RESULTS
of
IMPROVEMENT CUTTINGS
at
EBER-WHITE-WOODS

April 19. 1937

E.V. Brender

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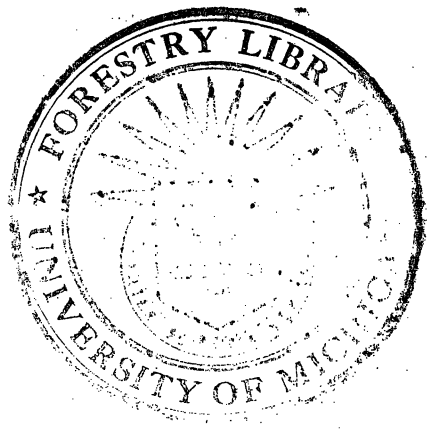

R E S U L T S

of

I M P R O V E M E N T C U T T I N G S

at

E B E R - W H I T E - W O O D S

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INTRODUCTION

This paper represents a thesis for the degree of Master of Forestry in the branch of silviculture. The study has been carried on under the sponsorship of Professor Leigh Young, who is Professor of silviculture at the School of Forestry and Conservation at the University of Michigan.

The Scope of the Investigation.

The investigation concerns itself with the computation and interpretation of data collected at Eber White Woods, where over a period of twenty years improvement cuttings have been carried on and information has been collected which enables a comparison of the original stand with the present stand. The purpose of this study is to determine the changes that have taken place in the composition, in the stocking, and in the diameter distribution of the stand. It is beyond the scope of this investigation to account for the specific changes which have occured. The data that were available would not warrant any definite conclusions in that respect. There is no information on hand regarding tree forms and decay, or regarding the site factors in the stand. The study is limited to describing the changes that have taken place from one decade to another. It is a comparative analysis of the stand in its original condition and its present condition as influenced by the improvement cuttings. From this comparative study certain conclusions may be drawn which may serve as a guide for future silvicultural treatments.

Method of Investigation.

Before considering the method of investigation it will be necessary to mention briefly the manner by which the information concerning the stand was obtained. Eber White Woods consists of a 43 acre tract of mixed hardwoods. The area is subdivided into ten compartments of 4.3 acres each. A separate record is kept for each compartment. The species are recorded by one inch diameter classes. A complete inventory of the stand was taken before the first improvement cutting took place and again after the last improvement cutting was carried out. This study concerns itself with compartments one, four, six, and ten. Compartment four represents a fifteen year interval since the first improvement cut was administered, while the others represent only a ten year interval.

The method of investigation consists of computations which bring out more clearly the changes that have occured as a result of the silvicultural treatment. First, the composition of the original stand is compared with that of the present stand. Second, the changes which have occured within each individual species are considered. Third, the percentage changes of each species, as compared to the sum total change in the stand is taken up. Fourth, the change in the diameter distribution of the more desirable species is taken up. Their mean diameter, the standard deviation and the coefficient of variation are computed to illustrate the general trend of the diameter distributions. Based upon the results of these computations a comparative analysis

of the original and the present stand is made from the viewpoint of change in composition, diameter distribution, and stocking of the stand. A summary is included emphasizing the pertinent facts which have become evident from the investigation. The same procedure of investigation is persued for each one of the four compartments. The charts which resulted from the computations are included in the appendix. They are refered to in the text by the following symbols: "A" for compartment 1, "B" for compartment 4, "C" for compartment 6, and "D" for compartment 10.

PRELIMINARY DISCUSSION

In order to obtain a more complete picture of the stand, a brief history and stand description, and a discussion of the manner of improvement cutting is here given.

History of the Stand.

The tract was acquired by the School of Forestry and Conservation in 1905. The stand had been cut-over repeatedly for its better species. Grazing and fires had undoubtedly taken their toll; consequently trees of poor form, decadent trees, and a preponderance of less desirable species were left behind. There were some large Oak trees left standing, which the former owner had left for sentimental reasons. These large trees have assumed the dimensions of wolf trees and have complicated the silvicultural treatment of the tract.

Stand Description.

The stand is located in the S E 1/4, S E 1/4, Sec. 30, T 2 S, R 6 E, Mich. P.M. It is adjacent to the western limit of the City of Ann Arbor. The stand comprises the native hardwoods of Lower Michigan. The tract is now under fence, and is protected against fire and grazing. The land is of medium fertility, it is on rolling ground of the interlobate morainf region and consists of a variety of soils from sandy land to clay and gravel. The soil supports in addition to the hardwood stand, a herbaceous ground cover of a rather rank growth and of medium density. Grasses are intermingled sparcely with the herbaceous weeds. Some of the outcroping rocks are covered with moss.

Under-brush is very sparce, it consists of a few raspberry, blackberry, gooseberry, some prickly ash, and a few stray barberry bushes.

Improvement Cutting.

The tract is managed as a selection forest on a ten year cutting cycle. These cuttings up to date have assumed the nature of improvement cuttings more than that of harvest cuts. The object has been to improve the composition of the stand, and to obtain good tree forms, and to rid the stand of decadent trees. Cleaning cuttings at five year intervals have also been carried on. They were in the nature of light cuttings, removing the less desirable species which could not be removed during the harvest cut for fear of opening up the stand too much. The silvicultural treatment has been hampered somewhat by the presence of these large wolf trees which in view of the potential park value of the tract have been left standing.

ANALYSIS OF COMPARTMENT I

ANALYSIS OF COMPARTMENT ONE

The first cutting in compartment 1 took place in 1922. An intermediate cut in the form of a cleaning cutting was administered in 1927; and the last cut took place in 1932. In the following discussion reference shall be made to the charts designated by "A", in the Appendix.

Changes in the Composition.

Chart "A" 1 in the Appendix compares the original stand and the present stand by tree numbers and by basal areas of each species in percentages to the total stand. It seems that comparatively little change in the composition of the stand has taken place. However, it must be noted that the percentages of tree numbers show an increase for the desirable tree species, while the less desirable species, ironwood, shows a decrease from 52% to 44%. The basal area relationship has remained more constant. The outstanding feature there, is the decrease in basal area of white oak which decreased from 24% to 20%. The greatest change has occurred with white ash and black cherry. The former increased from 6% to 11% by numbers and from 2% to 4.5% by basal area. Cherry increased from 1% to 3% in number of trees and from 0.5% to 1.5% in basal area. Hard Maple increased from 0.3% to 1.3%, its basal area remaining the same. Red Oak shows an increase of 1% by numbers and a slight increase in basal area. Elm has been reduced from 6% to 4% by numbers and from 5.2% to 3.6% by basal area. While ironwood decreased in number, its basal area has slightly increased. The composition of the stand is determined much more by the basal area representation of

a species than by tree numbers. The dominant trees of the stand are the larger trees, and they make up the bulk of the basal area in the stand. High percentages of tree numbers of a species with accompanying low percentages of basal areas indicate potential changes which the stand may undergo as a result of silvicultural management.

Degree of Change of the Various Species.

Chart 2 is a summary of the computations for each individual species, it indicates the degree of change that has taken place in relation to the sum total change in the stand. It becomes evident from a study of this chart that the stand has undergone greater changes than the result of chart 1 indicates. The stand has decreased in tree numbers by 13% and increased in basal area by 12%. The greatest changes in the composition of the stand by tree numbers have occurred in ironwood, 50% of the sum total changes took place in that species. White Ash comes next with a relative gain of 13%, basswood displayes a reduction of 12%, elm is reduced by 9%, black cherry gained 5%. The changes in the basal area relationship are quite different. Red Oak has undergone the greatest relative change, its basal area accounts for a 27% increase over the other species, white ash comes second with a 16% increase. Ironwood increased 12%, but white oak decreased nearly 11%. It is of interest to note that practically all species increased in basal area. Even basswood increased its basal area by 9% although in numbers of trees it decreased by 12%. Elm has declined considerably,

its relative loss in number of trees is 9%, and in basal area it is 6%. In connection with this chart it must be remembered that these percentages do not express absolute values but rather a degree of change related to the sum total change which the stand has undergone.

Changes within the Individual Species.

Each species has been considered separately in regards to changes by tree numbers and basal areas within each one-inch diameter class. The trend in reproduction and the diameter distribution of a species become evident from the tables in the Appendix designated as A 3 a, 3 b, etc. A brief discussion of each species shall be given here.

Red Oak: Red Oak is the consorting species in the stand. It makes up 28% of the basal area of the stand and has undergone a change of 27% in basal area of the sum total change in the stand. Numerically it increased to 124.5% of its former representation and to 120% of its former basal area. Much of the gain in number occurred in the 1 and 2 inch diameter classes. The diameter distribution from 3 to 10 inches inclusive is very deficient. From 11 inches to 22 inches the species is well represented. There are also a few trees in the higher diameter classes. These trees seem to be growing at a rate of 2 inches in diameter per decade. The average diameter of the stand of Red Oaks has remained practically the same. This is due to the removal of some of the larger trees and also due to a greater percentage of saplings in the stand.

White Oak: White oak displayes a decided loss in the sapling stage. It amounts to 29% in the 1 inch class. In all, white oak has decreased to 93% in number and to 92% in basal area of its original number. It is on the decline in the composition of the stand, as is indicated by the relative drop off in basal area of nearly 11%, from chart 2. White oak still makes up 20% of the basal area in the stand. The oaks as a group constitute nearly 50% of the basal area, but only 7% of the stand by tree numbers, with a slight decrease in basal area and a slight gain in number of trees over that of 1922. The diameter distribution of white oak is fairly good up to 16 inches, above that diameter, it is very scattered. There are a few large trees left standing, the biggest being 38 and 39 inches in diameters. These large trees at the best are growing at a rate of one inch in ten years. When these trees are removed, white oak will soon join the ranks of concomitant species.

White Ash: White Ash displayes the greatest gain of any species in the sapling as well as in the pole class. It increased 53% by tree numbers and 148% by basal area. The 1 and 2 inch classes alone make up 44% of the total gain. The pole class up to 7 inches gained another 50%. ~~Above the 7 inches gained another 50%~~. Above the 7 inch diameter class only a few scattered trees are found. The biggest of which is 15 inches in diameter. The growth rate in diameter seems to be somewhat over 2 inches per decade. In spite of the large increase in the small diameter classes the average diameter has increased from 2.35

inches to 3 inches. Ash will undoubtedly assume a more prominent position in the future stand than it has formerly maintained.

Hickory: Hickory decreased in tree numbers to 90% of its former representation, but increased its basal area to 112%. The change in number has taken place mostly in the 1 to 8 inch diameters. The diameter distribution up to 14 inches is good. Above that only a few scattered individuals are present to a 22 inch limit. The greatest gain has taken place in the 9 inch diameter class , while the greatest losses occurred from 8 inches down. But hickory is still well represented in these lower classes. Hickory makes up 12% of the total basal area of the stand; it is represented by a higher percentage of saplings than the oaks in the stand. Though the red oaks show a tendency toward an increase in the composition of the stand, while the hickories show a tendency toward a decrease.

Basswood: Basswood makes up 22% of the stand by tree numbers and nearly 11% by basal area. There has been a marked decrease in the 1 and 2 inch classes, and a gain from there on up to the 9 inch class. In all, basswood decreased to 86% of the original number, practically all of which took place in the 1 and 2 inch diameters. Its basal area increased to 116.5%, this increase took place in the 3 to 9inch classes. The diameter distribution to a 10 inch diameter is satisfactorily. There are only 3 trees above that diameter, the largest of which is 24 inches with a slow growth rate of about 1 inch in a ten year period. It is to be noted that the 10 inch class is the limit of regular diameter distribution both in 1922 and in 1932.

Elm: Elm has lost considerable ground in the composition of the stand. It was reduced from 6% to 4%, (chart 1.) It contains only 60% of its original number and 77% of the original basal area. The greatest decrease has occurred in the sapling class, amounting to 80% of the total change. The diameter distribution of Elm is good to a 7 inch diameter. Above that it is patchy to a 15 inch limit.

Black Walnut: Black Walnut is decidedly a concomitant species in the stand. It makes up only .42% of the stand in tree numbers and 2.6% in basal area. Walnut is of high intrinsic value and deserves every consideration. The species decreased to 81.3% of its original number and increased to 132% by basal area. The greatest decrease was suffered in the first four diameter classes. One is not justified in drawing definite conclusions regarding the probable trend of walnut in the composition of the stand, the species occurs in such limited number that any little change assumes relatively large proportions which may not express the trend of the species. The average diameter increased from 9.1 to 11.8 inches, it seems to be growing at a rate of about 2.5 inches per decade.

Black Cherry: Black cherry is decidedly on the increase. It increased roughly from 1% to 3% in the total stand composition. And gained 122% over its former representation in tree numbers and 210% in basal area. Most of the gain, 64%, occurred in the 1 inch class. Its diameter distribution stops at 6 inches, excepting two larger trees,

one 14 inches in diameter, the other 20 inches in diameter. The latter is of a doubtful character since no large cherry was recorded on the 1922 tally.

Hard Maple: Hard Maple also is increasing. It was represented by 0.3% in 1922 and constituted 1.4% in 1932, in the composition of the stand. It increased to 420% by tree number and to 114% by basal area of its original value taken as 100%. 80% of the gain was obtained in the 1 and 2 inch diameters. These are really almost the only diameters represented in that species. There is a 17 inch tree which is probably responsible for the increased reproduction. The species appears to be a slow grower, putting on only one inch in ten years in this stand.

Ironwood: Ironwood by numbers has been reduced from 52% to 44% in the composition of the stand. The basal area remained almost the same, namely 16% of the total stand. It makes up 74% of the original number of ironwoods and 114.5% of the original basal area. The loss has been incurred in the 1 to 3 inch diameters, while the gain especially in basal area has occurred in the 3 to 6 inch diameter. There are present a 7 inch and a 8 inch tree, which are probably of seed bearing size. 1937 is the time for an intermediate cut in compartment one, and these larger trees will probably be removed in favor of reproduction of more desirable species.

Miscellaneous Species: This chart was prepared for species which occurred in such small numbers so that they could not be treated

separately. They are mostly less desirable species, such as blue beech, crab apple, service-berry, dogwood, sassafras, one butternut and one scotch pine. There has been an increase by numbers, but the basal area has been decreased from 0.9% to 0.5%. It is seen that these species are of little importance in the stand.

DIAMETER DISTRIBUTION AND STOCKING OF THE STAND

Chart 4 illustrates the diameter distribution of the more desirable species. The latter make up 105% of the original number of such species. The gain occurred mostly in the 3 to 7 inch diameter classes. The average diameter has increased, as computed from frequency tables, from 3.18 inches to 3.82 inches. The standard deviation in 1922 was was 4.19 inches, but in 1932 it had increased to 4.42 inches. However the coefficient of variation indicates a closer grouping of diameters about the mean value. It had changed from 132% to 108%. This is a sign that the stand is approaching a more regular diameter distribution. Up to a 16 inch diameter the stand has a fair distribution, above this diameter the trees are sparcely and scatteringly represented. In 1922 the 14 inch diameter class marked the limit of fair distribution.

The stocking of the stand, when including the less desirable species, is good. The spacing figure changed from 20.7 to 19.9. The average diameter of the stand increased from 4.1 to 4.7 inches. This clearly shows that the stand is closing up.

