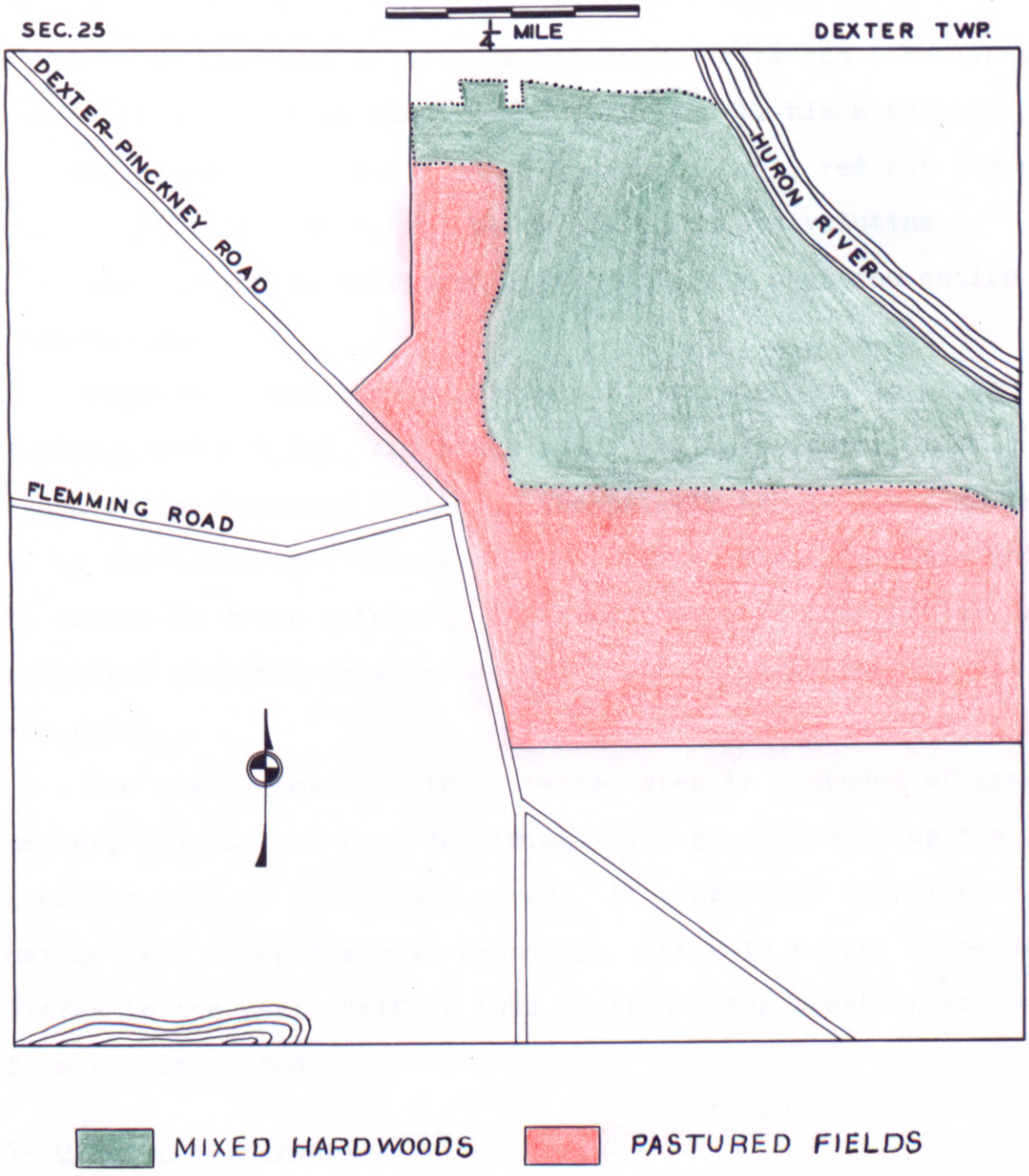
The average spacing of trees above 4 inches D.B.H. is about 15 feet. The diameter of the principal species above 4 inches D.B.H. are arranged as follows:

Small pole class --- 4 in. to 8 in. D.B.H. ---	50%
Large pole class --- 8 in. to 12 in. D.B.H. --	35%
Standards --- above 12 in. D.B.H. ----------	15%

The average diameter of all dominant trees is about 10 inches D.B.H.

