of soil too poor for farming. On such soil timber growth will always be the best crop.

For the purpose of this study ten counties considered typical of the northern part of the state were selected for detailed study. These were Bayfield, Douglas, Florence, Forest, Iron, Marinette, Price, Rusk, Sawyer, and Vilas counties. While all the information possible was collected in the other counties of the state, the principal work was confined to these ten counties.

**GENERAL DESCRIPTION.**

A large portion of the land in every one of these counties is agricultural in character, and in time will doubtless be placed under cultivation. The fact that this report calls attention to the existence of non-agricultural lands in a county should not be considered as a reflection upon the agricultural possibilities of such county as a whole. The only reason for doing so is to make plain the importance and necessity of using these lands for the purpose for which they are best suited.

It is a first principle that all land should be put to its best and most profitable use. Eliminating from consideration all land that is non-agricultural there will remain an abundance of land in this region not yet improved which is susceptible of cultivation. To illustrate, the total area of these ten northern counties is 6,548,195 acres. In 1908 there were only 73,732 acres or a fraction more than 1.1 per cent of the total area under cultivation. Assuming that fully 25 per cent of the total area is non-agricultural in character, there would still be left for agricultural development more than 73 per cent, or approximately 4,800,000 acres.

**Character of Land and Timber.**

Bayfield, the northernmost county, has large areas of poor sandy soil not suitable for farming. A belt of red clay, 6 to 10 miles wide, skirts Lake Superior. This belt contained originally good white pine, with a light mixture of scrubby hardwoods and some hemlock. The southeastern part of the county is mostly gravelly clay loam, and the forest consists of mixed pine, hardwoods and hemlock. The central and western part has a sandy soil covered with a forest growth of jack and Norway pine, with considerable white pine in places, especially the town of Drummond. The county is very nearly cut over.
Only about 5 per cent of the original stand is left. The remaining timber is situated principally in the towns of Mason and Drummond. The first will probably be cut out in four or five years, while in the latter, operations will doubtless continue for a long time.

The good farming soil is very scattered, and there are no large tracts of it. The bulk of the land in this county is best suited for forest growth. Practically every acre of cut-over land has been more or less severely burned by forest fires, and the young growth does not amount to much, because it is seldom able to reach sufficient size to withstand the fires before it is burned over.

The northern third of Douglas county has a fairly fertile red clay soil, and the southern part is very sandy; the central part is intermediate between these two. Hardwood timber is now very scarce; the best stands have been cut out, and at present there are only a few portable mills cutting hardwood in the county. Most of the pine also has been cut, and practically all that is left is situated in three townships in the town of Summit. In all there is probably not more than 100,000,000 feet, and this is being rapidly removed and sawed outside of the county. Very large areas of both Norway and white pine are coming back, usually under a stand of popple and birch. Extensive areas, however, are barren waste, with nothing but scrub and inferior species occupying the ground. The present supply can last only about three or four years more at the present rate of cutting.

Probably one-half of the county is more valuable for growing timber than for any other purpose. The heavy red clay of the north is considered very fertile, and should make fairly good farming land. Many people insist that even the most sandy areas in the southern part are well adapted to hay and cattle raising, but there seems little doubt that the use of such lands for timber production is far more advisable.

Much of the eastern part of Florence county is somewhat sandy, while the central and western part has a loam typical of hardwood land. Along the northern edge it is rocky and hilly, and in the northwestern part there is considerable swamp land. Outside of the two localities last mentioned the land is rolling and in places fairly level. Practically all of the pine has been cut off. At present about 40 per cent of the county is timbered with hardwood and hemlock, most of which is found in the two western tiers of townships. The best information obtainable would indicate that there remain approximately 490,000,000 feet of hardwoods and hemlock. The hardwoods consist principally of maple, birch and basswood, with very
little elm. Just how long the present stand will last is hard to determine. At present no great amount of cutting is going on, and unless the annual cut is greatly increased, it will be at least twenty-five years before the county is entirely cut over. There is a considerable amount of land in this county, especially in the eastern part, which is non-agricultural in character and which can be best adapted to timber growth.