SUMMARY

The pertinent facts which have become evident from this analysis shall now be emphasized. First, the stand is undergoing a favorable change in composition as illustrated by the percentage increase ~~of~~ of the more desirable species. This change is tending toward a decided increase in the representation of white ash, black cherry, hard maple, and also red oak. White oak and elm are loosing ground in the composition of the forest.

Second, reproduction of white oak is falling off, while that of red oak is increasing. It is possible that this difference lies in the fall germinating character of the white oaks which may encounter unfavorable weather conditions at that time, while the red oaks germinating in the spring do not encounter this difficulty.

Third, the less desirable species, ironwood, while decreasing its representation by numbers, has slightly increased in basal area, which makes up 16% of the stand. The basal area of that species can readily be reduced by the removel of some of its larger trees in the 6-7 and 8 in diameter class.

Fourth, the diameter distribution of the more desirable species is improving. It is fairly well represented to a 16 inch limit, above that, the distribution is deficient.

ANALYSIS OF COMPARTMENT IV

ANALYSIS OF COMPARTMENT FOUR

In compartment four a fifteen year interval has elapsed since the initial improvement cut was administered in the year of 1920. A second improvement cut was applied in 1930, and an intermediate cleaning cutting took place in 1935.

Changes in the Composition.

The changes in the composition of this compartment are more pronounced than those of any other compartment. Chart B-1 of the Appendix illustrates this change. The outstanding features are, the marked increase in hard maple and white ash, and the decrease in Ironwood. Maple increased numerically from 5% to 17%, and by basal area from 7% to 11% in the composition of the stand. White ash changed from 4% to 14% by numbers, its basal area remained the same. Ironwood decreased its occurance from 54% to 37% and its basal area decreased from 11% to 6%. Basswood likewise has changed its relative position in the stand. Numerically it increased from 5% to 7%, but by basal area it decreased from 11% to 7%. Red oak has slightly increased in tree numbers, and increased in basal area from 24% to 32%. While white oak has somewhat reduced its relative position in the stand, the same holds true of hickory and elm. Walnut and black cherry have slightly increased their representation in the stand, the total of which amounts to but 1% by numbers and about 4% by basal area.

Degree of Change of the Various Species.

This discussion is based upon chart B-2 which is a summary for the tables prepared for the individual species. It serves to bring out the degree of change which a species has undergone in relation to changes sustained by other species. Again, it becomes evident that ironwood has suffered the greatest change. It makes up 45% of the change in tree numbers in the stand. Its basal area displays a relative decrease of 15% of the basal area change in the stand. Hard maple comes next with a gain of 15% by numbers and one of 20% by basal area. White ash gained 12% relatively and 2% by basal area. Red Oak shows the greatest relative increase in basal area of any species, namely 36%, it is the most vigorous species in the stand. Basswood and elm display a large relative decrease in basal area, although basswood gained 1.5% in numbers, its basal area loss amounts to 13% of the change within the stand. Elm decreased by 7% in both columns. The stand as a whole decreased its stems by 20% and increased its basal area by 7%.

Changes within the Individual Species.

Tables for the individual species in the stand were prepared to determine the changes which occurred within a species by diameter classes. The trend of change of a species becomes evident from an analysis of these charts. The charts are attached to the Appendix under Compartment four.

Red Oak: Red oak has increased to 114% of its original number and to 140% of its original basal area. There is an increase of 14% in the sapling class, but the pole class which formerly was deficient has further reduced, so that practically no trees are present between the 4 and 9 inch diameters inclusive. From 12 inches on up there has been a general increase in the representation of trees per diameter class to a 24 inch limit. It is within this latter group of trees that the large basal area increase has occurred. The average diameter of red oak increased from 13.7 inches to 15.1 inches. Although the species makes up only 4% of the stand by tree numbers, it is nevertheless the dominant species in the stand, as indicated by the basal area which constitutes 1/3 of the total basal area of the stand.

White Oak: The basal area of white oak has remained constant, but it is rapidly falling off in the numerical representation of the stand as shown by a decrease to 65% of its original number. There has been a reduction of white oak from the 1 inch class to the 9 inch class diameters. The 16 inch diameter marks the unbroken diameter distribution of white oak. The remaining trees seem to be growing at a good rate of apparently ~~over~~ 2 inches in diameter per decade. The average diameter increased from 8.4 to 10.7 inches.

Hard Maple: Hard maple is the most aggressive species in the stand. It increased over its original number by 150% and by 84% over its basal

area. Of this increase 70% were sustained in the sapling class. Above the 4 inch diameter the representation of maple falls off rapidly and ceases at 14 inches, with only an occassional tree above that diameter. There appears to be a discrepancy in the data for the 25 inch trees, of which 3 are recorded in 1935, while only one tree was recorded in 1920 which could have grown to that size in the interem. The growth rate of the larger maples seems to be at a rate of slightly over 2 inches in diameter per decade.

White Ash: Among the better species white ash displays the second largest gain in the numbers of the more desirable species, although its basal area increased but little. The numerical change amounts to 243% of the original, and the basal area changed to 108%. The bulk of the increase, 80%, was obtained in the 1 to 3 inch diameters, while the 9 to 17 inch diameter classes have reduced their representation in the stand. From the 9 inch diameter class to the 24 inch diameter class white ash is but scatteringly represented. In view of the large amount of saplings in the stand it may be expected that ash will assume a more dominant position in the future stand.

Basswood: Although basswood has increased in numbers to 118% of the original, its basal area has reduced to 68% of the original. The gain has been obtained in the 2 and 3 inch classes. The basal area loss resulted from the removal of some of the larger mature trees. The diameter distribution is continuous to a 14 inch diameter, however

from a 10 inch diameter upward it is sparcely represented. Formerly a 10 inch diameter marked the limit of unbroken diameter distribution.

Hickory: Hickory is on the decline in its representation in the stand. It represents only 56% of its former number. The sum total basal area remained constant. There occurred a 44% decrease in the 1 inch diameter class alone by tree numbers and an average 5% decrease per diameter class from there on up to the 9 inch class. The diameter distribution is good to a 15 inch diameter. A few larger trees are represented above this diameter.

Elm: The decrease in elm is very marked, it makes up only 57% of the original number and 72% of the former basal area. The reduction occurred in the sapling class where it amounts to 85% of the total decrease of that species. The diameter distribution is satisfactorily to an 11 inch diameter. Above this diameter only a few trees are represented.

Walnut: Black walnut assumes an insignificant position in the composition of the stand. It makes up only 0.4% by numbers and 3% by basal area. The species appears to be on the increase in the stand. From a careful analysis of the chart it seems however that the records for black walnut are none too reliable. The diameter growth of the trees varies from 2 to 5 inches, during a 15 year period; while a large 28 inch tree seems to have decreased in diameter or else has come up from no-where.

Black Cherry: Black cherry likewise occupies an inferior position in the stand. It makes up only 0.6% by numbers and 0.8% by basal area. The species is displaying an increase to 167% by numbers over its original number, the basal area remaining the same.

The Less Desirable Species: Of the less desirable tree species ironwood is the most important species, it constitutes 37% of the stems in the stand and 6% of the basal area of the stand. Ironwood has been reduced to 54% of its original representation, and to 62% by basal area of its former representation in the stand. The species is now represented to a 6 inch diameter, while formerly it occurred to an 11 inch diameter. Most of the reduction however took place in the 1 and 2 inch diameters which may indicate that the source of previous, much heavier reproduction, has been eliminated.

Blue beech, which now makes up 4% of the stand by numbers has been reduced 50% from its original number in the stand and 53% by basal area.

Dogwood of which no representatives were recorded in 1920 now constitutes 1% of the stems in the stand and .08% by basal area.

DIAMETER DISTRIBUTION OF THE MORE VALUABLE SPECIES IN THE STAND

The more desirable species in this compartment have increased by 8.6%. Most of the increase took place in the 2 and 3 inch diameter classes. The distribution is good to a 25 inch diameter. It extends to a higher diameter limit in this compartment than it does in any other compartment. Statistical calculations will describe this diameter distribution more adequately. The diameter distribution of the more desirable species changed from 4.26 inches to 4.42 inches. The standard deviation remained at practically 5 inches. The coefficient of variation changed from 118% to 112%. It is seen that the diameter distribution of this stand has not changed very much, with the exception of a large increase in the 2 and 3 inch diameter classes, and an extension of the continuous distribution in the upper diameters from 20 inches to 25 inches.

The stocking of the stand as a whole has slightly closed up. In spite of a reduction of 45% of the large amount of the less desirable species, the spacing figure has changed from 21.18 to 20.46. The stand reduced to an average acre basis has undergone the following changes: It changed in numbers of trees from 680 to 543 trees, in basal area it increased from 76.35 to 81.69 square feet, the average diameter increased from 4.5 inches to 5.3 inches. Expressed in percents the number of stems decreased 29% while the basal increased 7%.

SUMMARY

The important changes which this stand has undergone during a 15 year interval, from the first to the last applied improvement cut, are now summarized:

In general, the composition of the stand has undergone a decided change.

This change is reflected by quite a large increase of hard maple, and by a large increase of white ash.

Red oak is an aggressive species in the stand, while white oak is on the decline.

Basswood, black cherry, and possibly walnut display a tendency to increase their representation in the stand.

While hickory and elm are decreasing in the stand composition.

The less desirable species have greatly reduced their position in the stand. This reduction may be expected since the more desirable species have increased their representation by 8.5%.

The stand has decreased in number by 20% and increased its basal area by 7% with an accompanying decrease of the spacing figure from 21.2 to 20.5.

The diameter distribution of the more valuable species has changed but little. The coefficient of variation decreased from 118% to 112%, this indicates a tendency toward a more regulated distribution. The latter is now fairly well represented to a 25 inch diameter.

ANALYSIS OF COMPARTMENT VI

ANALYSIS OF COMPARTMENT SIX

The first improvement cutting upon this compartment was administered in 1922. This was followed by a light cleaning cutting in 1927, and by a second improvement cut in 1932. An intermediate cut will again take place in 1937. The tables refered to in the following discussion are found in the appendix. When references to percentages are made, only whole numbers are given in the text, while in the tables they are carried out to fractional values.

Changes in the Composition.

Chart 1 compares the original composition of the stand with the composition of the present stand on a percentage basis by numbers of trees and by basal areas. It is seen from this table that in 1922 the more desirable species comprised 51% of the stand by tree numbers, and while in 1932 they made up only 37% of the stand. However, by basal area the stand comprised 94% of the better species in 1922, and 95% of such species in 1932. This indicates that the dominant canopy, made up of the better species, is holding its own in spite of a large removal of its bigger trees and in spite of an increase of the less desirable species. The latter have increased in number from 49% to 63% but decreased in basal area from 6% to 5% of the basal area of the stand.

It is seen from this chart that white ash, elm, and basswood are the only ones of the more desirable species which have increased their numerical representation in the stand. All other species display a

decided decrease. White oak has been reduced to one half its former position in the stand. Red oak likewise has suffered a considerable drop in tree numbers. The basal area relationship has remained much more constant. Though, white oak has been reduced from 21% to 15% of the basal area in the stand, red oak has increased from 43% to 49% by basal area representation. Other species, irrespective of an increase or decrease in numbers have maintained about the same basal area.

Degree of Change of the Various Species.

From a study of chart 2 the degree of change that has taken place becomes more pronounced. The greatest change in the numerical representation of species has occurred in white ash and elm. They display a respective increase of 8% and 6%. The oak group has undergone the next greatest change, it was reduced by 9%, hickory was reduced by 3%, while basswood increased by 3%. Of the less desirable species, ironwood has gained 68% in relation to the sum total change that the stand has undergone.

The basal area changes do not correspond with the numerical changes, except in the case of white oak and hard maple. The former has undergone a negative change of 30% by basal area; and maple which decreased numerically by 0.3% lost 3% by basal area. On the other hand, red oak which has undergone a negative change of 3% by numbers has changed positively by 48% in basal area. The same holds true of hickory, it decreased 3% in numbers but gained 4% in basal area. White ash changed

favorably both in number and in basal area; while the basal area increase for elm is very slight, although it had increased numerically almost 6.5%. This same relationship is brought out more forcefully with ironwood which had undergone a positive change of 68% numerically, but gained only 1.5% by basal area. It must be remembered that these figures do not indicate so much the relative importance of a species in the stand, but they do indicate the degree of change that a species has undergone relative to the change undergone by other species. It brings out the tendency of change in the stand.

Changes within the Individual Species.

The preceding discussion has considered the direction of change of the species in relation to each other. The next consideration shall deal with the changes that have taken place within the individual species.

Red Oak Group: The red oaks display a favorable trend in reproduction. A positive change of 9% in the 1 and 2 inch classes is recorded. Although the species makes up only 89% of its original number, the basal area has increased to 118% of the original. The diameter distribution is deficient, almost lacking, from the 3 to the 6 inch class. Other diameters are well represented to a 19 inch limit. The larger trees are growing at a rate of 2 inches per decade. The average diameter of red oak has increased from 10.35 to 11.9 inches.

White Oak: White oak is on the decline in the composition of this stand. Reproduction is falling off. There is a negative change of 64% between the 2 and 6 inch diameters. It constitutes only 66% of the

original number and 77% of the original basal area. Fair diameter distribution is limited between the diameters from 4 to 13 inches. Above and below these diameter classes the distribution of white oak is very deficient. The larger trees of the species 31 and 35 inches in diameter are still growing at a rate of 2 inches per decade.

White Ash: White ash shows an increase of 88% by numbers and 16% by basal area within the 1 to 3 inch diameter classes. It mounted to 341% of its original number and to 157% of its original basal area. The diameter distribution above 3 inches is very scattered with few representatives here and there to a 17 inch diameter limit. The growth rate of the individual trees, of large pole size, is again 2 inches per decade.

Hickory: Hickory is loosing ground in the small pole class. Reproduction, in the form of saplings is at a stand still, but from an 8 inch diameter upward the species has increased its representation in the stand. The general trend is toward a reduction of hickory. It makes up numerically only 72% of the original number and 106% of the basal area. The diameter distribution, when hickory is considered as a concomitant species in the stand, is good.

Maple: Maple, in general has maintained the same position in the stand. Its representation is 98% of the original by numbers, and 97% by basal area. However, a relative gain of 41% in the sapling class is significant as it indicates a future increase of maple in the composition of the stand. The diameter distribution with the exception of

the 3 and 4 inch class is good to a 17 inch diameter. There is a 22 inch diameter tree recorded in 1932, while in 1922 a 16 inch tree marked the upper diameter distribution. This would indicate an error in the tally of the species at one time or another.

Elm: In the sapling class elm is well represented. Numerically it has increased to 263% of the original occurance, but only to 104% of the basal area. Most of the increase occurred in the 1 and 2 inch diameters. Elm representation above the sapling class is insignificant.

Basswood: Basswood displayes a large relative increase over its original frequency. It mounted to 534% by tree numbers and to 741% by basal area. It is present only in the 1 to 4 inch diameter classes, and makes up but 1.44% of the total stand table and 0.16% of the basal area of the stand.

