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REPRODUCTION SURVEY

OF

EBER WHITE WOODS

by

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Reproduction Survey of Eber White Woods

Object of Survey:

To determine the percentage by species and the total number by species of all reproduction (3 feet or under in height) by means of the quadrat system, for the entire 10 lots of Eber White Woods, a University of Michigan property, located in Ann Arbor, Michigan.

Equipment Used

Compass and jake staff,
One 100 link measuring tape,
Set of surveyors pins,
Four bamboo (fish) poles each 6.6 feet long,
One piece of string- several feet long,
One book - "Michigan Trees" - by C. H. Otis,
Tally sheets and pencil.



Procedure

Much the same procedure was employed as that explained by I. T. Haig, in Ecology 1929. Mill-acre quadrats (squares 6.6 feet on a side) were laid out with the bamboo poles at intervals of 33 feet or one-half chain apart along parallel strips. The latter were determined by use of the compass. Adjacent strips were

spaced 100, 115, or 125 feet apart, depending upon the shape of each individual lot.

An attempt was made to distribute the strips very thoroughly over the area in this sampling.-(See map)

An 86 per cent coverage was made of the entire woods, in the above manner.

The reproduction within the boundaries of the bamboo poles laid down in the following manner  along the parallel strips was identified as to species, counted and tallied for each quadrat, on each lot. Whenever the reproduction appeared very heavy the piece of string was strung crosswise of the square, i.e.  to facilitate counting.

The computation for the per cent of coverage will be found at the end of this paper, while the results of the survey by lots are as follows;

Lot -I

Number of quadrats - 3I

Species Present	Number of Seedlings in 3I quad's	Species Per Cent	Total Reproduction By Species On Lot I
1 White Ash, (<i>Fraxinus Americana</i>)	56	26.2	7,774
2 Basswood, (<i>Tilia Americana</i>)	45	21.0	6,230
3 Sugar Maple (<i>Acer Saccharum</i>)	43	20.1	5,964
4 Ironwood, (<i>Ostrya Virginiana</i>)	23	10.7	3,175
5 Black Cherry (<i>Prunus Serotina</i>)	22	10.3	3,056
6 American Elm (<i>Ulmus Americana</i>)	10	4.7	1,396
7 Shagbark Hickory, (<i>Hicoria Ovata</i>)	8	3.7	1,097
8 Swamp White Oak, (<i>Quercus Bicolor</i>)	5	2.3	682
9 Red Maple, (<i>Acer Rubrum</i>)	1	.5	148
10 Red Oak, (<i>Quercus Borealis</i>)	1	.5	148
Totals	214	100.0	29,670

214 seedlings on 3I quadrats = 6.90 seedlings per quad
3I quadrats

1000X 6.90 = 6,900 seedlings per Acre on lot I

4.3 Acres X 6,900 seedlings = 29,670 Total number of seedlings on lot I

The 29,670 seedlings on the lot are distributed in the proportion or number as shown in the last column of the above chart.

Note:- In the following sheets the scientific name of the species will be omitted to avoid repetition but inserted where new species are listed.

Lot - 2

Number of quadrats - 38

Species	Number of Seedlings in 38 quads	Species Per Cent	Total Reproduction By Species On Lot 2
1 Basswood	68	26.1	7677
2 White Ash	66	25.4	7471
3 Sugar Maple	45	17.3	5083
4 Ironwood	42	16.1	4735
5 Black Cherry	22	8.5	2500
6 American Elm	9	3.5	1009
7 White Oak	6	2.3	677
8 Shagbark Hickory	2	.8	235
Totals	260	100.0	29,412

$$\frac{260 \text{ seedlings}}{38 \text{ quadrats}} = 6.84 \text{ seedlings per quadrat.}$$

$$1000 \times 6.84 = 6,840 \text{ seedlings per acre on lot 2}$$

$$4.3 \text{ Acres} \times 6,840 = 29,412 \text{ seedlings on lot 2}$$

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Lot - 3

Number of quadrats - 23

Species	Number of Seedlings in 23 Quads	Species Per Cent	Total Reproduction By Species on Lot 3
1 White Ash	68	25.0	9470
2 Sugar Maple	66	24.3	9206
3 Basswood	45	16.5	6251
4 Black Cherry	34	12.4	4697
5 Ironwood	31	11.3	4280
6 American Elm	10	3.6	1364
7 Shagbark Hickory	8	2.9	1099
8 White Oak	8	2.9	1099
9 Red Oak	2	.8	303
10 Red Maple	1	.3	114
Totals	273	100.0	37,883