Most of the cut-over land in Forest county is good clay loam, well suited to agriculture, and farming will doubtless become of increasing importance. There are many areas, however, on which farming is out of the question. Probably about 10 per cent of the total area is swamp, and perhaps fully as much is suited only for timber growth because of its rocky and hilly or sandy nature. The northwestern quarter of the county is made up largely of sandy pine lands, and much of the southwest is hilly and rocky. This is one of the best wooded counties in the state, although most of the pine has long since been removed. The forests in the southern part have always been largely hardwoods and hemlock with scattering pine. There are some very good quality hardwoods, and lumbering is extensive. A rough approximation would show about 15 per cent of the area to be swamps and lakes, 20 per cent cut-over, principally pine removed, and about 65 per cent timbered. The remaining timbered area will probably average 100,000 board feet per "forty." This would give a total stand for the county of nearly one and three-quarters billion feet. If the present rate of cutting is continued it will not take much over fifteen years to remove all of the merchantable timber.

The southern part of Iron county is rather level with a sandy soil, and numerous swamps. The central part is clayey and inclined to be rolling and rocky, while the northern part is fairly level with a clay loam soil, gravelly in places. Practically all the pine has been cut and approximately 46 per cent of the hardwood and hemlock. The remaining hardwood and hemlock is estimated at about one billion board feet, and will run from 3,000 to 5,000 board feet to the acre. The predominant species are hemlock, birch, maple and tamarack, with scattering basswood and elm. This timber is found in two bodies, the largest of which comprises the south half of T. 46, R. 1 W., T. 45, Rs. 1 W., 1, 2, and 3 E.; T. 44, R. 1. W., and Rs. 1, 2, 3, and 4 E.; and T. 43, R. 1 E. The other body comprises the southern tier of townships.

Lumbering operations are not being carried on very extensively.
With the possible exception of Florence county less timber is being cut than in any of the other ten counties. The probable length of time the present stand will last can not, therefore, be determined with any degree of accuracy. With a normal amount cut it should certainly last twenty or twenty-five years. But if the present rate of cutting is continued it should last much longer. With the exception of the northern part, the land is essentially forest land and probably can never be adapted to any use other than that of growing timber.

Originally, Marinette county was largely covered with pine, but the greater part of the pine has been cut and a mixed stand of hemlock and hardwoods is left, with considerable pine in some places. Wherever the timber has been cut or even lightly culled, forest fires have run through, and as the result the greater part of the county has been burned over. Extensive tracts of jack pine grow in the central and southwestern part of the county, and large burned-over areas are everywhere. There are extensive areas of agricultural land in this county.

Price county is a typical hardwood county. The greater part of the area is unquestionably well adapted for agricultural uses, being a light sandy loam, varying to a heavier clay, or to a sandy soil in different sections. As in most of the northern hardwood counties, there are many irregular areas of poorly drained land that form typical tamarack, spruce and cedar swamps, many of which will, in time, be drained and successfully farmed. Probably 5 per cent of the total area is of this type, and about the same proportion is so sandy and rock-strewn that a great many years will elapse before complete utilization of such lands will be undertaken. There are rather large areas in the southern part of the county, where the topography is so rough and irregular and at the same time so interspersed with swamps that it is doubtful whether such land can ever be profitably farmed. Probably 10 to 20 per cent of the county would be of greater productive value if continued under timber than it would be if farmed or pastured.

The timber in Price county is typical hardwood or hemlock-hardwood growth, though there are occasional small stands of valuable white pine, and not infrequently some pine is found in mixture with hemlock and hardwoods, but the more extensive white pine formerly abundant in many parts of the county, particularly in the central part, has been pretty well cleaned out for the past ten to twenty years. Most of the hardwood and hemlock has also been removed within 10
to 15 miles of the railroads. Besides the hemlock or hardwoods there is considerable timber occurring as a swamp type, consisting chiefly of tamarack, spruce, cedar and balsam. Of these species only the tamarack is much used for lumber. The principal hardwood species are yellow birch, sugar maple, basswood, white elm, and ash, named in the order of their importance. Hemlock, however, outnumbers all other species.