Black Cherry: Black cherry also shows an increase in the sapling class. This species makes up only 0.45% of the stand, but it seems to be on the increase.

Black Walnut: There are no black walnut trees below the 9 inch diameter class. The few saplings which were present in 1922 have disappeared. There are only 4 representatives of that species in the stand.

Less Desirable Species: Ironwood has nearly doubled its former representation in the stand, though its basal area remained practically the same. This species makes up 60% of the stand in numbers and 5%

by basal area, as against 44% and 5% respectively in 1922. All of the increase has occurred in the 1 to 3 inch diameter classes. While 47% of the basal area was removed from the larger trees, 53% were gained in basal area by the smaller trees, There still are a few of the larger ironwoods standing.

Other less desirable species are of minor importance in the stand, Although dogwood shows a 50% gain in the 1 inch class, the remaining 50% change resulted in elimination of dogwood in the 3 to 5 inch diameter classes. Hawthorn was entirely eliminated. Blue beech displayes a very slight increase. These species at the present time are of no importance in the stand.

DIAMETER DISTRIBUTION OF THE MORE DESIRABLE SPECIES

From chart 4 it is seen that the representation of the more desirable species in the stand has increased by 6%. Most of this increase took place in the 1 and 2 inch diameter classes. The frequency distribution of the diameters can best be described by statistics. In 1922 the average diameter was 7.8 inches and in 1932 it had increased to 9.35 inches. The standard deviations were respectively 4.74 and 4.96 inches. While the coefficient of variation changed from 61% to 53%. This clearly indicates that the better species in the stand are gaining and that their diameter distribution is becoming more and more normal. The distribution to a 17 inch diameter is fair, there is however a deficiency in the 3 to 5 inch diameters. Above the 17 inch diameter the

distribution is broken and scant. The change in the stocking of the stand, including the less desirable species, is reflected best by the spacing figure, which changed from 20.02 to 19.68. The average number of trees per acre changed from 355 to 515 trees per acre; while the basal area increased from 85.53 sq. ft. to 88.49 sq. ft. per acre. The average diameter of the stand as a whole, as computed from basal areas, decreased from 6.6 inches to 5.7 inches. This change is not significant, it is the result of a large increase of ironwoods in the 1 and 2 inch classes.

SUMMARY

The outstanding facts which have become evident from the analysis of compartment six are as follows:

First, the proportion of the more desirable species in the stand is increasing as illustrated by an increase to 334% in the 1 inch diameter class and an increase to 228% in the 2 inch diameter class of the original representation of such species.

Second, the diameter distribution of the more desirable species is improving as illustrated by a decrease in the coefficient of variation.

Third, white ash, elm, and basswood are aggressive species in the stand as shown by the increase of their tree numbers.

Fourth, red oak is the consorting species in the stand and it displayes a strong tendency to maintain that position; while white oak is decidedly on the downhill grade in the composition of the stand.

Fifth, Ironwood displayes a large increase in the composition of

the lower canopy of the forest. This, however, is no indication of an undesirable effect upon the stand. Ironwood as a nurse tree and as a site improver may fullfill a much needed task. When competition with more desirable species arises the competing ironwood can always be removed. In the absence of such competition ironwood may well act as a beneficiary agent.

ANALYSIS OF COMPARTMENT X

ANALYSIS OF COMPARTMENT TEN

The first improvement cut was applied to compartment ten in 1926. An intermediate cut took place in 1931, and the last improvement cut was administered in 1936. Additional silvicultural treatment consisted in the planting of coniferous species. In the following discussion reference is made to the tables found in the Appendix under compartment ten.

Changes in the Composition.

The changes in the general composition of the stand become evident from chart 1. The striking feature of the change is again, the marked increase of white ash which increased by numbers from 6% to nearly 11%, and from 2% to 4% by basal area, in the relative composition of the stand. Other natural increases in the stand composition have occurred in hard maple and black cherry. The former increased from 0.4% to 1.5% by tree numbers and from 1.6% to 2.4% by basal area. Black cherry which makes up a larger percentage in the composition of the stand increased from 14% to 16% by numbers, and from 1.6% to 3.2% by basal area. The coniferous species in the stand increased as a result of planting.

They now make up 17% of the stand by tree numbers as against a 5% representation in 1926. The basal area changed from0.25% to 9% of the basal area of the stand. Scotch pine alone constitutes 7.5% thereof.

In contrast to other compartments, red oak has decreased its basal

area position in this stand from 43% to 33%. The numerical position of red oak remained the same. White oak, although it decreased in numbers from 2.4% to 1.3% has increased in basal area from 9% to 12%. Basswood is loosing ground in the stand composition, it decreased numerically from 32% to 24% and by basal area it decreased from 15% to 13%. Hickory also is on the decline as reflected by a basal area decreased from 9.5% to 4.5%.

The less valuable species in this compartment are evidently being replaced by more desirable species as indicated by a decrease in the numerical stand composition from 26% to 10% and from 5% to 1% by basal area. The stand differs from other compartments not only through the presence of conifers, but also by a much lower representation of ironwoods.

The above description deals with the general changes in the composition of the stand. It does not indicate the direction of change of the species themselves, nor does it show the degree of change which the various species have undergone.

Degree of Change of the Various Species.

It becomes evident at once, from a study of table 2 that the actual changes of a species are different than ~~the~~ composition chart 1 would indicate. The direction of change, and the degree of change of a species in relation to the change undergone by other species are brought out in chart 2.

Some of the results coincide with those of the previous discussion. For instance, white ash and black cherry indicate a pronounced gain in both cases. Though from a study of chart 2 it is seen that cherry has really undergone a much greater change than was indicated upon chart 1. Its numerical change amounts to a 12% gain of the sum total change undergone by the stand. Ash has gained 14% by numbers in the change of the stand. Red oak which decreased in the stand composition has actually gained 2% by numbers, though its basal area displayes a negative change of 33%. The same holds true of elm, its relative position in the stand remained the same, while it actually increased 4% by tree numbers, relative to the sum total change undergone by the stand. The most pronounced change by tree numbers resulted from planting, this amounts to a 32% increase for Scotch pine, douglas fir and white pine. The basal area change of conifers amounts to about a 16% gain.

As a group, the conifers have undergone the second greatest positive change in the stand by basal area, and it may be expected that this gain in the future will become much more pronounced. The less desirable species listed under miscellaneous species have suffered a relative deduction of 19% by numbers and 7% by basal area. The stand as a whole has increased in tree numbers by 25% and decreased in basal area by 19%. Thisbasal area decrease will soon be remedied by the growth of the younger saplings which are now much more numerous.

CHANGES WITHIN THE INDIVIDUAL SPECIES

The preceeding analysis has considered the changes in the stand in relation to the sum total stand, and in relation to other species in the stand. The following discussion treats each species separately in order to point out the changes undergone within a species in respect to diameter class changes and with regards to reproduction, and the general aggressiveness of a species in the stand.

Red Oak: Red oak displayes a gain in the sapling class which amounts to 45% of the numerical change undergone within the species. Most of the remaining diameter classes record a loss in numbers of tree per diameter class. Red oak mounted to 122% of its original number, taken as 100%, and to 63% from its original basal area. The diameter distribution of red oak extends to a 28 inch limit, however, it is a rather thin distribution when considered from the frequency of trees per diameter. Red oak still constitutes 1/3 of the basal area in the stand. Even though its basal area has been reduced considerably, the species is by no means assuming an inferior position in the stand; it is rather on the aggressive side as indicated by the increase in the sapling class.

White Oak: White oak has been reduced to 65% of its original number, while its basal area remained constant. 25% of the decrease occurred in the sapling class. There is a general loss of trees throughout the diameter classes of white oak. The species is on the decline, this is apparent from its diameter distribution which is thin and more scattered than formerly.

White Ash: White ash more than doubled its original number and increased its basal area to 163% of its former basal area. Practically all of the increase was obtained in the 1 to 4 inch diameters, above this diameter only a few trees are represented; among them a 20 inch tree which has grown at a rate of 2 inches in one decade.

Hickory: Even though hickory has reduced in basal area to 39% of the original basal area of hickory, the numerical representation of the species remained almost the same, due to an increase of hickory in the sapling class. The rather scant diameter distribution above the sapling class ceases at 13 inches, with 2 trees above that diameter.

Elm: Elm has increased in tree numbers and in basal area to 123% and 116% respectively. There has been a very consistant increase of elm to a 16 inch diameter, excepting the 1 inch class whefe a negative 21.5% change occurred. But there still is an ample representation of elm in the 1 inch diameter class. The distribution of elm is good to and 11 inch diameter, above this diameter a few single trees are found in scattered diameter classes to a 32 inch limit.

Basswood: The greatest change for basswood occurred in the 1 inch class diameter, where a negative change of 53% took place. From the 2 inch to the 12 inch diameters only positive changes took place, so that the final reduction in basswood is but little below the original representation of the species. The diameter distribution is good to an 8 inch limit, formerly the limit of fair distribution was marked by the 6 inch diameter class.

Hard Maple: Hard maple displays a large relative increase which amounts to 462% by numbers and 123% by basal area of the original stand of maple, however, maple makes up only 1.6% of the stand composition and the relative gain is therefore not so important. There are practically no trees above the sapling class.

Black Cherry: Black cherry is strongly represented in the sapling class of the stand and is still increasing in numbers. It has increased to 144% of its former number and to 164% of its former basal area. In the stand cherry makes up 16% by numbers and 3% by basal area. The diameter distribution extends to 7 inches, with most of the trees in the first 3 inch classes.

Black Walnut: Black walnut is more abundant in this compartment, it makes up 3% of the stand by tree numbers and 4% by basal area. Numerically it has mounted to 127.5% of its original number, in basal area it decreased to 85.5%. There is a good diameter distribution to a 6 inch diameter, with a few additional scattered trees in the higher diameter classes to a 21 inch limit. The larger trees appear to be growing at a rate of 2 inches per decade.

Ironwood and Blue Beech: Of the less desirable species, ironwood and blue beech display a tendency toward an increase in the numerical representation in the stand. However, the basal areas of both species have decreased; that of ironwood has been reduced to 47% of the original. Ironwood and blue beech are represented only in the first 3 diameter

classes as against a previous representation to a 7 inch and 8 inch diameter respectively. Both species combined constitute 9% of the stand by numbers and 0.9% by basal area.

Miscellaneous Species: A decided change has taken place among the miscellaneous species, which consist of dogwood, sassafras, blue ash and hawthorn. These species have been practically eliminated. There are only 6% of the original number of these trees left, and only a little over 1% of the basal area is left. The diameter distribution of these species formerly extented to 9 inches, while now it ceases at 3 inches. In the composition of the stand the position of these species has declined from 10% to 0.5%.

Coniferous Species: Of the coniferous species, scotch pine ~~is the~~ is the most abundant species. It constitutes 11% of the trees in the stand. Douglas fir makes up 6% by tree numbers, and white pine constitutes only 0.4% in the composition of the stand. Scotch pine is now represented to a 6 inch diameter as against a former 2 inch limit. And douglas fir is found to a 5 inch diameter as against a former 1 inch diameter. White pine has come into the stand since 1926 and is represented in the 2 ~~and~~ 3 inch diameters. According to the above figures, some specimen of scotch pine and douglas fir are growing at a rate of 4 inches per decade.

DIAMETER DISTRIBUTION OF THE MORE DESIRABLE SPECIES IN THE STAND

The diameter distribution is best described by means of statitics. The average diameter has changed from 3.3 inches to 3.0 inches. The standard deviation decreased from 5 to 3.7 inches, and the coefficient of variation decreased from 150% to 123%. It becomes obvious from these data that the distribution is becoming more concentrated about the mean diameter, and is approaching toward normality. There is a large proportion of small trees in this stand, between the 1 inch and 5 inch diameters. From the 6 inch diameter class to the 32 inch class the frequency of trees per diameter class is steadily decreasing, and is somewhat deficient from the 12 inch diameter upward.

As a result of a much larger number of young trees the stocking of the stand has become more open. The spacing figure changed from 21.6 to 24. The changes in the stand reduced to an acre basis are as follows: The number of trees has increased from 445 to 554 trees, the basal area decreased from 73.31 to 59.63 square feet. And the average diameter, computed from basal areas, changed from 5.5 to 4.4 inches. With the great preponderance of young trees in the stand the basal area will soon increase and the stocking of the stand will improve.

SUMMARY

A brief summary of the results of the analysis of this compartment is given to emphasize the more outstanding changes which this stand has undergone.

One of the outstanding features is the opening up of the stand as a result of the removal of 19% of the basal area of the forest.

This small basal area of the stand is a natural consequence of encouraging the growth of the large number of saplings of desirable tree species which have increased their numbers by 39%.

This gain in the sapling class is partly due to a natur-al increase from the reproduction of white ash and black cherry, and to a lesser extend to an increase of elm, maple and red oak.

A large percentage of the gain in the sapling class has resulted from the planting of coniferous species of which scotch pine is the most numerous, followed by douglas fir, and a small amount of white pine.

The less desirable species in the stand have been greatly reduced, though ironwood and blue beech are numerically on the increase in the stand. However, they are represented only in the sapling class and have little influence upon the composition of the stand. The total basal area of the less desirable species amounts to only 1% of that of the total stand.

APPENDICES

APPENDICES

LIST OF THE TREES REFERRED TO IN THIS REPORT

Common Name	Scientific Name
Ash, White	Fraxinus Americana
Ash, blue	Fraxinus Quadrangulata
Basswood	Tilia Americana
Beech, blue	Carpinus caroliniana
Butternut	Juglans cineria
Cherry, black	Prunus serotina
Dogwood	cornus florida
Douglas Fir	Pseudo-tsugs-taxifolia
Elm, American	Ulmus Americana
Hickory	Hicoria
~~Hophornbeam~~, Ironwood	Ostryavirginiana
Maple, sugar	Acer saccharum
Oak, black	Quercus velutina
Oak, northern red	Quercus borealis
Oak, white	Quercus alba
Pine, scotch	Pinus sylvestris
Pine, white	Pinus strobus
Sassafras	Sassafras varifolium
Walnut, black	Juglans nigra

COMPUTATIONS FOR COMPARTMENT I

Chart I.
Comp. I

Original Composition against Present Composition

Species	Percent of Number of Trees 1922	1932		Percent of Basal Area 1922	1932	
Red Oaks	2.41	3.44	+	26.58	28.20	+
White Oak	3.03	3.20	+	24.34	19.90	−
White Ash	6.39	11.20	+	2.06	4.57	+
Hickory	6.03	6.20	+	11.72	11.74	+
Bl. Walnut	.45	.42	−	2.18	2.59	+
Basswood	22.13	21.80	−	10.40	10.81	+
Elm	5.88	4.05	−	5.18	3.58	−
Bl. Cherry	1.12	2.86	+	.56	1.56	+
H. Maple	.28	1.35	+	.71	.72	+
Ironwood	51.60	44.16	−	15.41	15.84	+
Miscellaneous	.68	1.32	+	.86	.49	−
	100.00	100.00		100.00	100.00	

Summary

Compt. I.