The reproduction is made up mainly of trees of the sapling size. There are few shoots and seedlings. The principal species represented are hard maple (Acer sacharrum),

COVER TYPES
DEXTER COMMUNITY FOREST PLAN



blue beech (Carpinus caroliniana), and ironwood (Ostrya virginiana). These three species make up about 60 per cent of the reproduction. Other species that occur in smaller numbers are basswood (Tilia americana), white ash (Fraxinus americana), American elm (Ulmus americana), black cherry (Prunus serotina), white oak (Quercus alba), red oak (Quercus borealis, maxima), and black oak (Quercus velutina). The reproduction is scattered quite uniformly over the entire forested part.

Dogwood, choke cherry, Crataegus, prickly ash, low-bush juniper, witch hazel, and black raspberry make up the underbrush on the forested section. The prickly ash is found mainly in the south-east corner of the forested plot. At this point it occurs in dense patches. The remainder of these species are scattered over the area and do not occur in large numbers at any point.

The ground cover on the forested area is composed of grasses mosses, sedges, and some Vaccinium. The grasses make up the greatest part of the ground cover. It approaches the high, marshy type along the west boundary. There is a very heavy leaf litter in the north half of this section which prevents grasses from forming a sod.

7- Other cover types.

The cover outside of the forested section is made up entirely of grassy pastured fields except for a small grain-field

in the south-east corner of the area.

8- Adaptability.

The area is easily reached by way of the Dexter-Pinckney Road which is a much traveled highway running north-west from Dexter. The Flemming Road joins the Dexter-Pinckney Road at this point so it can be reached by that route from the west.

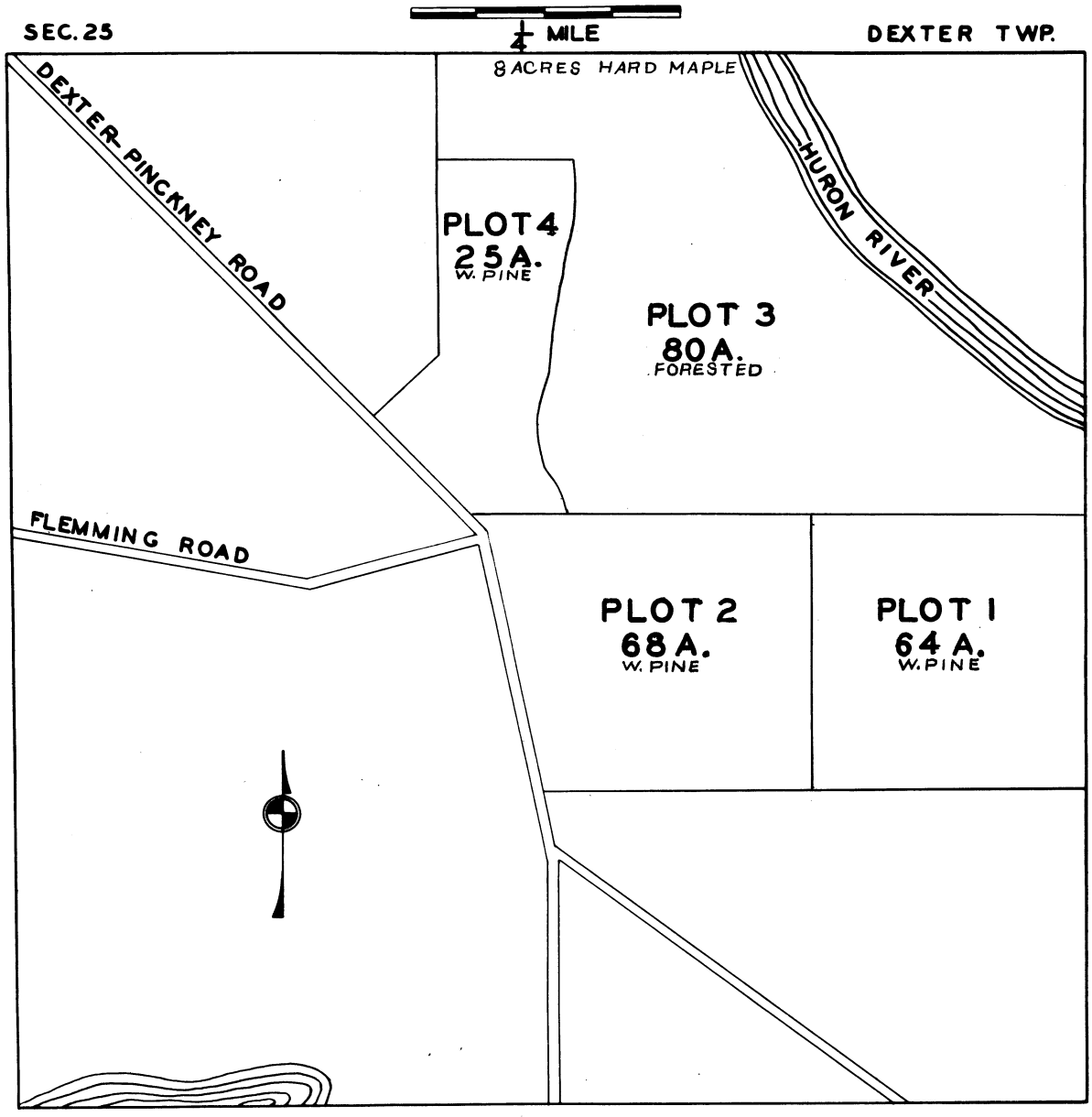
The two soil types found on this area are suitable for good forest growth. This is shown by the fact that a portion of the tract now supports a vigorous growth of hardwood timber species and the cleared sections are bordered by rows of hardwood trees that have attained a diameter of as high as 30 inches at the base. Plantings in other areas in this region have shown that these soil types are also suitable for growing good crops of coniferous trees.