$\frac{273 \text{ seedlings}}{23 \text{ quads}} = 8.81 \text{ seedlings per quadrat.}$

$1000 \times 8.81 = 8,810 \text{ seedlings per acre on lot 3}$

$4.3 \text{ Acres} \times 8,810 = 37,883$

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Lot - 4

Number of quadrats - 46

Species	Number of Seedlings in 46 quadrats	Species Per Cent	Total Reproduction By Species on Lot 4
1 Sugar Maple	178	34.4	16,626
2 White Ash	135	26.1	12,615
3 Basswood	72	14.0	6,766
4 Black Cherry	70	13.6	6,573
5 Ironwood	43	8.3	4,011
6 White Oak	6	1.1	532
7 American Elm	6	1.1	532
8 Shagbark Hickory	4	.8	387
9 Red Maple	2	.4	193
10 Red Oak	1	.2	96
Totals	517	100.0	48,332

$\frac{517 \text{ seedlings}}{46 \text{ quadrats}} = 11.24 \text{ seedlings per quadrat.}$

$1000 \times 11.24 = 11,240 \text{ seedlings per acre on lot 4}$

$4.3 \text{ acres} \times 11,240 = 48,332 \text{ seedlings on lot 4}$

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Lot - 5

Number of quadrats 34

Species	Number of Seedlings in 34 quads	Species Per Cent	Total Reproduction By Species on Lot 5
I White Ash	109	33.1	13,763
2 Sugar Maple	86	26.2	10,895
3 Ironwood	47	14.3	5,946
4 Basswood	26	7.9	3,286
5 White Oak	21	6.3	2,620
6 Black Cherry	18	5.4	2,245
7 Shagbark Hickory	9	2.8	1,164
8 American Elm	7	2.1	873
9 Red Oak	3	.9	374
10 Black Ash (Fraxinus Migra)	2	.7	291
II Red Maple	1	.3	124
Totals	329	100.0	41,581

329 seedlings = 9.67 seedlings per quadrat.
34 quadrats

1000 X 9.67 = 9,670 seedlings per acre on lot 5

4.3 acres X 9,670 = 41,581 seedlings on lot 5

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Lot -6

Number of quadrats - 38

Species	Number of Seedlings in 38 Quads	Species Per Cent	Total Reproduction By Species on Lot 6
I Sugar Maple	126	30.9	14,215
2 Ironwood	81	20.0	9,202
3 White Ash	77	19.0	3,743
4 Black Cherry	75	18.4	3,467
5 Basswood	25	6.1	2,807
6 Shagbark Hickory	10	2.4	1,104
7 Bitternut Hickory	4	1.0	460
8 (Hicoria cordiformis)			
8 Whit Oak	4	1.0	460
9 American Elm	2	.5	230
10 Red Maple	2	.5	230
II Norway Maple			
(Acer glaberrimum)	1	.2	92
Totals	407	100.0	46,010

407 seedlings = 10.70 seedlings per quadrat.
38 quadrats

1000 X 10.70 = 10,700 seedlings per acre on lot 6

4.3 acres X 10,700 = 46,010 seedlings on lot 6

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Lot -7

Number of quadrats -34

Species	Number of Seedlings in 34 Quads	Species Per Cent	Total Reproduction By Species on Lot 7
I Sugar Maple	107	40.7	13,545
2 Basswood	40	15.2	5,059
3 Ironwood	30	11.4	3,794
4 Black Cherry	25	11.0	3,661
5 White Ash	25	9.5	3,162
6 American Elm	11	4.1	1,365
7 Red Maple	7	2.7	899
8 White Oak	7	2.7	899
9 Shagbark Hickory	4	1.5	499
10 Red Oak	2	.8	265
11 Norway Maple	1	.4	133
Totals	263	100.0	33,282