Species	Stand in 1922	Stand in 1932	Increase in Number	Decrease in Number	Percent Increase	Percent Decrease	Basal A. in 1922	B.A. in 1932	Increase in BA	Decrease in BA	Percent Increase	Percent Decrease
R. Oaks	86	107	21		2.24		88.394	105.115	16.721		26.60	
Wh. Oak	108	100		8		.85	80.893	74.244		6.649		10.59
Wh. Ash	228	348	120		12.81		6.853	17.007	10.154		16.15	
Hickory	215	193		22		2.35	38.991	43.688	4.697		7.48	
Bl. Walnut	16	13		3		.32	7.308	9.664	2.356		3.74	
Basswood	792	680		112		11.97	34.548	40.236	5.678		9.04	
Elm	210	126		84		8.98	17.266	13.352		3.914		6.21
Bl. Cherry	40	89	49		5.24		1.870	5.802	3.932		6.24	
H. Maple	10	42	32		3.42		2.348	2.671	.323		.52	
Ironwood	1843	1375		468		50.00	57.352	58.779	7.427		11.81	
Miscellaneous	24	41	17		1.82		2.852	1.833		1.019		1.62
Totals	3572	3114	239	697	25.53	74.47	332.675	372.391	51.288	11.582	81.58	18.42

Decrease in No. of Trees 458 12.8%

Increase in Basal Area 39.716 11.9%

Ave. per Acre 831 724 77.366 86.581

Average DBH 4.12 4.68

Spacing Figure 20.7 19.9

Red Oak Group.

Comp. 1.

DBH Classes	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Number	Percent Gain & Loss	Basal Area 1922	Basal Area 1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	9	15	6		9.95	.054	.090	.036		.04
2	3	13	10		15.90	.066	.286	.220		.27
3	1	2	1		1.59	.049	.098	.049		.06
4	0	1	1		1.59		.087	.087		.16
5	0	0								
6	1	1				.196	.196			
7	1	1				.267	.267			
8	2	1		1	1.59	.698	.349	.349		.42
9	3	1		2	3.18	1.326	.442		.884	1.08
10	7	1		6	9.95	3.815	.545		3.270	4.00
11	12	7		5	7.94	7.920	4.620		3.300	4.04
12	8	10	2	0	3.18	6.280	7.850	1.570	0	1.92
13	7	6		1	1.59	6.454	5.532		.922	1.10
14	9	11	2		3.18	9.621	11.759	2.138		2.62
15	6	8	2		3.18	7.362	9.816	2.454		3.00
16	3	11	8		12.74	4.188	15.356	11.168		13.74
17	3	2		1	1.59	4.728	3.152		1.576	1.92
18	3	4	1	1	1.59	5.201	7.068	1.867		2.28
19	1	1				1.969	1.969			
20	1	3	2		3.18	2.181	6.543	4.362		5.33
21	0	0								
22		3	3		4.77		7.920	7.920		9.70
23	0	0								
24	1			1	1.59	3.142			3.142	3.84
25	2			2	3.18	6.820			6.820	8.34
26	1	1				3.690	3.690			
27		2	2		3.18		7.960	7.960		9.75
28		1	1		1.59		4.280	4.280		5.24
29	1			1	1.59	4.590			4.590	5.61
31		1	1		1.59		5.240	5.240		6.41
37	1			1	1.59	7.470			7.470	9.13
Totals	86	107	42	24	66.71	33.29	88.087	105.115	49.700	31.974	60.94	39.06
% of orig.		124.5	489	24.4			120	56.4	36.4			
Ave D.B.H.						13.7	13.43					

White Oak

Comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Number	Loss in Number	Percent Gain & Loss		Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain and Loss	
1	33	14		19		28.8	.198	.084		.114		.82
2	17	25	8		12.4		.374	.550	.176		.19	
3	2	7	5		7.6		.098	.343	.245		.27	
4	6	4		2		3.0	.522	.348		.174		.18
5	4	3		1		1.5	.544	.408		.134		.14
6	7	5		2		3.0	1.372	.980		.392		.42
7	6	7	1		1.5		1.602	1.869	.267		.28	
8	6	5		1		1.5	2.094	1.745		.349		.37
9	4	3		1		1.5	1.768	1.326		.442		.46
10	4	4					2.180	2.180				
11	1	3	2		3.0		.660	1.980	1.320		1.41	
12	1	3	2		3.0		.785	2.355	1.570		1.68	
13	3			3		4.6	2.766			2.766		2.98
14	3	2		1		1.5	3.207	2.138		1.069		1.15
15	1	3	2		3.0		1.227	3.681	2.454		2.64	
16		3	3		4.6			4.188	4.188		4.51	
17	1			1		1.5	1.576			1.576		1.70
18		1	1		1.5			1.767	1.767		1.90	
25												
26	1	1					3.690	3.690				
27												
28		1	1		1.5			4.280	4.280		4.61	
31	2			2		3.0	10.480	[illegible]		10.480		11.28
32	1	1					5.590	5.590				
33		2	2		3.0			11.880	11.880		12.79	
34	1			1		1.5	6.300			6.300		6.79
35		1	1		1.5			6.680	6.680		7.19	
37	2			2		3.0	14.940			14.940		16.10
38	1	1					7.880	7.880				
39		1	1		1.5			8.300	8.300		8.94	
45	1			1		1.5	11.040			11.040		11.90
Totals	108	100	29	37	44.1	55.9	80.893	74.244	43.127	49.776	46.41	53.59
Average DBH.							11.72	11.66				
% of Original		92.6	26.8	34.2				92	53.5	61.5		

Ash

Comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Numb.	Percent + Gain	Percent − Loss	Basal Area 1922	Basal Area 1932	Gain in BA.	Loss in BA.	Percent + Gain	Percent − Loss
1	115	131	16		12.7		.690	.786	.096		.68	
2	70	109	39		31.0		1.540	2.398	.858		6.20	
3	30	45	15		11.9		1.470	2.205	.735		5.33	
4	7	26	19		15.1		.623	2.314	1.691		12.30	
5	2	17	15		11.9		.272	2.312	2.040		14.80	
6	0	9	9		7.15			1.764	1.764		12.80	
7	0	5	5		3.97			1.355	1.355		9.85	
8	1	0		1		.78	.349			.349		2.52
9	1	3	2		1.58		.442	1.326	.884		6.42	
10	1	0		1		.78	.545			.545		3.95
11	0	2	2		1.58			1.320	1.320		9.58	
12												
13	1	0		1		.78	.922			.922		6.68
14												
15	0	1	1		.78			1.227	1.227		8.89	
Totals	228	348	123	3	97.66	2.34	6.853	17.007	11.970	1.816	86.85	13.15
% of original		153	54	1				248	175	27		
Ave. D.B.H.							2.35	3.00				

Hickory

Comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Numb.	Percent Gain	Percent Loss	Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain	Percent Loss
1	54	46		8		11.78	.324	.276		.048		.02
2	38	33		5		7.35	.836	.726		.110		.35
3	13	15	2		2.94		.637	.735	.098		.30	
4	21	10		11		16.18	1.827	.870		.957		2.92
5	16	17	1		1.47		2.176	2.312	.136		.43	
6	19	12		7		10.29	3.725	2.352		1.373		4.19
7	16	17	1		1.47		4.272	4.539	.267		.82	
8	15	8		7		10.29	5.235	2.792		2.443		7.45
9	3	14	11		16.18		1.326	6.188	4.862		14.80	
10	4	4					2.180	2.180				
11	6	4		2		2.94	3.960	2.640		1.320		4.02
12	5	3		2		2.94	3.925	2.355		1.570		4.78
13	1	2	1		1.47		.922	1.844	.922		2.82	
14		2	2		2.94			2.138	2.138		6.50	
15												
16	2	1		1	1.47		2.792	1.396		1.396		4.25
17		1	1			1.47		1.576	1.576		4.80	
18		1	1			1.47		1.767	1.767		5.38	
19	1			1	1.47		1.969			1.969		6.00
20		2	2			2.94		4.362	4.362		13.32	
21												
22		1	1			1.47		2.640	2.640		8.04	
23	1			1	1.47		2.885			2.885		8.81
Totals	215	193	23	45	30.88	69.12	38.991	43.688	18.768	14.071	57.21	42.79
% of orig.		89.8	10.7	20.9				112	48.1	36.1		
Ave. DBH							5.77	6.4				

Basswood

Comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Numb.	Percent Gain & Loss	Basal Area 1922	Basal Area 1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	342	203		139	37.00	2.052	1.218		.834	2.33
2	273	172		101	26.84	6.006	3.784		2.222	6.18
3	107	127	20		5.33	5.243	6.223	.980		2.74
4	42	94	52		13.85	3.654	8.178	4.524		12.70
5	11	39	28		7.45	1.496	5.304	3.808		10.68
6	5	18	13		3.36	.980	3.528	2.548		7.14
7	2	12	10		2.68	.534	3.204	2.670		7.48
8	1	7	6		1.60	.349	2.443	2.094		5.88
9	2	3	1		.27	.884	.884			
10	2	2								
13	0	1	1		.27		.922	.922		2.58
16	1	1				1.396	1.396			
19	1	0		1		.27	1.969		1.969	5.52
23	1			1		.27	2.885		2.885	8.08
24		1	1	1	.27		3.142	3.142		8.81
25	1			1		.27	3.410		3.410	9.54
26	1			1		.27	3.690		3.690	10.34
Totals	792	680	132	244	35.08	64.92	34.548	40.236	20.688	15.010	58.01	41.99
% of Original		86	16.8	30.8			116.5	60	43.5	
Ave. DBH.						2.81	3.30			

Elm

Comp. I.

DBH Class	No. of Trees 1922	1932	Gain in Numb.	Loss in Number	Percent Gain	Loss	Basal Area 1922	1932	Gain in Bas. A.	Loss in BA	Percent Gain	Loss
1	68	30		38		33.3	.408	.180		.228		1.41
2	56	21		35		30.7	1.232	.426		.806		5.00
3	43	24		19		16.7	2.107	1.176		.931		5.78
4	19	18		1		.89	1.653	1.566		.081		.54
5	11	11					1.496	1.496				
6	3	10	7		6.15		.588	1.960	1.372		8.52	
7	1	5	4		3.51		.267	1.335	1.068		6.63	
8	2	1		1		.89	.698	.349		.349		2.15
9	2	0		2		1.73	.884			.884		5.49
10	1	2	1		.89		.545	1.090	.545		3.38	
11	1	2	1		.89		.660	1.320	.660		4.10	
14	2			2		1.73	2.138			2.138		13.30
15		2	2		1.73			2.454	2.454		15.20	
29	1			1		.89	4.590			4.590		28.50
Totals	210	126	15	99	13.17	86.83	17.266	13.352	6.099	10.013	37.83	62.17
% of original		60	7.15	47.15				77.2	35.1	58.3		
Ave. DBH.							3.87	4.4				

Walnut.

comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1922	Basal Area 1932	Gain in BA.	Loss in BA.	Percent Gain	Percent Loss
1	2	1		1		6.67	.012	.006		.006		.05
2	2	1		1		6.67	.044	.022		.022		.17
3	1	0		1		6.67	.049			.049		.38
4	2	0		2		13.32	.174			.174		1.35
5	1	1					.136	.136				
6	1	1					.196	.196				
7	0	2	2		13.32			.534	.534		4.14	
8	1	0		1		6.67	.349			.349		2.70
9	2	2					.884	.884				
10												
11	0	1	1		6.67			.660	.660		5.11	
12	1	1					.785	.785				
13	1			1		6.67	.922			.922		7.14
16	0	1	1		6.67			1.396	1.396		10.80	
17	1	0		1		6.67	1.576			1.576		12.20
20	1	0		1		6.67	2.181			2.181		16.90
21	0	1	1		6.67			2.405	2.405		18.65	
22	0	1	1		6.67			2.640	2.640		20.41	
Totals	16	13	6	9	40.0	60.0	7.308	9.664	7.635	5.279	59.11	40.89
% of Original		81.3	37.6	56.3				132	105	73		
Ave. D.B.H.							9.15	11.67				

Black Cherry.

Comp. I.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Number	Loss in Number	Percent Gain & Loss		Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain & Loss	
1	16	50	34		64.20		.096	.300	.204		3.38	
2	16	19	3		5.66		.352	.418	.066		1.09	
3	4	7	3		5.66		.196	.343	.147		2.44	
4	2	5	3		5.66		.174	.435	.261		4.33	
5		2	2		3.75			.272	.272		4.51	
6		4	4		7.55			.784	.784		13.00	
7	1			1		1.88	.267			.267		4.43
12	1			1		1.88	.785			.785		13.00
14		1	1		1.88			1.069	1.069		17.70	
20		1	1		1.88			2.181	2.181		36.12	
Totals	40	89	51	2	96.24	3.76	1.870	5.802	4.984	1.052	82.57	17.43
% of Orig.		222	127	5				310	266 (3.932)	56		
Ave. DBH							2.9	3.45				

Hard Maple.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Numb.	Percent Gain & Loss		Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain & Loss	
1	6	24	18		47.40		.036	.144	.108		2.2	
2	1	13	12		31.60		.022	.286	.264		5.4	
3	0	1	1		2.63			.049	.049		1.0	
4	0	2	2		5.22			.174	.174		3.5	
8	1			1		2.63	.349			.349		7.1
9		1	1		2.63			.442	.442		9.0	
10	1			1		2.63	.545			.545		11.1
16	1			1		2.63	1.396			1.396		28.5
17		1	1		2.63			1.576	1.576		32.2	
Totals	10	42	35	3	92.11	7.89	2.348	2.671	2.613 (.323)	2.290	53.3	46.7
% of Orig.		420	350	30				114	111	98		
Ave. DBH.							6.56	3.4				

Changes in Diameter Classes

Iron wood

Comp. 1

DBH Classes	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	635	361		274	31.45	3.810	2.166		1.644	5.65
2	708	412		296	45.45	15.576	9.064		6.512	22.40
3	353	304		49	5.53	17.297	14.896		2.401	8.26
4	122	191	69		7.92	10614	16617	6.003		20.65
5	19	86	67		7.68	2.584	11.696	9.112		31.38
6	3	19	16		1.85	.588	3.724	3.136		10.75
7	2	1		1	.12	.534	.267		.267	.91
8	1	1				.349	.349			
Totals	1843	1375	152	620	17.45	82.55	51.352	58.779	18.251	10.824	62.78	37.22
% of original		74	8.25	34.25			114.5	35.5	21.0			
Ave. D.B.H.						2.25	2.80					

Miscellaneous Species.

DBH Classes	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	9	31	22		59.5	.054	.186	.132		3.02
2	9	5		4	10.8	.198	.110		.088	2.20
3		1	1		2.7		.049	.049		1.00
4		3	3		8.1		.261	.261		6.00
5	4			4	10.8	.544			.544	12.50
11	1			1	2.7	.660			.660	15.10
15		1	1		2.7		1.227	1.227		28.18
16	1			1	2.7	1.396			1.396	32.00
Totals	24	41	27	10	73.0	27.0	2.852	1.833	1.669	2.688	38.20	61.80
% of original		171	113	42			64	58.5	94.5			
Average DBH						4.67	2.73					

A-4
Comp. I

Diameter Distribution of the More Desirable Species.