This area is well suited for recreational use. The Huron River and the wooded section along its banks makes it an ideal place for picnicking and hiking. The river at this point is about 150 feet wide and is excellent for canoeing. The banks are lined with large hardwood trees which make the river views very attractive. The clearing and woods at the north end provides an excellent spot for a parking and picnic area. Road construction is easy on this type of soil and only a shallow well would be needed to supply water because of its proximity to the Huron River. The woods contains a large number of dead trees which could be used for fuel for the fire-places.

There is evidence to indicate that the tract has been

PLANTING

DEXTER COMMUNITY FOREST PLAN



used by a few people for picnic purposes and also for hiking. There are several used paths and a few spots where fires have been built along the river. Judging from the intensive use of park areas in this locality it is reasonable to assume that this tract, if developed, would serve as an outdoor recreational outlet for a large number of people from the surrounding communities.

9- Timber utilization.

Very little cutting has been done on the area during the last few years. In the years 1917-18-19 there was organized cutting by the neighboring farmers who were given permission to cut wood. At that time the inferior species and crooked and otherwise undesirable trees were removed. In recent years some black walnut, windfalls, and dead trees have been removed and used for relief purposes so the present stand is fairly clean and consists mainly of valuable species from the timber-growing standpoint. Most of the trees have very good form.

10- Wildlife

Songbirds are very numerous on this tract and there are also some Bob White Quail, and Chinese Ring-neck Pheasant. A small flock of ducks make their home on the Huron River at this point. Blue heron were also sighted on the river. Squirrels and chipmunks are numerous in the wooded parts.

B- Proposed Land Management Plan for the Area

1- Land acquisition.

It is proposed that an effort be made to acquire the portion of this tract that is owned by the Ford Motor Company (217 acres) through a gift to the Dexter community by the company. Tax rolls indicate that a good average value per acre for the land of this tract, both clear and forested, is $35 per acre. If it cannot be acquired in this manner this part may be purchased outright along with the other 20 acres owned by Mr. Brumm. The total cost at $35 per acre would then be $8,295. If the Ford property is received as a gift and only the 20 acres purchased the cost would be $700.