Young growth on cut-over land is usually of slow-growing or inferior species. Fire almost invariably runs through the lands, and after the fire popple and bird cherry seed in abundantly. Cut-over land almost invariably reverts to such popple growth. In the swamps and undrained land there is frequently very promising reproduction of tamarack which would be of value if protected from fire. Under present circumstances, however, there are probably as many stands of young fire-killed tamarack poles as thrifty growing trees. Cedar also reproduces well in many of the swamps and seems to grow in the wetter situations where fire is not such a damaging factor. Pine reproduction is not at all common in Price county where yellow birch and basswood seed in well. On the whole, however, cut-over lands are either left bare and fire-stripped to come back to popple, or are culled and left in possession of the defective trees, principally maple, good only for cordwood. Probably no hardwood county shows worse effects from forest fires than Price, and millions of feet are killed or injured from this cause annually.

Rusk county has excellent agricultural soil throughout and will undoubtedly make one of the leading farming districts in the northern part of the state. This county was originally heavily timbered, but practically all of the white pine was cut out years ago. The present standing timber consists of hemlock and hardwood in mixture, the bulk of which is situated in the towns of Atlanta, True, Lawrence, Hawkins and Marshall. The average stand is about 5,000 board feet to the acre, with an average value of about $5 per M. A conservative estimate would place the amount of standing timber at 300,000,000 board feet. The cut this year, 1910, will be about 35,000,000 feet, and if this rate of cutting is continued, the remaining timber in the county should last about nine years longer.

Sawyer county, like Price, which borders it on the east, is a typical hardwood county with a light loamy soil that becomes heavier in the southern tier of towns. In the northwestern corner there is a very sandy area characterized by jack pine, Norway pine and scrub oak.
Swamp land is common throughout the county, and makes up from 3 to 4 per cent of its total area. There are numerous lakes in the western half. The timber is chiefly hardwoods and hemlock with scattering pine. There is a considerable area north of the Lac Courte Oreille Indian reservation that is almost barren of valuable timber growth, the soil being a coarse sand covered with a scrubby growth of oak, cherry and paper birch. It is claimed that no valuable timber has ever been cut from this area. In one town in the northeastern part of the county considerable second-growth pine is being cut. Taking into consideration all the timbered land in the county, it is doubtful if the stand per acre will average 3,500 board feet, or 140,000 board feet per forty. Large areas and certain whole townships may average much higher, probably 5,000 board feet per acre.

Vilas county has three grades of soil: sandy, sandy loam, and clay loam. The sandy land, aggregating several thousand acres, is situated principally along the streams. The clay loam is found north of the line between Tps. 42 and 43 and in a part of T. 42, Rs. 11 and 12, T. 41, Rs. 11 and 12, T. 40, R. 12, and in a fraction of T. 40, R. 11, and T. 39, R. 12. Excepting the sandy soil the remainder of the county is for the most part a sandy loam. There are several hundred lakes varying in size, and numerous swamps and a considerable area of pine marsh. Boulders and rocks in large quantities characterize the hardwood region, and in many places, principally around the larger lakes, the country is rough and hilly. Only about 20 per cent of the county remains timbered. The total stand is estimated to be approximately 480,000,000 board feet.

Cut-over Land.