D.B.H. Class	No. of Trees. Stand in 1922	Stand in 1932
1	645	514
2	478	407
3	201	228
4	99	160
5	45	90
6	46	60
7	27	49
8	29	22
9	17	27
10	18	13
11	21	19
12	16	17
13	13	9
14	14	16
15	7	14
16	6	17
17	5	4
18	3	6
19	3	1
20	2	6
21	0	1
22	0	5
23	2	0
24	1	1
25	3	0
26	3	2
27	0	2
28	0	2
29	2	0
30	0	0
31	2	1
32	1	1
33		2
34		0
35		1
37	3	
38		1
39		1
45	1	
Total	1623	1699

	1922	1932
Mean Diameter	3.18	3.82
Standard deviation	4.19	4.42
Coefficient of Variation	132%	108%

COMPUTATIONS FOR COMPARTMENT IV

Changes in Diameters per Species.

Comp. IV.

Species	Ave. DBH 1920	Ave. DBH 1935	Gained	Reduced	Percent Increase	Percent Decrease
Maple	4.98	4.26		.72		
Basswood	6.85	5.23		1.62		
Wh. Ash	5.60	3.70		1.90		
N. R. Oak	13.66	15.14	1.48			
Wh. Oak	8.44	10.70	2.26			
Hickory	6.63	8.20	1.63			
Elm	4.05	4.55	.50			
Walnut	13.47	14.03	.56			
Bl. Cherry	6.97	5.55		1.42		
Sassafras	1.60	6.00	4.40			
Ironwood	2.15	3.38	1.23			
Blue Beech	1.60	1.65	.05			
Dogwood		1.46	1.46			

Original Composition against Present Composition.

Species	Percent of Number of Trees		Percent of Basal Area	
	1920	1935	1920	1935
H. Maple	5.44	17.00	6.55	11.25
Basswood	4.68	6.90	10.85	6.85
Wh. Ash	4.44	13.55	6.75	6.79
NR. Oak	2.70	3.85	24.45	32.02
Wh O	3.49	2.82	12.08	11.67
Hickory	9.33	6.55	16.98	15.99
Elm	9.03	6.44	7.05	4.63
Walnut	.31	.43	2.68	3.06
Bl Cherry	.31	.64	.75	.76
Sassafras	.07	.04	.01	.06
Ironwood	53.81	36.80	11.00	6.43
Blue Beech	6.39	3.98	.85	.41
Dogwood	0	1.00	00	.08
	100.00	100.00	100.00	100.00

Summary

Comp. IV

Species	Stand in 1920	Stand in 1935	Increase in Number	Decrease in Number	Percent Increase and Decrease		Basal Area 1920	Basal Area 1935	Increase in Bas. Area	Decrease in B.A	Percent Increase and Decrease	
Maple	159	397	238		15.20		21.526	39.476	17.950		20.15	
Basswood	137	161	24		1.52		35.595	24.054		11.541		13.00
Wh. Ash	130	316	186		11.88		22.136	23.815	1.679		1.87	
Red Oaks	79	90	11		.72		80.358	112.373	32.015		36.00	
Wh. Oak	102	66		36		2.30	39.616	41.242	1.626		1.82	
Hickory	273	153		120		7.65	55.678	56.078	.400		.44	
Elm	264	150		114		7.26	23.121	16.569		6.552		7.36
Walnut	9	10	1		.06		8.905	10.726	1.821		2.03	
Bl Cherry	9	15	6		.38		2.385	2.485	.100		.11	
Sassafras	2	1		1		.06	.028	.196	.168		.18	
Ironwood	1574	860		714	~~45.50~~	45.50	36.218	22.570		13.648		15.34
Blue Beech	187	93		94	~~6.00~~	6.00	2.694	1.430		1.264		1.41
Dogwood	0	23	23		~~.47~~	~~.47~~	0	.266	.266		.29	
Totals	2925	2335	489	1079	81.26	18.74	328.260	351.280	56.025	33.005	72.89	37.11
					31.23	70.94						

Decrease in Number of Trees 590 — 20.2%

Increase in Basal Area 23.020 — 7%

Average per Acre	680	543	114	251			76.349	81.693	13.029	7.722		

Decrease in No. of Trees per Acre 137 — Increase in B.A. per Acre 5.353

Average D.B.H.	4.5	5.3
Spacing Figure	21.18	20.46

Changes in Diameter Classes
Northern Red Oak

Comp. IV

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss by Number	Percent Gain and Loss	Basal Area 1920	Basal Area 1935	Gain in B.A.	Loss in B.A.	Percent Gain and Loss
1	1	5	4		5.2	.006	.030	.024		.02
2	2	5	3		3.9	.044	.110	.066		.08
3	0	4	4		5.2		.196	.196		.20
4										
5	1	0		1	1.3	.136			.136	.15
6	1	0		1	1.3	.196			.196	.20
7	2	1		1	1.3	.534	.267		.267	.30
8	5	0		5	6.5	1.745			1.745	1.85
9	5	0		5	6.5	2.210			2.210	2.35
10	4	3		1	1.3	2.180	1.635		.545	.60
11	7	7				4.620	4.620			
12	5	6	1		1.3	3.925	4.710	.785		.85
13	13	3		10	13.0	11.986	2.766		9.220	9.80
14	3	9	6		7.8	3.207	9.621	6.414		6.80
15	13	5		8	10.4	15.951	6.135		9.816	10.05
16	5	6	1		1.3	6.980	8.376	1.396		1.50
17	6	6				9.456	9.456			
18	2	6	4		5.2	3.534	10.602	7.068		7.50
19	2	10	8		10.4	3.938	19.690	15.752		16.80
20	0	7	7		9.0		15.167	15.167		16.10
21	0	1	1		1.3		2.405	2.405		2.55
22	1	4	3		3.9	2.640	10.560	7.920		8.40
23	0	1	1		1.3		2.885	2.885		3.05
24	0	1	1		1.3		3.142	3.142		3.35
36	1	0		1	1.3	7.070			7.070	7.50
Totals	79	90	44	33	57.1 42.9	80.358	112.373	63.220	31.205	67.20 32.80
Diff.		+11					+32.015			
% of Original		114	55.6	41.6			140	78.5	38.5	
Ave. DBH.						13.66	15.14			

Changes in Diameter Classes
White Oak

Comp. IV.

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain+Loss		Basal Area 1920	Basal Area 1935	Gain in BA	Loss in BA	Percent Gain+Loss	
1	8	2		6		9.1	.048	.012		.036		.09
2	5	7	2		3.2		.110	.154	.014		.03	
3	8	1		7		10.6	.392	.049		.343		.81
4	13	3		10		15.0	1.131	.261		.870		2.07
5	11	5		6		9.1	1.496	.680		.816		1.94
6	6	2		4		6.0	1.176	.392		.784		1.86
7	13	4		9		13.7	3.471	1.068		2.403		5.71
8	9	8		1		1.5	3.141	2.792		.349		.83
9	6	5		1		1.5	2.652	2.210		.442		1.05
10	5	6	1		1.5		2.725	3.270	.545		1.30	
11	6	6					3.960	3.960				
12	5	1		4		6.0	3.925	.785		3.140		7.45
13	2	5	3		4.5		1.844	4.610	2.766		6.57	
14	1	3	2		3.3		1.069	3.207	2.138		5.07	
15	0	3	3		4.5			3.881	3.881		9.22	
16	1	2	1		1.5		1.396	2.792	1.396		3.31	
17												
18												
19	0	1	1		1.5			1.969	1.969		4.67	
25	1	0		1		1.5	3.410	.340	3.410	3.410		8.10
26	1	0		1		1.5	3.690		3.690	3.690		8.76
27	1	0		1		1.5	3.980		3.980	3.980		9.44
28	0	1	1		1.5			4.280	4.280		10.02	
29												
30	0	1	1		1.5			4.910	4.910		11.70	
Totals	102	66	15	51	23.0	77.0	39.616	41.242	21.899	20.263	51.89	48.11
% of orig.		64.7	14.7	50				104	55.3	51.3		
Ave. DBH							8.44	10.7				

Changes in Diameter Classes by Species.

Maple.

Comp. IV.

D.B.H. Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain and Loss		Basal Area 1920	Basal Area 1935	Gain in Basal A.	Loss in B. A.	Percent Gain & Loss	
1	90	164	74		28.96		.540	.984	.444		1.11	
2	33	122	89		34.66		.726	2.684	1.958		4.90	
3	12	57	45		17.66		.588	2.793	2.205		5.52	
4	1	17	16		6.25		.087	1.479	1.392		3.49	
5	2	7	5		1.95		.272	.952	.680		1.72	
6	0	8	8		3.12			1.568	1.568		3.90	
7	4	2		2		.77	1.068	.534		.534		1.34
8	1	2	1		.39		.349	.698	.349		.87	
9	1	1					.442	.442				
10	5	2		3		1.17	2.725	1.090		1.635		4.09
11	1	3	2		.78		.660	1.980	1.320		3.28	
12	1	2	1		.39		.785	1.570	.785		1.95	
13	2	1		1		.39	1.844	.922		.922		2.30
14	2	2					2.138	2.138				
15												
16	1	1					1.396	1.396				
17	1			1		.39	1.576			1.576		3.95
18		1	1		.39			1.767	1.767		4.43	
19		1	1		.39			1.969	1.969		4.90	
20												
21												
22	1			1		.39	2.640			2.640		6.60
23												
24												
25		3	3		1.17			10.230	10.230		25.70	
26	1			1		.39	3.690			3.690		9.25
27												
28		1	1		.39			4.280	4.280		10.70	
Totals	159	397	247	9	96.5	3.5	21.526	39.476	28.947	10.997	72.47	27.53
Diff.		238	238					17.950	17.950			
% of Original		249.9	1566	5.66				183.8	134.5	51.0		
Ave. DBH.	–	–	–	–	–	–	–	–	4.98	4.26		

Changes in Diameter Classes
White Ash

Comp. IV

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain and Loss	Basal Area 1920	Basal Area 1935	Gain in B.A.	Loss in B.A.	Percent Gain & Loss
1	77	134	57		27.40	.467	.704	.237		.75
2	20	105	85		40.90	.440	2.310	1.870		6.20
3	12	38	26		12.50	.588	1.862	1.274		4.25
4	1	10	9		4.32	.087	.870	.783		2.50
5	1	11	10		4.80	.136	1.496	1.360		4.40
6	1	2	1		.48	.196	.392	.196		.60
7	0	3	3		1.44		.801	.801		2.60
8	1	2	1		.48	.349	.698	.349		1.10
9	1	0		1	.48	.442			.442	1.40
10	1	2	1		.48	.545	1.090	.545		1.75 2.
11	1	0		1	.48	.660			.660	2.10
12	3	0		3	1.44	2.355			2.355	7.55
13	3	2		1	.48	2.766	1.844		.922	2.90
14	2	1		1	.48	2.138	1.069		1.069	3.40
15	1	0		1	.48	1.227			1.227	3.90
16	0	1	1		.48		1.396	1.396		4.50
17	2	0		2	.96	3.152			3.152	10.05
18	1	1				1.767	1.767			
19	0	1	1		.48		1.969	1.969		6.55
20	1	0		1	.48	2.181			2.181	7.25
21	0	1	1		.48		2.405	2.405		7.75
22	1	1				2.640			2.640	8.50
23	0	0								
24	0	1	1		.48		3.142	3.142		10.00
Totals	130	316	197	11	94.72 5.28	22.136	23.815	16.327	14.648	52.95 47.05
% of orig.		243.5	151.9	8.4			107.8	73.9	66.1	
Ave. DBH						560	3.70			

Changes in Diameter Classes within the Species

Basswood

Comp. IV.

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1920	Basal Area 1935	Gain in Bas A.	Loss in B A.	Percent Gain	Percent Loss
1	40	39		1		2.2	.240	.234	.006			.02
2	41	49	8		17.5		.902	1.078	.176		.42	
3	15	24	9		19.6		.735	1.176	.441		1.04	
4	9	8		1		2.2	.783	.696		.087		.20
5	6	7	1		2.2		.816	.952	.136		.32	
6	8	7		1		2.2	1.568	1.372		.196		.47
7	5	7	2		4.4		1.335	1.869	.534		1.26	
8	2	5	3		6.5		.698	1.745	1.047		2.47	
9	1	6	5		10.2		.442	2.652	2.210		5.22	
10	1	2	1		2.2		.545	1.090	.545		1.29	
11	0	1	1		2.2			.660	.660		1.56	
12	1	1					.785	.785				
13	0	2	2		4.4			1.844	1.844		4.35	
14	0	1	1		2.2			1.069	1.069		2.43	
15												
16												
17												
18	1	0		1		2.2	1.767			1.767		4.16
19	1	0		1		2.2	1.969			1.969		4.64
20												
21												
22	1	0		1		2.2	2.640			2.640		6.22
23	2	0		2		4.4	5.770			5.770		13.62
24	0	1	1		2.2			3.142	3.142		7.42	
25												
26	0	1	1		2.2			3.690	3.690		8.69	
27												
28	2	0		2		4.4	8.560			8.560		20.20
33	1	0		1		2.2	5.940			5.940		14.00
Totals	137	161	35	11	75.8	24.2	35.595	24.054	15.494	26.935	36.47	63.53
% of original		117.6	25.6	8.0				67.75	43.25	75.75		
Ave. DBH.							6.85	5.23				

Changes in Diameter Classes

Hickory

Comp. IV.

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Numb.	Loss in No.	Percent Gain & Loss	Basal Area 1920	Basal Area 1935	Gain in B.A.	Loss in B.A.	Percent Gain & Loss
1	91	20		71	44.41	.546	.120		.426	1.20
2	28	20		8	5.00	.616	.440		.176	.49
3	19	10		9	5.63	.931	.490		.441	1.24
4	23	8		15	9.37	2.001	.696		1.305	3.66
5	15	10		5	3.12	2.040	1.360		.680	1.92
6	15	6		9	5.63	2.940	1.176		1.764	4.94
7	14	8		6	3.75	3.738	2.016		1.722	4.84
8	24	14		10	6.25	8.376	4.886		3.490	9.76
9	15	13		2	1.25	6.630	5.746		.884	2.40
10	8	14	6		3.75	4.360	7.630	3.270		9.16
11	6	10	4		2.50	3.960	6.600	2.640		7.40
12	4	5	1		.62	3.140	3.925	.785		2.20
13	1	6	5		3.12	.922	5.532	4.610		12.90
14	5	2		3	1.88	5.345	2.138		3.207	9.00
15		2	2		1.25		2.454	2.454		6.87
16		1	1		.62		1.396	1.396		4.00
17	1			1	.62	1.576			1.576	4.42
18	1	1				1.767	1.767			
19	1			1	.62	1.969			1.969	5.52
20	1	1				2.181	2.181			
21										
22	1	1				2.640	2.640			
23		1	1		.62		2.885	2.885		8.08
24										
Totals	273	153	20	140	12.48	87.52	55.678	56.078	18.040	17.640	48.05	51.95
% of original		56	7.3	51.3			100.7	32.4	31.7			
Ave. DBH						6.63	8.20					

Changes in Diameter Classes

Elm.

Comp. IV.