It is suggested that funds raised by the community during the Dexter Centennial Celebration during the summer of 1941 should be placed in a community forest fund to be used toward the establishment of this tract as a community forest to serve the people of Dexter.

2- Description and initial plan for Plot 1 (See plot map)

The area of plot 1 is 64 acres and the site medium for pine. It is cleared land and was all under cultivation at one time. In recent years all except a field of six acres in the south-east corner has been used for pasture.

The plan for this plot is to plant it to white pine (Pinus strobus) using 2-2 stock and a spacing of six feet. A truck road is proposed along the boundary between Plots 1 and 2 with

a turn-around at the south end. This road will join the main road running along the south boundary of Plot 3. Planting in plowed furrows with planting bar is the proposed method.

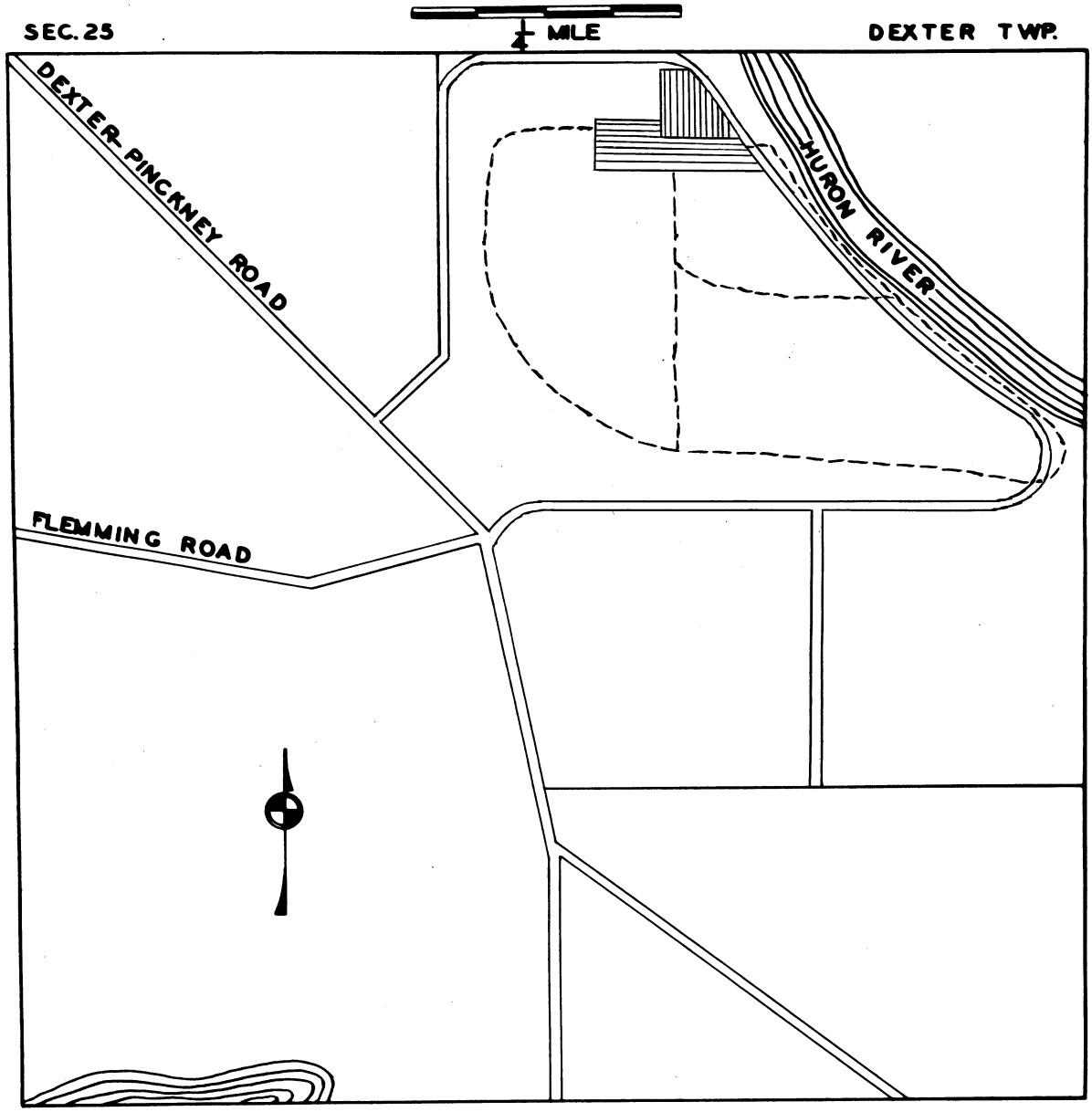
3- Description and initial plan for Plot 2.