About 60 per cent of Bayfield county, 95 per cent of Douglas county, 50 per cent of Florence county, 20 per cent of Forest county, 45 per cent of Iron county, 75 per cent of Marinette county, 67 per cent of Price county, 78 per cent of Rusk county, 65 per cent of Sawyer county, and 78 per cent of Vilas county has been cut over. Or, to express it in another way, out of the total area of 6,518,560 acres for these counties, the timber has been cut from approximately 4,254,000 acres. A large part of the remainder, however, has also been more or less heavily culled over for pine. Much of this cut-over land is owned by land companies who are trying to dispose of it to settlers at from $10 to $18 per acre. In some of the counties, however, some of the larger lumber companies are not selling their cut-over
land, although they are not holding it for a second crop. Presumably they are retaining title to it in order to continue in control of the town government, thereby making it possible to keep the taxes on their timbered land at a minimum. Not until they have completed operations will these cut-over lands be placed upon the market. While it is not probable that any great amount of it can be sold to settlers, the lumber companies will have little trouble in disposing of it at from $2 to $4 per acre to land companies.

The bringing into use of this great quantity of cut-over land, the bulk of which is now in a state of idleness and likely to continue so under present conditions, is a problem of first importance. Eventually much of it which is fit for agriculture will doubtless be placed under cultivation. Its rapid appropriation for farming, however, is not probable. Through unfortunate lack of information many of the settlers purchase land which is so poor in soil that, even after valiant efforts, they fail to develop it, and finally are compelled to let it go. Not infrequently the land is sold to the poor but well-intentioned non-resident without his having had an opportunity to view it. Often, in such cases, the land that he has purchased is not fit for farming purposes, and the result is abandonment. These cases are cited merely to show some of the elements which are tending to defer the early development of that part of the cut-over area which is susceptible of cultivation.

The most serious phase of the problem, however, is to bring about a utilization of the non-agricultural land. It is not worthless land by any means, for it can be successfully used for growing timber. It is essentially a forest soil and should unquestionably be kept under forest growth. At present the greater part of it is nothing more than waste, and what is worse, the owners can not profitably make it a timber-producing property even if they were so inclined. This class of land, as will be shown, is bearing the heaviest tax burden, and more than any other is entitled to consideration in any plan for an equitable adjustment of taxation. It is this land which should furnish a good part of the future local timber supply, and in order that this may be made possible through private initiative, one of the first steps that should be taken is to provide a rational forest tax law.

Settlement and Agricultural Development.

According to the latest census for which figures are available the ten northern counties had a population of 141,763. About 93,500, or
66 per cent, of this population is reported as living in the various cities and villages, leaving a little more than 48,000 for the rural districts. While many farmers doubtless live in these villages, especially the smaller ones, it is pretty safe to say that, in the aggregate, the greater part of the city and village population is not engaged in agricultural pursuits. Probably most of the male population is employed in sawmills and other wood-working industries. Nor would it be fair to say that the entire rural population is engaged in agriculture. Many of the rural residents work in the woods for the lumber companies. It is probable, however, that that part of the rural population not engaged in agricultural pursuits is about equal to the number of village residents who are so engaged, and this gives an agricultural population of approximately 50,000 for the ten counties. On the basis of five persons to a family, this would give an average of about one family to each section of land. Assuming that these figures are approximately correct it is evident that thus far there has been no great amount of agricultural settlement, nor has agricultural development gone far, since only 77,262 acres, or a fraction over one per cent of the total area, is improved farm land; this would give an average of less than eight acres of improved land to each family.

In Bayfield county, where the total area of all the towns is 900,857 acres, only 4,796 acres is improved farm land. Most of this improved land is used in the production of hay, oats and potatoes. It is probable that this county will never be a foremost agricultural county. There are parts of it that may be adapted to dairying, and still smaller areas where profitable farms will be developed, but a good share of it is a forest soil and should be kept under forest growth. It is the opinion of some that this county should make a good strawberry district. Situated as it is on Lake Superior, the waters of the lake keep the surrounding country very cool until early summer, make a late spring, and, therefore, make possible the raising of strawberries after they are gone in other districts. This industry, however, can never occupy a very large part of the county, and at present but 15 acres are so utilized. Many of the settlers are dissatisfied and would be glad to sell out. This, however, is equally true of many of the other counties.