DBH Class.	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1920	Basal Area 1935	Gain in BA	Loss in BA	Percent Gain	Percent Loss
1	93	23		70		49.30	.558	.138		.420		2.53
2	89	41		48		33.80	1.958	.902		1.056		6.36
3	38	35		3		2.12	1.862	1.715		.147		.85
4	17	19	2		1.41		1.479	1.653	.174		1.05	
5	12	8		4		2.82	1.632	1.088		.544		3.28
6	5	7	2		1.41		.980	1.372	.392		2.36	
7	1	4	3		2.12		.267	1.068	.801		4.82	
8	1	5	4		2.82		.349	1.445	1.096		6.60	
9	1	2	1		.70		.442	.884	.442		2.66	
10		1	1		.70			.545	.545		3.28	
11	1	1					.660	.660				
12												
13												
14	1	1					1.069	1.069				
15	2	2					2.454	2.454				
16												
17		1	1		.70			1.576	1.576		9.50	
18												
19												
20	1	0		1		.70	2.181			2.181		13.11
21												
22	1	0		1		.70	2.640			2.640		15.90
29	1	0		1		.70	4.590			4.590		27.70
Totals	264	150	14	128	9.86	90.14	23.121	16.569	5.026	11.578	30.27	69.73
% of orig.		56.8	53	48.5				72.0	21.7	50.3		
Ave. DBH							4.05	4.55				

Changes in Diameter Classes.
Walnut.

Comp. IV.

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1920	Basal Area 1935	Gain in B.A.	Loss in B.A.	Percent Gain	Percent Loss
1	2	1		1		5.88	.012	.006		.006		.03
2												
3	0	1	1		5.88			.049	.049		.25	
4												
5	1	0		1		5.88	.136			.136		.70
6	0	1	1		5.88			.196	.196		1.00	
7												
8	0	1	1		5.88			.349	.349		1.78	
9	2	0		2		11.78	.884			.884		4.50
10	0	1	1		5.88			.545	.545		2.78	
11												
12	1	0		1		5.88	.785			.785		4.00
13	1	0		1		5.88	.922			.922		4.70
14	0	2	2		11.78			2.138	2.138		10.90	
15												
16	0	1	1		5.88			1.396	1.396		7.12	
17	1	0		1		5.88	1.576			1.576		8.03
18	0	1	1		5.88			1.767	1.767		9.00	
28	0	1	1		5.88			4.280	4.280		21.81	
29	1	0		1		5.88	4.590			4.590		23.40
Totals	9	10	9	8	52.94	41.16	8.905	10.726	10.720	8.899	54.64	45.36
% of original		111	100	89				121				
Ave. D.B.H.							13.47	14.03				

Changes in Diameter Classes.

Cherry

Comp. IV

DBH Class	No. of Trees 1920	No. of Trees 1935	Gain in Numb.	Loss in Number	Percent Gain & Loss		Basal Area 1920	Basal Area 1935	Gain in B.A.	Loss in B.A.	Percent Gain & Loss	
1	2	5	3		30		.012	.030	.018		.70	
2	3	6	3		30		.066	.132	.066		2.65	
3	1	1					.049	.049				
4												
5	0	1	1		10			.136	.136		5.50	
6												
7	1	0		1		10	.267			.267		10.75
13	1	0		1		10	.922			.922		37.30
14	1	2	1		10		1.069	2.138	1.069		43.10	
Totals	9	15	8	2	80	20	2.385	2.485	1.289	1.189	51.95	48.05
% of origin.		167	89	22				104	54	50		
Ave. DBH.							6.97	5.55				

Sassafras

DBH	No. of Trees 1920	No. of Trees 1930	Gain in Number	Loss in Number	Percent Gain & Loss		Basal Area 1920	Basal Area 1935	Gain in BA	Loss in BA	Percent Gain & Loss	
1	1			1	33	33.3	.006			.006		2.68
2	1			1		33.3	.022			.022		9.82
6		1	1		33.3			.196	.196		87.50	
Totals	2	1	1	2	33.3	66.6	.028	.196	.196	.028	87.50	12.50
% of origin.		50	50	200				700	700	100		
Ave. DBH.							1.6	6.0				

Changes in Diameter Classes

Iron Wood

Comp. IV.

DBH Classes	No. of Trees 1920	1935	Gain in No. of Trees	Loss in Numb.	Percent Gain	Loss	Basal Area 1920	1935	Gain in B.A.	Loss in B.A.	Percent Gain & Loss
1	716	274		442	61.90		4.296	1.644		2.652	19.42
2	627	380		247	34.60		13.794	8.360		5.434	39.80
3	160	158		2	.28		7.840	7.742		.098	.72
4	39	36		3	.42		3.393	3.132		.261	1.91
5	18	11		7	.98		2.448	1.496		.952	6.98
6	7	1		6	.84		1.372	.196		1.176	8.62
7	2			2	.28		.534			.534	3.92
8	1			1	.14		.349			.349	2.56
9	1			1	.14		.442			.442	3.24
10	2			2	.28		1.090			1.090	7.99
11	1			1	.14		.660			.660	4.84
Totals	1574	860		714	100		36.218	22.570		13.648	100
% of orig.		54		46				62.3		37.7	
Ave. DBH.							2.15	3.38			

Blue Beech.

DBH Class	No. of Trees 1920	1935	Gain in Numb.	Loss in Number	Percent Gain	Loss	Basal Area 1920	1935	Gain in BA	Loss in BA	Percent Gain & Loss
1	108	51		57	60.6		.648	.306		.342	27.0
2	69	36		33	35.2		1.518	.792		.726	57.5
3	9	5		4	4.2		.441	.245		.196	15.5
4	1	1					.087	.087			
Totals	187	93		94	100		2.694	1.430		1.264	100
% of orig.		49.8		50.2				53.2		46.8	
Ave. DBH.							1.6	1.65			

Dogwood

DBH Class	No. of Trees 1920	1935	Gain in Numb.	Loss in Numb.	Percent Gain	Loss	Basal Area 1920	1935	Gain in BA	Loss in BA	Perent Gain & Loss
1		15	15		65.2			.090	.090		
2		8	8		34.8			.176	.176		
Totals		23	23		100.0			.266	.266		
Ave. DBH.								1.46			

Diameter Distribution of The More Desirable Species.

DBH Class	Stand in 1920	Stand in 1935
1	404	393
2	221	355
3	105	171
4	64	65
5	49	49
6	36	33
7	40	29
8	43	37
9	32	27
10	24	31
11	22	28
12	20	15
13	23	19
14	15	23
15	16	12
16	7	13
17	11	7
18	5	10
19	4	13
20	3	8
21	0	2
22	6	6
23	2	2
24		3
25	1	3
26	2	1
27	1	
28	2	2
29	2	
30		1
31	1	
32		
33		
34		
35		
36	1	
Total	1162	1357

Average diameter in 1920	4.26 inches
Average diameter in 1935	4.42 inches
Standard deviation in 1920	5.0 inches
Standard deviation in 1935	4.97 inches
Coefficient of Variation in 1920	118%
Coefficient of Variation in 1935	112%
Percent Increase of Desirable Species.	8.6%

COMPUTATIONS FOR COMPARTMENT VI

Chart No I

Original Composition against Present Composition.

Comp. 6.

Species	Percent of Number of Trees		Percent of Basal Area	
	1922	1932	1922	1932
Wh. Oak	11.28	5.10	20.60	15.36
Red Oaks	17.76	10.88	43.00	48.90
H. Maple	9.18	6.18	14.64	13.71
Wh. Ash	2.10	4.92 ✓	1.57	2.36
Hickory	6.30	3.12	11.60	11.82
Black Walnut	.59	.18	.91	.91
Elm	2.49	4.51 ✓	.68	.69
Bl. Cherry	.46	.45	.72	.68
Basswood	.39	1.44 ✓	.02	.16
Ironwood	44.00	59.80	5.17	5.24
Blue Beech	.52	.63	.03	.05
Dogwood	4.13	2.75	.94	.12
Crataegus	.79		.12	
Sassafras		.04		
Totals	100.00	100.00	100.00	100.00

Summary
Showing the Percent Changes by Species in Number of Trees and by Basal Area.

Comp. 6

Species	Stand in 1922	Stand in 1932	Increase in Number	Decrease in Number	Percent Increase	Percent Decrease	Basal Area in 1922	Basal Area in 1932	Increase in BA	Decrease in BA	Percent Increase	Percent Decrease
White Oak	172	113		59		6.10	75.868	58.452		17.416		30.05
Red Oak Group	271	241		30		3.11	158.068	185.961	27.893		48.25	
H. Maple	140	137		3		.31	53.811	52.209	1.602			2.77
Wh. Ash	32	109	77		7.98		5.759	9.025	3.266		5.65	
Hickory	96	69		27		2.79	42.625	44.947	2.322		4.02	
Black Walnut	9	4		5		.52	3.339	3.502	.163		.28	
Elm	38	100	62		642		2.521	2.616	.095		.17	
Bl. Cherry	7	10	3		.31		2.672	2.588		.084		.15
Basswood	6	32	26		2.69		.084	.622	.538		.93	
Ironwood	672	1325	653		67.60		19.026	19.937	.911		1.58	
Blue Beech	8	14	6		.62		.107	.180	.073		.13	
Dogwood	63	61		2		.21	3.475	.462		3.013		5.24
Crataegus	12			12		1.24	.443			.443		.77
Sassafras		1	1		.10			.006	.006		.01	
Totals	1526	2216	828	138	85.72	14.28	367.798	380.507	35.267	22.558	61.02	38.98

Actual increase in Number of trees 690 — 45.3%

Increase in Basal Area 12.709 — 3.5%

Aver. per Acre	355	515	192	32			85.534	88.49
Average DBH.							6.64	5.72
Spacing Figure							20.02	19.68

C III c

Red Oak Groups.

Comp. 6

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1922	1932	Gain in B.A.	Loss in BA.	Percent Gain	Percent Loss
1		8	8		5.13		.048	.048		.05		
2		6	6		3.84		.132	.132		.14		
3	1			1		.64	.049			.049		.05
4	10			10		6.42	.870			.870		.94
5	11	1		10		6.42	1.496	.136		1.360		1.47
6	14	1		13		8.33	2.744	.196		2.548		2.74
7	23	10		13		8.33	6.141	2.670	~~3.471~~	3.471		3.75
8	35	16		19		12.20	12.215	5.584		6.631		7.16
9	39	22		17		10.90	17.238	9.724		7.514		8.12
10	39	34		5		3.20	21.255	18.530		2.725		2.95
11	26	34	8		5.13		17.160	22.440	5.280		5.70	
12	18	27	9		5.77		14.130	21.195	7.065		7.64	
13	23	20		3		1.92	21.206	18.440		2.766		2.99
14	11	17	6		3.84		11.759	18.173	6.414		6.94	
15	7	18	11		7.05		8.589	22.086	13.497		14.58	
16	6	11	5		3.20		8.376	15.356	6.980		7.54	
17	3	9	6		3.84		4.728	14.184	9.456		10.20	
18	2	1		1		.64	3.534	1.767		1.767		1.92
19	2	2					3.938	3.938				
20												
21		2	2		1.28			4.810	4.810		5.19	
22	1			1		.64	2.640			2.640		2.86
23												
24		1	1		.64			3.142	3.142		3.39	
25		1	1		.64			3.410	3.410		3.68	
Totals	271	241	63	93	40.36	59.64	158.068	185.961	60.234	32.341	65.05	34.95
% of orig.		89	23	34				118	38	20		
Ave. DBH.							10.35	11.9				

White Oak

Comp. 6.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Numb.	Loss in Numb.	Percent Gain	Percent Loss	Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain	Percent Loss
1	1	2	1		·88		·006	·012	·006		·01	
2	4	1		3		2.66	·088	·022		·066		·09
3	17	3		14		12.40	·833	·147		·686		·91
4	28	6		22		19.48	2.436	·502		1.934		2.56
5	25	8		17		15.07	3.400	1.088		2.312		3.06
6	34	18		16		14.17	6.664	3.528		3.136		4.15
7	21	27	6		5.31		5.607	7.209	1.602		2.12	
8	7	13	6		5.31		2.443	4.537	2.094		2.77	
9	10	8		2		1.77	4.420	3.536		·884		1.17
10	6	10	4		3.58		3.720	5.450	1.730		2.29	
11	3	4	1		·88		1.980	2.640	·660		·87	
12	2	2					1.570	1.570				
13	1	4	3		2.66		·922	3.688	2.766		3.66	
14		1	1		·88			1.069	1.069		1.41	
15		1	1		·88			1.227	1.227		1.62	
16	2			2		1.77	2.792			2.792		3.69
20	2			2		1.77	4.362			4.362		5.77
21	1			1		·88	2.405			2.405		3.18
22	1			1		·88	2.640			2.640		3.49
23		1	1		·88			2.885	2.885		3.82	
24		1	1		·88			3.142	3.142		4.16	
25	1			1		·88	3.410			3.410		4.51
26	2			2		1.77	7.380			7.380		9.76
27	1			1		·88	3.980			3.986		5.27
28	1	1					4.280	4.280				
29	1			1		·88	4.590			4.590		6.07
31		1	1		·88			5.240	5.240		6.88	
33	1			1		·88	5.940			5.940		7.87
35		1	1		·88			6.680	6.680		8.84	
Totals	172	113	27	86	23.90	76.10	75.868	58.452	29.101	46.517	38.45	71.55
% of Original		65.7	15.7	50.0				77.0	38.4	61.4		
Ave. DBH.							9.0	9.74				

White Ash.

Comp. 6

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in B.A	Loss in B.A	Percent Gain & Loss
1	18	71	53		59.54	.108	.426	.318		3.48
2	4	21	17		19.12	.088	.862	.774		8.48
3		8	8		9.00		.392	.392		4.29
4										
5		1	1		1.12		.136	.136		1.49
6	1			1	1.12	.196			.196	2.15
7	2	1		1	1.12	.534	.267		.267	2.93
8										
9	2			2	2.25	.884			.884	9.70
10		1	1		1.12		.545	.545		5.98
11	2	1		1	1.12	1.320	.660		.660	7.24
12	1	1				.785	.785			
13	2	1		1	1.12	1.844	.922		.922	10.12
15		2	2		2.25		2.454	2.454		26.86
17		1	1		1.12		1.576	1.576		17.28
Totals	32	109	83	6	93.27	6.73	5.759	9.025	6.195	2.929	67.86	32.14
% of Original		341	260	19			157	108	51			
Ave. DBH.							5.75	3.90				

Class III e

Hickory

Comp. 6.