$\frac{263 \text{ seedlings}}{34 \text{ quadrats}} = 7.74 \text{ seedlings per quadrat.}$

$1000 \times 7.74 = 7,740 \text{ seedlings per acre on lot 7}$

$4.3 \text{ acres} \times 7,740 = 33,282 \text{ seedlings on lot 7}$

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Lot - 8

Number of quadrats - 40

Species	Number of Seedlings in 40 Quads	Species Per Cent	Total Reproduction By Species On Lot 8
1 Basswood	108	25.8	11,597
2 Black Cherry	92	22.0	9,894
3 Sugar Maple	83	20.0	8,990
4 White Ash	49	11.7	5,260
5 Ironwood	48	11.4	5,124
6 White Oak	16	3.8	1,707
7 Shagbark Hickory	13	3.1	1,393
8 Red Maple	7	1.7	764
9 Red Oak	2	.5	224
Totals	418	100.0	44,953

418 seedlings = 10.45 seedlings per quadrat.
40 quadrats

1000 X 10.45 = 10,450 seedlings per acre on lot 8

4.3 acres X 10,450 = 44,953 seedlings on lot 8

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Lot -9

Species	Number of Seedlings in 38 Quads	Species Per Cent	Total Reproduction By Species on Lot 9
1 Basswood	154	61.1	17,419
2 Black Cherry	41	16.2	4,619
3 Shagbark Hickory	21	8.4	2,394
4 White Oak	12	4.8	1,368
5 Sugar Maple	9	3.5	999
6 Ironwood	6	2.4	684
7 American Elm	5	2.0	570
8 White Ash	3	1.2	342
9 Red Maple	1	.4	114
Totals	252	100.0	28,509

$\frac{252 \text{ seedlings}}{38 \text{ quadrats}} = 6.63 \text{ seedlings per quadrat.}$

$1000 \times 6.63 = 6,630 \text{ seedlings per acre on lot 9}$

$4.3 \text{ acres} \times 6,630 = 28,509 \text{ seedlings on lot 9}$

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Lot 10

Number of quadrats - 40

Species	Number of Seedlings in 40 Quads	Species Per Cent	Total Reproduction By Species on Lot 10
1 Basswood	178	49.3	19,121
2 Black Cherry	56	15.5	6,012
3 White Ash	46	12.6	4,887
4 Sugar Maple	41	11.4	4,422
5 Ironwood	25	7.0	2,715
6 Shagbark Hickory	9	2.5	970
7 White Oak	4	1.1	427
8 Red Oak	1	.3	116
9 Red Maple	1	.3	116
Totals	361	100.0	38,786

$\frac{361 \text{ seedlings}}{40 \text{ quadrats}} = 9.02 \text{ seedlings per quadrat.}$

$1000 \times 9.02 = 9,020 \text{ seedlings per acre on lot 10}$

$4.3 \text{ acres} \times 9,020 = 38,786 \text{ seedlings on lot 10}$

Per Cent of Coverage of Entire Woods

This figure may be arrived at in the following manner:

1 Acre = 43,560 square feet.

Each lot contains 4.3 acres.

Total area of entire woods (10 lots) = 43 acres.

Total area of entire woods = 1,873,080 square feet.

Area per quadrat = 6.6 X 6.6 ft = 43.56 square feet.

Number of quadrats = 370. Each $\frac{1}{1000}$ th. of an acre.

Area taken up by quadrats = 370 X 43.56 = 16,117 square feet.

16,117 sq. ft. quadrat area = .0086 or .36% Coverage.
1,873,080 sq. ft. in entire woods

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