The area of Plot 2 is 68 acres and the site is medium. It is suggested that this plot be managed on the same basis as Plot 1. The proposed truck road will serve both plots. Size of planting stock and method of planting will be the same as for Plotl.

4- Plot 3.

This plot takes in all of the forested section of the tract and the small cleared area along the north boundary. The area of this plot is 80 acres. All except 10 acres of this is forested to the extent described above in this paper. It is very well suited for recreational use and this plan calls for the development of this section for that purpose. A scenic drive is proposed from the Dexter-Pinckney Road extending along the south boundary of Plot 3 to the Huron River and north along the river as shown on the recreation map (See recreation map). A parking area and picnic grounds is planned at the north end along the river. The woods is clean and very attractive along the route chosen and it affords excellent opportunity for picnicking facilities. Several drive- off places are proposed along the road where cars may stop and inconspicuous log

REGREATIONAL DEVELOPMENT
DEXTER COMMUNITY FOREST PLAN



parking rails will be necessary on the parking area. A drilled well, located so as to be easily accessible from all parts of the picnic area, is proposed. The well must be located away from any contamination. A men's and a women's toilet of the pit type will be located near the picnic area. It is estimated that 24 picnic tables will be adequate for the near future and 12 stone fire-places placed so each fire-place will accomodate two tables. Stones for the fire-places can be secured from the large piles of stones along the fences in the north end of the tract. Twelve galvanized waste cans, conveniently located, will be adequate. Wood for use on the picnic area can be taken from the adjoining woods. There are numerous dead trees which can be used for this purpose. A log shelter, dimensions 20 by 40 feet, is also proposed for the picnic area. This will be centrally located and have a double stone fire-place. Estimated cost of construction is about $800.

Trails for hiking are shown on the accompanying map. The trails are planned so that persons using them will not have to return over the same trail that they used when going away from the picnic area.

All underbrush and the smallest trees will have to be removed from the part to be used for picnicking. The heavy leaf litter will also be raked and burned so that grass will come in and form a sod.

The proposed road extends west along the north boundary

and then turns south and follows the west boundary back to the Dexter-Pinckney Road as shown on the Recreational Development Map. The plan is to make this scenic drive a one-way drive and two cars wide with complete gravel surfacing.

It is proposed that the eight acre clearing west of the parking area along the road leading from the picnic grounds be planted with hard maple (Acer sacharrum) 2-2 stock with 12 foot spacing.

Grazing must be prohibited on all parts of this community forest. Hunting should also be prohibited so as to increase the game population on the forest.

5- Plot 4.

The area of this plot is about 25 acres and the species suggested for planting is again northern white pine (Pinus strobus) with six foot spacing as on the other plots where pine is used.