Although Douglas county is more completely cut over than any of the other northern counties, yet it has only 6,904 acres of improved farm land. With the total area of the several towns aggregating 782,395 acres it is apparent that agriculture is not much developed. The predominant crops are the same as those in Bayfield county. In
Florence county, out of a total area of 307,732 acres, there are 6,450 acres of improved farm land. With one exception, Forest county has the smallest area of improved farm land of any of the counties covered, the total amount being 2,382 acres. It should be remembered, however, that only about 20 per cent of this county has been cut over, and there is a very small amount of such area which is sufficiently accessible to make settlement attractive at this time. Until more of the timber has been removed, there is not much likelihood that settlement will be encouraged by the owners of the land, for the reason that an increasing number of settlers would doubtless make it impossible for the large lumber companies to continue in control of the local government. In all, there are only about 200 settlers. Most of the settlement in Iron county is in the northern part where the best soil occurs and where the timber has been removed. The total area of improved farm land is 2,336 acres. The total area of the county is 453,432 acres. At present settlement is very backward and there is not much prospect that it will improve.

Marinette county is more extensively developed along agricultural lines than any of the others, there being something over 30,000 acres of improved farm land out of a total area of 884,719 acres. In the order of their importance the crops raised are hay, oats, corn, potatoes, rye, barley, wheat and sugar beets. Out of a total area of 777,761 acres for the several towns in Price county there are 10,236 acres reported as improved farm land. The crops raised here are about the same as they are in the other northern counties, with the exception that a larger percentage of the land is in hay, the acreage devoted to that crop being 7,666 acres. At present good land, free of stumps and stones, can be purchased at an average price of from $30 to $35 per acre, but not separate from unimproved land. Some of the best improved land in the center of the county can be bought for $40 per acre, including buildings and other improvements. Rusk county is reported to have 8,638 acres of improved farm land out of a total area of 579,203 acres. The crops are about the same as in the other counties, with the exception that there are a few acres in tobacco and strawberries. The area of improved farm land in Sawyer county is 3,988 acres. The total area of the county is 651,285 acres. It is, therefore, apparent that a very small proportion of the county has been developed along agricultural lines. Here, too, the principal crops are hay, oats and potatoes. Although 78 per cent of Vilas county has been cut over, it has the smallest amount of improved farm land of any,—only 1,458 acres. Se
tlement is very backward at present, and prospects for improvement are not very encouraging. While there is a considerable amount of land in the county, which could be adapted to agricultural use, it is at present so inaccessible that settlers can not come in and clear and farm it with profit.

Probably the greatest deterrent to the settlement and development of these counties is the cost of clearing the land of stumps which ranges from $15 to $100 per acre. This expense, added to the purchase price of the land makes it a pretty expensive proposition, especially for those with limited funds. In many instances the settler is compelled to abandon his land, for the reason that he has not sufficient money to supply him with the ordinary necessities of life until enough clearing has been done to make the land productive.

Annual Cut and Importance of Lumber Industry.

From year to year as the amount of standing timber is reduced, the annual cut is being lessened. This reduction is slowly but surely wiping out the most important industry in these northern counties. The material welfare of many communities in this region has already suffered from the loss of wood-working industries, and as the forest is further depleted, others must likewise suffer. The present importance of this industry in the ten counties is shown by the 750,000,000 board feet of lumber cut during the year 1908. In addition to this, a large amount of timber was cut in these counties for transportation to mills outside. For instance the mills in Marathon county, where more than 143,000,000 feet were sawn in 1908, depend in a large measure on the more northern counties for their timber supply.

If this important industry is to be even partially perpetuated it will be necessary in some way to encourage the growing of new forests, and a reform in the method of taxing forest land should play an important part in making it profitable for private owners to take up the work of reforesting their cut-over lands.

Jefferson County.

Although the study of the tax question in its relation to forests and forestry in Wisconsin is of chief importance only in the northern half of the state, where practically all of the remaining saw-timber is found, it was nevertheless deemed advisable to make a brief investigation of the conditions in one of the typical southern counties, in order to ascertain if possible whether any beneficial results in the way of timber
production or conservation of woodlots might be secured in the agricultural part of the state by a change in the present method of taxation. For this purpose the county of Jefferson was selected.