DBH Class	No. of Trees 1922	No. of Trees 1932	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1922	Basal Area 1932	Gain in B.A.	Loss in B.A.	Percent Gain	Percent Loss
1	5	5					.030	.030				
2	7	1		6		8.45	.154	.022		.132		.30
3	5	2		3		4.23	.245	.098		.147		.33
4	14	2		12		16.90	1.218	.174		1.044		2.34
5	10	5		5		7.04	1.360	.680		.680		1.53
6	8	3		5		7.04	1.568	.588		.980		2.21
7	11	8		3		4.22	2.937	2.136		.801		1.80
8	5	12	7		9.85		1.745	4.188	2.443		5.50	
9	1	3	2		2.82		.442	1.326	.884		1.99	
10	3	3				4.	1.635	1.635				
11	3	1		2		2.82	1.980	.660		1.320		2.97
12	5	2		3		4.22	3.925	1.570		2.355		5.30
13	1	5	4		5.64		.922	4.610	3.688		8.30	
14	7			7		9.85	7.483			7.483		16.82
15	4	6	2		2.82		4.908	7.362	2.454		5.52	
16	2	3	1		1.41		2.792	4.188	1.396		3.14	
17	2	3	1		1.41		3.152	4.728	1.576		3.54	
18	1			1		1.41	1.767			1.767		3.97
19		3	3		4.23			5.907	5.907		13.30	
20	2			2		2.82	4.362			4.362		9.80
21		1	1		1.41			2.405	2.405		5.40	
22		1	1		1.41			2.640	2.640		5.94	
Totals	96	69	22	49	31.00	69.00	42.625	44.947	23.393	21.071	52.63	47.37
											52.63	
% of orig.		72	23	51				106	55	49		
Ave. DBH.							9.02	10.93				

Maple

Comp. 6.

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA.	Loss in BA.	Percent Gain & Loss
1	39	35	26		32.10	.054	.210	.156		.79
2	3	10	7		8.65	.066	.220	.154		.78
3	3	1		2	2.47	.147	.049		.098	.50
4	7	1		6	7.40	.609	.087		.522	2.66
5	11	7		4	4.94	1.496	.952		.544	2.78
6	19	7		12	14.82	3.724	1.372		2.352	11.97
7	13	8		5	6.17	3.471	2.136		1.335	6.80
8	16	13		3	3.70	5.587	4.537		1.047	5.32
9	16	9		7	8.65	7.072	3.978		3.094	15.75
10	14	11		3	3.70	7.630	5.995		1.635	8.32
11	10	10				6.600	6.600			
12	9	10	1		1.23	7.065	7.850	.785		3.98
13	6	6				5.532	5.532			
14	2	4	2		2.47	2.138	4.276	2.138		10.88
15	1	1				1.227	1.227			
16	1	1				1.396	1.396			
17		2	2		2.47		3.152	3.152		16.02
22		1	1	1	1.23		2.640	2.640		13.45
Totals	140	137	39	42	48.15	51.85	53.811	52.209	9.025	10.627	45.90	54.10
% of original		98	28	30			97	16.8	19.8	
Ave DBH.						8.37	8.35			

C III 9

Black Walnut

Comp. 6.

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Numb.	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	1			1	11.1	.006			.006	.15
2	3			3	33.4	.066			.066	1.60
6	1			1	1.1	.196			.196	4.75
9	1	1				.442	.442			
12	1			1	1.1	.785			.785	19.10
13	2	1		1	1.1	1.844	.922		.922	22.40
14		2	2		22.2		2.138	2.138		52.00
Totals	9	4	2	7	22.2 77.8	3.339	3.502	2.138	1.975	52.00 48.00
% of orig.		44.5	22.2	77.7			105	64	59	
Ave. DBH						8.24	12.67			

Elm.

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Numb.	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	22	61	39		55.71	.132	.366	.234		6.25
2	9	27	18		25.71	.198	.594	.396		10.50
3	2	7	5		7.14	.098	.343	.245		6.54
4		3	3		4.29		.261	.261		6.96
5	1			1	1.43	.136			.136	3.63
6	1			1	1.43	.196			.196	5.23
7	2	1		1	1.43	.534	.267		.267	7.13
12		1	1		1.43		.785	.785		20.98
15	1			1	1.43	1.227			1.227	32.78
Totals	38	100	66	4	94.28 5.72	2.521	2.616	1.921	1.826	51.23 48.77
% of orig.		263.5	174.0	10.5			103.8	76.3	72.5	
Ave. DBH.						3.47	2.2			

Black Cherry

Comp. 6.

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	1	4	3		23.06	.006	.024	.018		.41
2		3	3		23.07		.066	.066		1.51
6	1			1	7.70	.196			.196	4.48
7	3			3	23.07	.801			.801	18.36
9	1	1				.442	.442			
11		1	1		7.70		.660	.660		15.11
15	1			1	7.70	1.227			1.227	28.15
16		1	1		7.70		1.396	1.396		32.08
Totals	7	10	8	5	61.53 38.47	2.672	2.588	2.140	2.224	49.01 50.99
% of original		143	114.5	71.5			97	80.4	83.4	
Ave. DBH.						8.37	6.27			

Basswood

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss
1	3	20	17		65.4	.018	.120	.102		18.9
2	3	6	3		11.5	.066	.132	.066		12.3
3		4	4		15.4		.196	.196		36.4
4		2	2		7.7		.174	.174		32.4
Totals	6	32	26		100	.084	.622	.538		100.0
% of original		534	434				741	641		
Ave. DBH.						1.60	1.87			

C III h

Ironwood

Comp. 6.

DBH Class	No. of Trees 1922	1932	Gain in Numb.	Loss in Numb.	Percent Gain & Loss		Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss	
1	347	834	487		64.62		2.082	5.004	2.922		19.05	
2	200	399	199		26.43		4.400	8.778	4.378		28.55	
3	61	78	17		2.26		2.989	3.822	.833		5.40	
4	24	8		16		2.13	2.088	.696		1.392		9.06
5	21	1		20		2.66	2.856	.136		2.720		17.70
6	11	1		10		1.36	2.156	.196		1.960		12.75
7	5	2		3		.40	1.335	.534		.801		5.22
8	2	1		1		.14	.698	.349		.349		2.27
9	1	1					.422	.422				
Totals	672	1325	703	50	93.31	6.69	19.026	19.937	8.133	7.222	53.00	47.00
% of orig.		197	105	8				105	43	38		
Ave. DBH							2.27	1.65				

Blue Beech

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Numb.	Percent Gain & Loss		Basal Area 1922	1932	Gain in BA	Loss in BA	Percent Gain & Loss	
1	6	8	2		25		.036	.048	.012		7.02	
2	1	6	5		62.5		.022	.132	.110		64.30	
3	1			1		12.5	.049			.049		28.68
Totals	8	14	7	1	87.5	12.5	.107	.180	.122	.049	71.32	28.68
% of orig.		175	87.5	12.5				168	114	46		
Ave. DBH.							1.55	1.55				

Dogwood

Comp. 6

DBH Class	No. of Trees 1922	1932	Gain in Number	Loss in Number	Percent Gain and Loss		Basal Area 1922	1932	Gain in B.A	Loss in B.A	Percent Gain	Loss
1	2	55	53		49.10		.012	.330	.318		8.71	
2	11	6		5		4.63	.242	.132		.110		3.02
3	31			31		28.65	1.519			1.519		41.65
4	18			18		16.69	1.566			1.566		42.90
5	1			1		.93	0.136			.136		3.72
Totals	63	61	53	55	49.10	50.90	3.475	.462	.318	3.331	8.71	91.29
% of Original		97	84	87				13	9	96		
Ave. D.B.H.							3.17	1.16				

Crataegus

DBH Class	No. of Trees 1922	1932	Gain in Numb.	Loss in Number	Percent Gain and Loss		Basal Area 1922	1932	Gain in B.A	Loss in B.A	Percent Gain	Loss
1	2			2		16.7	.012					
2	5			5		41.7	.110					
3	3			3		25.0	.147					
4	2			2		16.6	.174					
Totals	12			12		100.00	.443					100

Sassafras

DBH Class	No. of Trees 1922	1932
1	0	1

Chart IV. Diameter Distribution of Merchantable Species.

Comp. 6

DBH Class	Stand in 1922	Stand in 1932		
1	60	206	Mean diameter in 1922	7.8 inches
2	33	75	Mean diameter " 1932	9.35 inches
3	28	25		
4	59	14	Standard deviation in 1922	4.74 inches
5	58	24	Standard deviation in 1932	4.96 inches
6	19	29		
7	75	56	Coefficient of Variation in 1922	61%
8	63	54	Coefficient of Variation in 1932	53%
9	10	44		
10	62	59		
11	44	51		
12	36	43		
13	35	37		
14	20	24		
15	14	28		
16	11	16		
17	5	15		
18	3	1		
19	2	5		
20	4			
21	1	3		
22	2	2		
23		1		
24		2		
25	1	1		
26	2			
27	1			
28	1	1		
29	1			
30				
31		1		
32				
33	1			
34				
35		1		
Totals	771	818		

COMPUTATIONS FOR COMPARTMENT X

Original Composition against Present Composition.

Comp. 10

Species	Percent of Number of Trees		Percent of Basal Area	
	1926	1936	1926	1936
R. Oaks	4.96	4.87	42.80	33.22
Wh. Oak	2.44	1.26	9.36	11.73
Wh. Ash	6.07	10.58	2.04	4.09
Hickory	4.39	3.32	9.41	4.52
Bl. Walnut	3.24	3.32	3.62	3.79
Basswood	31.90	24.15	15.09	13.16
Elm	8.55	8.44	6.84	13.31
Bl Cherry	13.84	15.85	1.59	3.18
H. Maple	.42	1.55	1.61	2.42
Butternut	.63	.04	2.52	.14
Scotch Pine	4.24	10.67	.23	7.52
Douglas Fir	.42	5.96	.02	1.85
Ironwood	3.28	3.82	.60	.35
Blue Beech	5.12	5.25	.54	.53
Miscellaneous	10.45	.50	3.56	.06
Wh. Pine		.42		.13
Y Poplar	.05		.17	.
Totals	100.00	100.00	100.00	100.00

Summary

Comp. 10.

Species	Stand in 1926	Stand in 1936	Increase in Number	Decrease in Number	Percent Increase	Percent Decrease	Basal Area 1926	Basal Area 1936	Increase in BA	Decrease in BA	Percent Increase	Percent Decrease
N.R. Oak	95	116	21		2.14		134.937	85.246		49.691		33.35
Wh. Oak	46	30		16		1.63	29.523	30.213	.690		.45	
Wh. Ash	116	252	136		13.87		6.427	10.482	4.055		2.72	
Hickory	84	79		5		.51	29.616	11.570		18.046		12.10
Bl. Walnut	62	79	17		1.73		11.358	9.704		1.654		1.10
Basswood	610	576		34		3.46	47.620	33.710		13.910		9.34
Elm	164	201	37		3.78		21.567	34.052	12.485		8.35	
Bl. Cherry	265	380	115		11.73		5.024	8.245	3.221		2.16	
H. Maple	8	37	29		2.96		5.053	6.206	1.153		.76	
Butternut	12	1		11		1.12	7.956	.267		7.689		5.16
Scotch Pine	81	253	172		17.50		.726	19.275	18.549		12.44	
Douglas Fir	8	142	134		13.68		.048	4.724	4.676		3.14	
Ironwood	63	91	28		2.86		1.903	.893		1.010		.68
Blue Beech	98	125	27		2.76		1.718	1.343		.375		.25
Miscellaneous	200	12		188		19.15	11.199	.147		11.052		7.42
Wh. Pine		10	10		1.02			.328	.328		.22	
Y. Poplar	1			1		.10	.545			.545		.36
Totals	1913	2384	726	255	74.03	25.97	315.220	256.405	45.157	103.972	30.24	69.76

Increase in No. of Trees	471	Decrease in Basal Area	58.815
% Increase	24.6	% Decrease	18.7
Ave. per Acre	445	554	169 59	73.307	59.629
Increase per Acre	110	Decrease per Acre	13.678
Average DBH			5.5	4.44
Spacing Figure.			21.61	23.96

Red Oak — Comp. 10.

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1926	Basal Area 1936	Gain in BA	Loss in BA	Percent Gain	Percent Loss
1	7	33	26		26.80		.042	.196	.154		.14	
2	3	21	18		18.60		.066	.462	.396		.33	
3	3	4	1		1.03		.147	.196	.049		.03	
4	1	2	1		1.03		.087	.174	.087		.08	
5	3	2		1		1.03	.408	.272		.136		.12
6	2	2					.392	.392				
7	2	3	1		1.03		.534	.801	.267		.25	
8	2			2		2.06	.698			.698		.64
9	4	2		2		2.06	1.768	.884		.884		.82
10	3	1		2		2.06	1.635	.545		1.090		1.01
11	6	1		5		5.16	3.960	.660		3.300		3.06
12	6	5		1		1.03	4.710	3.925		.785		.72
13	6	2		4		4.12	5.532	1.844		3.708		3.44
14	6	2		4		4.12	6.414	2.138		4.276		3.96
15	2	7	5		5.16		2.454	8.589	6.135		5.68	
16	4	3		1		1.03	5.584	4.188		1.396		1.29
17	6	2		4		4.12	9.456	3.152		6.304		5.82
18	3	2		1		1.03	5.201	3.534		1.667		1.54
19	5	6	1		1.03		9.845	11.814	1.969		1.82	
20	4	3		1		1.03	8.724	6.543		2.181		2.10
21	3	4	1		1.03		7.215	9.620	2.405		2.23	
22	4	2		2		2.06	9.560	4.780		4.780		4.43
23	1	1					2.885	2.885				
24		1	1		1.03			3.142	3.142		2.92	
25		3	3		3.08			10.230	10.230		9.48	
26	2	1		1		1.03	7.380			7.380		6.84
27	3			3		3.09	11.940			11.940		11.08
28		1	1		1.03			4.280	4.280		3.96	
29												
30	1			1		1.03	4.910			4.910		4.54
35	1			1		1.03	6.680			6.680		6.19
36	1			1		1.03	7.070			7.070		6.56
42	1			1		1.03	9.620			9.620		8.90
Totals	95	116	59	38	60.85	39.15	134.937	85.246	29.114	78.805	26.92	73.08
% of Orig.		122	62	40				63.20	21.6	58.4		
Ave DBH.								14.45	11.6			

Wh. Oak — Comp. 10.

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1926	Basal Area 1936	Gain in BA	Loss in BA	Percent Gain	Percent Loss
1	6	1		5		15.66	.036	.006		.030		.07
2	5	4		1		3.12	.110	.088		.022		.02
3	4	2		2		6.25	.196	.098		.098		.24
4	2	3	1		3.12		.174	.261	.087		.21	
5	3	3					.408	.408				
6	4	1		3		9.40	.784	.196		.588		1.45
7	2	2					.534	.534				
8	1	1					.349	.349				
9	1	1					.442	.442				
10	2			2		6.25	1.090			1.090		2.69
11	3	2		1		3.12	1.980	1.320		.660		1.63
12	2			2		6.25	1.570			1.570		3.88
13	1	1					.922	.922				
14	2	1		1		3.12	2.138	1.069		1.069		2.64
15	2			2		6.25	2.454			2.454		6.03
16		2	2		6.25			2.792	2.792		6.87	
17	1			1		3.12	1.576			1.576		3.89
18	1			1		3.12	1.767			1.767		4.35
19		2	2		6.25			3.938	3.938		9.70	
20	1			1		3.12	2.181			2.181		5.38
24	1			1		3.12	3.142			3.142		7.75
26	1			1		3.12	3.690			3.690		9.10
27	1	2	1		3.12		3.980	7.960	3.980		9.82	
29		1	1		3.12			4.590	4.590		11.33	
31		1	1		3.12			5.240	5.240		12.95	
Totals	46	30	8	24	24.98	75.02	29.523	30.213	20.627	19.937	50.86	49.12
% of orig.		65.2	17.4	34.8				103	70	67		
Ave. DBH.							10.85	13.60				

Wh. Ash

Comp. 10.