6- Estimated costs of establishment and maintenance of Dexter Community Forest.

a- Land acquisition. It has been suggested that an effort be made to acquire the Ford Motor Company property as a gift to the city of Dexter. If this attempt is successful the total cost for land acquisition will involve only the 20 acres owned by Mr. Brumm. The cost of this land will be $700. If the entire 237

acres is purchased the cost will be $8,295.

b- Planting cost. It is suggested that all planting should be done by the school children of Dexter with competent, close supervision by teachers and city officials who are well acquainted with this type of work. Planting stock, where white pine is planted, will amount to $5 per acre and furrowing with tractor and plow can be done for $2 per acre. Total costs per acre will amount to $7. The total acreage to be planted in pine is 157 acres. At a cost of $7 per acre this will amount to $1099. It is assumed that city officials who supervise the planting operation will donate their services. The eight acres of land planted with hard maple will cost approximately $24, allowing $3 per acre for stock. Scalping spots is suggested. Total planting cost for entire project then amounts to $1123.

c- Road construction. It is estimated that the main road can be constructed at a cost of $1,000 per mile. Approximate length of the main road is two miles so cost will be about $2,000 including gravel for surfacing. No grading or surfacing will be necessary on the truck road between Plots 1 and 2.

d- Picnic area construction cost. The cost of making adequate parking space with log rails and gravel surfac-

ing is estimated at $500. The cost of a well with pump will be about $150. Other costs as follows:

Two toilets at $100 each	$200.00
Twenty-four picnic tables at $12 each	288.00
Twelve stone fire-places at $20 each	240.00
Twelve waste cans at $3 each	36.00
Log shelter	800.00
Approximate initial cost	$2214.00

e- Trail construction cost. Proposed trails are shown on the recreation map. Total length of these trails is estimated to be about two miles. Construction of trails will be very easy and total cost is estimated to be about $20.

f- Summary of establishment costs.

Land acquisition (entire purchase)	$8,295.00
Land acquisition (Ford gift)	700.00
Planting cost	1123.00
Road cost	2000.00
Picnic area construction	2214.00
Trail construction	20.00
Approximate total cost under direct purchase plan	$13,652.00
Approximate total cost under gift plan	$6,057.00

g- Maintenance costs. Average annual expenditure for the

maintenance of roads is estimated to be approximately $100. Picnic grounds clean-up can be made by the same crew that performs that duty on the present Dexter park area. This will be necessary once per week during the picnic season. Estimated annual expense of clean-up is $50. The part time services of two men will be necessary to cut out all dead trees from the forested section and provide wood for the picnic grounds. Estimated annual expense of this activity is approximately $80.

Thinnings at intervals of 10 years are proposed for the planted pine stands. It is estimated that over the proposed rotational period of 80 years the revenue produced by merchantable thinnings material will cover the expense of all thinnings made during the rotation.

It will be necessary to employ one man to be present on the picnic grounds on Sundays and holidays during the season of use. It shall be his duty to patrol trails when the fire hazard is high and see that all fires are extinguished and prevent any malicious use of this community forest. Estimated annual expense of this activity is $100.

Summary of approximate annual maintenance expenses:

Roads	$100.00
Clean-up of picnic area	50.00
Wood-cutting	80.00
Patrol	100.00
Total	$330.00

7- Estimated production of forest.

a- Pine plantation. Systematic thinnings will be carried on under the direction of a forester in such a manner as to bring about an all-age stand in the pines over a period of 80 years. It is estimated that trees that are 80 years old will have an average diameter of 15 inches D.B.H.

Normal yield tables[1] for this region indicate that there would be a yield of 40,900 board feet per acre at 80 years for an average stand. If proper thinning is carried on in this plantation there will be 8 age classes on each acre and, theoretically, each will occupy 1/8 of each acre. The oldest age class will be 80 years old and it is estimated that when it is cut it will yield 1/8 of 40,900 or about 5000 board feet. This amount will be cut from 15.7 acres each year. The cut will be taken from the oldest age class over 1/10 of the pine plantation each year. Then 15.7 acres will be cut each year. The annual cut will be 15.7 times 5000 or 78,500 board feet and this annual cut will continue forever.

The value of this cut based upon 1938 log prices is as follows:

1- Brown, R.M. and Gevorkintz, S.R. Volume, Yield, and Stand Tables for Tree Species in the Lake States. University of Minnesota Agric. Exp. Sta. Bulletin 39, 1934, p. 204.

Price per thousand board feet of white pine logs [-1]	$22.00
Cost of felling, bucking, skidding, and decking [-2]	5.00
Net value per thousand	$17.00

Value of annual cut ----------$17x78.5M

or $1334.