Jefferson is a typical farm county, and is fairly representative of the southern third of the state which is a rich and level or slightly rolling agricultural section. In 1908, with a total area of 346,720 acres, 124,208 acres were in improved farms. The timber has been almost entirely removed and is now found only in small and widely scattered woodlots. Many farms have practically no timber or forest trees left standing on them, and those farmers who have maintained small areas in woods, appear to value the woodlots more for the shade they afford their cattle than for their wood-producing capacity.

As a result of this widespread grazing of the woodlots but little young growth is coming in. Consequently, with the gradual dying out of the old trees, the stands have each year become more and more open until now, in most cases, the forest floor is covered with grass, and the so-called woodlot is really only an open grove of scattered trees, bearing little resemblance to true forest and destined to disappear with the death of the present mature trees.

When dealing with land of such great agricultural value as is found in this county, the question naturally arises whether the farmers can really afford to practice forestry or conservatively manage their existing woodlots. Any discussion as to remedial tax legislation that does not give full consideration to this question of the most profitable use to which lands can be put, will necessarily fall short of the mark.

Land values throughout Jefferson county range from $80 to $150 per acre, the only exceptions being very limited areas of rough land in the southeastern part of the county and scattered marsh land constituting scarcely one per cent of the total area. Such marsh land has a very fluctuating value and in some years may be purchased as low as $10 per acre. Existing woodlots, however, are principally limited to typical agricultural soils, and there need be no hesitation in acknowledging that sites of this character could be made far more productive financially if cleared of their timber and converted into farm land. It is doubtful, however, if there is at present over 15 per cent of this farming section that is occupied by such woodlots, and there is, therefore, no great urgency on the part of the landowners to clear off this small remnant. Yet this per cent is certain to decrease during the next fifty years, unless the farmer can be convinced of the unwise of further depriving the county of its natural forest cover.
From interviewing many farmers in the county it is apparent that the more progressive of them are really interested in caring for their woods, and are of the opinion that they can often well afford to leave a strip of woodlot on $100 land, because of other considerations than the direct money return from the woods. In many cases the value of a large part of a farm is enhanced by the protection from parching winds afforded by a neighboring woodlot. The regulated and limited use of a woodlot as shade for cattle is also greatly appreciated by most of the farmers. It will undoubtedly be to the advantage, then, of the country in general to maintain at least 5 per cent of even such valuable land as this in timber, and there seems to be no doubt that some adjustment of taxes in favor of small woodlots would prove very beneficial.

It is right here that the question of taxation, as applied to timber, is an important factor. Timber land throughout the county is assessed as high as the cultivated land on a farm. Yet in spite of this there are many farmers who prefer to keep from 10 to 15 acres in timber. If the productive capacities of fields adjacent to a forest are augmented by its protection, the increased earning power of that field should not be charged, for taxation purposes, both to it and to the forest as well. The forest land should be taxed only for what it can be made to produce in wood material. The amount necessary to be raised by taxes will naturally be made up on the agricultural land, but such adjustment would unquestionably encourage the farmer to preserve his woodlands and enable the more enterprising to practice forestry at a fairer profit. Fully 5 per cent of the area of any farm community should be kept forested, as the most progressive residents fully realize, for the sake of both the community and the individual.

It is evident that, under such a plan, the larger the forest area on a farm the lighter the owner's tax would be, yet the greater productive capacity of the land when devoted to farming, would automatically check a farmer from trying to reduce his taxes by maintaining large areas in woods. By reducing the valuations on woodlots to 25 per cent a progressive farmer would simply be encouraged to maintain his 5 to 10 acres of woodlot, or as much as he might need, and the farmer who would take no interest in preserving his trees would, of course, feel the increase in the tax on his farm land. The average farmer, however, would scarcely feel any difference in his tax burden.