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	Basal Area 1936	Gain in BA	Loss in BA	Percent Gain & Loss
1	66	111	45		31.24	.396	.666	.270		2.02
2	36	82	46		31.95	.797	1.804	1.007		7.55
3	7	30	23		16.00	.343	1.470	1.127		8.46
4	3	17	14		9.72	.261	1.479	1.218		9.13
5		5	5		3.48		.680	.680		5.10
6		4	4		2.78		.784	.784		5.89
7										
8		1	1		.69		.349	.349		2.62
10	1			1	.69	.545			.545	4.10
13	1			1	.69	.922			.922	6.93
14		1	1		.69		1.069	1.069		8.03
16	1			1	.69	1.396			1.396	10.49
18	1			1	.69	1.767			1.767	13.28
20		1	1		.69		2.181	2.181		16.40
Totals	116	252	140	4	2.76	97.24	6.427	10.482	8.685	4.630	65.20	34.80
					Loss	Gain						
% of orig.		217.5	120.9	3.4				163	135	72		
Ave. DBH.							3.2	2.73				

Hickory.

Comp # 10

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	Basal Area 1936	Gain in BA	Loss in BA	Percent Gain & Loss
1	36	37	1		2.44	.216	.222	.006		.03
2	3	15	12		29.22	.066	.330	.264		1.11
3	3	6	3		7.32	.147	.294	.147		.62
4	4	2		2	4.88	.348	.174		.174	.73
5	4	2		2	4.88	.544	.272		.272	1.15
6	3	3				.488	.488			
7	5			5	12.20	1.335			1.335	5.64
8	3	3				1.047	1.047			
9	3	1		2	4.88	1.326	.442		.884	3.74
10	8	4		4	9.78	4.360	2.180		2.180	9.20
11	1	2	1		2.44	.660	1.320	.660		2.78
12	2	1		1	2.44	1.570	.785		.785	3.32
13	4	1		3	7.32	3.688	.922		2.766	11.68
14	1			1	2.44	1.069			1.069	4.51
15	1	1				1.227	1.227			
16										
17	1			1	2.44	1.576			1.576	6.64
18		1	1		2.44		1.767	1.767		7.45
19	1			1	2.44	1.969			1.969	8.30
38	1			1	2.44	7.880			7.880	33.10
Totals	84	79	18	23	43.86	56.14	29.616	11.570	2.844	20.890	11.99	88.01
% of Orig.		94	21.4	27.4			39.0	9.5	70.5			
Ave DBH.						8.04	5.18					

Elm

Comp. # 10

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Num6.	Loss in Num6.	Percent Gain + Loss	Basal Area 1926	Basal Area 1936	Gain in B.A.	Loss in B.A.	Percent Gain + Loss
1	64	47		17	21.50	.384	.262		.122	.33
2	35	53	18		22.80	.770	1.166	.396		1.06
3	25	30	5		6.33	1.225	1.470	.245		.66
4	14	21	7		8.85	1.218	1.827	.609		1.62
5	5	9	4		5.05	.680	1.224	.544		1.45
6	7	10	3		3.80	1.372	1.960	.588		1.56
7	5	7	2		2.52	1.335	1.869	.534		1.43
8	3	8	5		6.33	1.047	2.792	1.745		4.66
9		5	5		6.33		2.210	2.210 ✓		5.92
10	1	2	1		1.27	.545	1.090	.545		1.45
11	1	2	1		1.27	.660	1.320	.660		1.77
12		1	1		1.27		.785	.785		2.10
13		1	1		1.27		.922	.922		2.47
14		1	1		1.27		1.069	1.069		2.86
15										
16		1	1		1.27		1.396	1.396		3.74
20	2			2	2.52	2.181			2.181	5.78
25		1	1		1.27		3.410	3.410		9.12
26		1	1		1.27		3.690	3.690		9.88
30	1			1	1.27	4.910			4.910	13.12
31	1			1	1.27	5.240			5.240	14.02
32		1	1		1.27		5.590	5.590		15.00
Totals	164	201	58	21	73.44	26.562	21.567	34.052	24.938	12.453	66.75	33.25
% of Orig.		122.6	35.4	12.8				158	115.8	57.8		
Ave. D.B.H.						4.92	5.58			

Basswood.

Comp. 10

DBH Class	No. of Trees 1926	1936	Gain in Number	Loss in Numb.	Percent Gain	Loss	Basal Area 1926	1936	Gain in BA.	Loss in BA.	Percent Gain	Loss
1	350	218		132		52.7	2.100	1.308		.792		1.72
2	158	184	26		10.4		3.476	4.048	.572		1.24	
3	51	79	28		11.2		2.499	3.871	1.372		2.96	
4	24	45	21		8.4		2.088	3.915	1.827		3.96	
5	10	21	11 ✓		4.4		1.360	2.856	1.496		3.22	
6	3	9	6		2.5		.488	1.764	1.276		2.75	
7	1	8	7		2.8		.267	2.136	1.869		4.05	
8	1	5	4		1.6		.349	1.745	1.396		3.03	
9		1	1		.4			.442	.442		.96	
10		2	2		.8			1.090	1.090		2.35	
11												
12		1	1		.4			.785	.785		1.70	
15	1			1		.4	1.227			1.227		2.65
20	4			4		1.6	8.724			8.724		18.95
22	2			2		.8	5.280			5.280		11.45
23	2	2					5.770	5.770				
24	1			1		.4	3.142			3.142		6.82
27		1	1		.4			3.980	3.980		8.64	
30	1			1		.4	4.910			4.910		10.65
33	1			1		.4	5.940			5.940		12.90
Totals	610	576	108	142	43.3	56.7	47.620	33.710	16.105	30.015	34.86	65.14
% of Orig.		94.5	17.7	23.2				71.0	34.0	63.0		
Ave DBH.							3.8	3.3				

Hard Maple

Comp. 10.

DBH Class	No. of Trees 1926	1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	1936	Gain in B.A.	Loss in BA	Percent Gain & Loss
1	4	16	12		32.50	.024	.096	.072		.65
2		15	15		40.50		.330	.330		2.95
3		2	2		5.40		.098	.098		.88
4										
5										
11	2			2	5.40	1.320			1.320	11.70
12		2	2		5.40		1.570	1.570		14.02
13										
14	1			1	2.70	1.069			1.069	9.55
15		1	1		2.70		1.227	1.227		10.95
22	1			1	2.70	2.640			2.640	23.55
23		1	1		2.70		2.885	2.885		25.75
Totals	8	37	33	4	89.20	10.80	5.053	6.206	6.182	5.029	55.20	44.80
% of orig.		462.5	412.5	50			123	122	1			
Ave. D.B.H.						10.77	5.55					

Black Cherry

Comp. 10

DBH Class	No. of Trees 1926	1936	Gain in Numb.	Loss in Numb.	Percent Gain & Loss		Basal Area 1926	1936	Gain B"A	Loss B"A	Percent Gain & Loss	
1	155	219	64		53.84		.930	1.314	.384		10.78	
2	77	101	24		20.10		1.694	2.222	.528		14.80	
3	20	42	22		18.50		.980	2.058	1.078		30.20	
4	11	9		2		1.68	.957	.783		.174		4.87
5		3	3		2.52			.408	.408		11.44	
6	1	2	1		.84		.196	.392	.196		5.50	
7	1	4	3		2.52		.267	1.068	.801		22.41	
Totals	265	380	117	2	98.32	1.68	5.024	8.245	3.395	.174	95.13	4.87
% of Original		143.6	44.2	.8				164.0	67.5	3.5		
DBH-Average							1.85	2.0				

Butternut

DBH Class	No. of Trees 1926	1936	Gain in Number	Loss in Number	Percent Gain & Loss		Basal Area 1926	1936	Gain B"A	Loss B"A	Percent Gain & Loss	
1												
2	7			7		53.9	.154					1.88
4	1			1		7.7	.087					1.06
7		1	1		7.7			.267			3.41	
13	2			2		15.3	1.844					22.40
20	1			1		7.7	2.181					26.40
26	1			1		7.7	3.690					44.85
Totals	12	1	1	12	7.7	92.3	7.956	.267			3.41	96.59
% of Original		8.3	8.3	100								
Ave. DBH.							11.2	7.0				

Bl. Walnut — Comp. 10

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	Basal Area 1936	Gain in B.A	Loss in B.A	Percent Gain & Loss
1	25	23		2	5.13	.150	.138		.012	.08
2	19	16		3	7.70	.418	.352		.066	.36
3	7	14	7		17.95	.343	.686	.343		1.90
4	3	9	6		15.39	.261	.603	.342		1.89
5	1	7	6		15.39	.136	.952	.816		4.48
6	1	5	4		10.26	.196	.980	.784		4.31
7		1	1		2.56		.267	.267		1.47
8		1	1		2.56		.349	.349		1.92
14	1			1	2.56	1.069			1.069	5.88
15	2			2	5.13	2.454			2.454	13.50
16		1	1		2.56		1.396	1.396		7.66
17		1	1		2.56		1.576	1.576		8.65
18										
19	1			1	2.56	1.969	~~1.382~~		1.969	10.80
20	2			2	5.13	4.362			4362	23.90
21		1	1		2.56		2.405	2.405		13.20
Totals	62	79	28	11	71.79 28.21	11.358	9.704	8.278	9.932	45.48 54.52
% of orig.		127.5	45.25	17.75			85.5	73.0	87.5	
Ave. D.B.H.						5.8	4.76			

Iron wood

Comp. 10

DBH Class	No. of Trees 1926	1936	Gain in Numb.	Loss in Number	Percent Gain+Loss	Basal Area 1926	1936	Gain in Bas. A.	Loss in BA	Percent Gain+Loss
1	26	71	45		72.6	.156	.426	.270		17.43
2	22	19		3	4.84	.484	.418		.066	4.26
3	10	1		9	14.50	.490	.049		.441	28.42
4	2			2	3.23	.174			.174	11.24
5	1			1	1.61	.136			.136	8.77
6	1			1	1.61	.196			.196	12.66
7	1			1	1.61	.267			.267	17.22
Totals	63	91	45	17	72.6 27.4	1.903	.893	.270	1.280	17.43 62.57
% of orig.		144.5	71.5	27.0			47.0	14.0	67.0	
Ave. DBH.						2.43	1.35			

Blue Beech.

DBH Class	No. of Trees 1926	1936	Gain in Numb.	Loss in Numb.	Percent Gain+Loss	Basal Area 1926	1936	Gain in BA	Loss in BA	Percent Gain+Loss
1	74	93	19		57.55	.444	.558	.114		9.53
2	20	29	9		27.30	.440	.638	.198		16.53
3	1	3	2		6.06	.049	.147	.098		8.21
4	1			1	3.03	.087			.087	7.28
8	2			2	6.06	.698			.698	58.45
Totals	98	125	30	3	90.91 9.09	1.718	1.343	.410	.785	34.27 65.73
% of orig.		127.8	30.8	3			78	23.8	45.8	
Ave. DBH.						1.8	1.4			

Miscellaneous Weed Species. Comp. 0.
Sassafras, Dogwood, Blue Ash, Crataegus

DBH Class	No. of Trees 1926	No. of Trees 1936	Gain in Number	Loss in Number	Percent Gain	Percent Loss	Basal Area 1926	Basal Area 1936	Gain in BA	Loss in BA	Percent Gain	Percent Loss
1	65	9		56		29.8	.390	.054		.336		3.04
2	52	2		50		26.6	1.144	.044		1.100		9.96
3	~~34~~	1		33		17.52	1.666	.049		1.617		14.62
4	22	0		22		11.7	1.914			1.914		17.30
5	7	0		7		3.73	.952			.952		8.63
6	9	0		9		4.79	1.764			1.764		15.96
7	8	0		8		4.26	2.136			2.136		19.33
8	1	0		1		.53	.349			.349		3.16
9	2	0		2		1.07	.884			.884		8.00
Totals	200	12		188		100.0	11.199	.147		11.052		100.0
% of orig.		6	0	94				1.3	0	98.7		
Ave DBH.							3.2	1.5				

Tulip Poplar

DBH Class	No. of Trees 1926	No. of Trees 1936	Percent	Basal Area
10	1		Gain/loss	.545
			100	

Wh. Pine

DBH Class	No. of Trees 1926	No. of Trees 1936	Percent Gain	Basal Area 1920	Basal Area 1936
1					
2		6	60		.132
3		4	40		.196
		10	100		.328

Scotch Pine

comp. 10.

DBH Class	No. of Trees 1926	1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	1936	Gain in B.A.	Loss in B.A.	Percent Gain & Loss
1	66	26		40	15.85	.396	.156		.240	1.26
2	15	48	33		13.10	.330	1.056	.726		3.82
3		48	48		19.05		2.352	2.352		12.35
4		65	65		25.80		5.655	5.655		29.74
5		48	48		19.05		6.528	6.528		34.30
6		18	18		7.15		3.528	3.528		18.53
Totals	81	253	212	40	84.15 15.85	.726	19.275	18.789	.240	98.74 1.26
% of origin		311	41	270			2660	2590	70	
Average DBH						1.1	3.7			

Douglas Fir.

DBH Class	No. of Trees 1926	1936	Gain in Number	Loss in Number	Percent Gain & Loss	Basal Area 1926	1936	Gain in B.A.	Loss in B.A.	Percent Gain & Loss
1	8	19	11		8.21	.048	.114	.066		1.45
2		72	72		53.71		1.584	1.584		33.85
3		41	41		30.61		2.009	2.009		42.90
4		7	7		5.23		.609	.609		13.05
5		3	3		2.24		.408	.408		8.75
Totals	8	142	134		100.00	.048	4.724	4.676		100.00
% of origin.		1780	1680				9850	9750		
Average DBH.						1.0	2.46			

Diameter Distribution of the More Desirable Species.

DBH Class	No. of Trees Stand 1926	Stand 1936
1	787	750
2	358	617
3	120	302
4	63	180
5	26	103
6	21	54
7	16	26
8	10	16
9	8	10
10	16	9
11	13	7
12	10	10
13	14	5
14	11	5
15	8	9
16	5	7
17	8	3
18	5	3
19	7	8
20	14	4
21	3	5
22	7	2
23	3	4
24	2	1
25	0	4
26	4	2
27	4	3
28		1
29		1
30	3	
31	1	1
32		1
33	1	
35	1	
36	1	
38	1	
42	1	
Totals	1552	2163

Arithemetic Average in 1926	3.34
Arithmetic Average in 1936	3.01
Standard Deviation in 1926	5.03
Standard Deviation in 1936	3.7
Coefficient of Variation in 1926	150%
Coefficient of Variation in 1936	123%
Percent Increase in number of Trees.	39%.

Forestry M.T.	Brender, Ernst Results of improvement cuttings at Eber White woods. 1940

Warren H. Wagner 3010 N.S.	MAY 18 '58	Faculty