The pine stand will yield an annual net income of $1334 beginning in 80 years and continuing for ever.

b- Forested section. A plan of selective cutting is proposed for this part of the community forest. Growth is estimated to be about 200 board feet per acre per year and diameter growth about 1.5 inches over a 10 year period. At the present time 15 per cent of the dominants are over 12 inches D.B.H. Only dead and poorly formed trees and inferior species shall be cut for the first 20 years. At the end of 20 years it is estimated that systematic cutting may begin on a 10 year cutting cycle and cuts equivalent to growth may be made. This type of cutting will not interfere with the use of the area for recreational purposes. The forested part can be divided into 10 lots of 7 acres each. One lot will be selectively cut each year and the

1- Steer, Henry B., Stumpage and Log Prices for 1938, U.S. Dep't. of Agric. Statistical Bulletin No. 71 p. 13.
2- Murray, Frank, Interview, 1941.

cut will be equal to 7 x 200 b.f. x 10 years or 14,000 board feet. It is suggested that marking of the timber for cutting may be done by forestry students of the University of Michigan with the guidance of their instructors. Cutting may be done on the picnic grounds but care should be taken to maintain adequate shade and the scenic aspects of the grounds, the river banks and along the road.

An annual cut of 14,000 board feet of this quality of timber has a net value of $140 at the current price base for logs of these species in this locality.

After 100 years cutting will begin on the 8 acres of planted hard maple. This will increase the annual cut by 1600 board feet per year. The annual cut will then be 15,600 board feet and the net annual income raised to $156.

All slash from cutting operations will be piled and burned.

8- Summary of expenses and incomes.

If the Ford property can be acquired by gift the estimated immediate expenditure for the establishment of this community forest will be approximately $6,060. If the entire property is purchased outright the expenses will be about $13,650. There will be no monetary returns for the first 20 years. Annual expenses will be approximately $330. When 20 years have

passed the hardwood forest will begin to yield an income of $140 per year. This will be applied toward expenses so the real cash outlay will then be $190 per year until the 60 th year when it it estimated that the thinnings from the pine stands will yield a net annual income that will be sufficient to defray this $190 annual expense. The forest will then be self sustaining. In the 80 th year cuttings will begin in the pine stand and it will add an annual income of $1334. The net annual income from the entire forest after deducting the $330. annual maintenance expenses will be $1144. The forest will then produce a net annual income of $1144 until the 100 th year when cutting will begin on the 8 acre hard maple lot. This lot will yield an additional $16 per year and the income from the property will then be $1160 per year. This condition will continue forever.

9- Jurisdiction over community forest.

It is suggested that a forestry commission be appointed by the city council of Dexter. The nature and duties of this commission shall be as prescribed by the Michigan Community Forest Act 217, Public Acts, 1931. (See page 37). All matters pertaining to the Dexter Community Forest shall be handled by this commission.

C- Summary of Proposals.

1- This community forest shall be established mainly for

the use of the people of Dexter but will be open to all visitors.

2- It is proposed that the entire plan shall be put into effect in one year rather than in steps in different years.

3- Recreational use shall be confined to the area designated for that purpose and shall be given priority on that section.

4- Grazing shall not be permitted on this community forest area.

5- In cutting the timber on the recreation area, care shall be exercised to maintain the scenic aspects of the picnic grounds and auto-traveled sections.

6- All cutting of timber for logs and thinning material shall be done under the direction of a technical forester.

7- The main management committee for this project shall be the forestry commission appointed by the Dexter city council.

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VII- ACKNOWLEDGEMENTS

The writer wishes to acknowledge with appreciation the numerous helpful suggestions that have been offered by various members of the faculty of the School of Forestry, especially Professor Shirley Allen under whose guidance this paper has been prepared. Officers of the Michigan Department of Conservation have also been helpful as well as various officials of the United States Forest Service. Officers of the Washtenaw County Treasurers office have furnished information with regard to land ownership of the community forest area. The faithful work of the typist has also been an item of major importance. To all of these grateful acknowledgement is made.