A SAMPLE OF THE VEGETATION IN THE

LAKE GEORGE DRAINAGE BASIN.

Part II: Composition of the canopy vegetation and some aspects of physigraphic and horizontal variation within the basin.

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A SAMPLE OF THE VEGETATION IN THE LAKE GEORGE DRAINAGE BASIN

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A final technical report for Union Carbide Subcontract No. 3566 for the Eastern Deciduous Forest Biome, IBP, Lake George Site

by

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PREFACE

This report summarizes the findings of the first two years of a planned five year study of the terrestrial portion of the Lake George Drainage Basin. The results presented here were to be part of a larger analysis of the basin ecosystem including studies of: (1) vegetation composition, productivity structure and ordination, (2) soils and land-use, (3) phenology, (4) consumer populations including small mammals, and (5) physical attributes including stream nutrient budgets, climatology and hydrology.

After about three years of planning the first funding from IBP allowed only parts of studies (1), (2) and (5). This report summarizes the results of studies funded only under (1), that is, the studies of natural vegetation in the basin based upon a random sample of sites.

Our plan for the first and second years was to sample the vegetation using a random sample to find out as much as possible about the present vegetation. At the same time we were to look for small watersheds where intensive analysis of the ecosystem plus watershed nutrient budgets would give us an idea of how certain treatments (various kinds of disturbance, etc.) affected local inputs to the lake. With our analysis of the entire basin we therefore thought that we could predict by simulation techniques, based upon our own data as well as data from other studies (i.e. Hubbard Brook), what would happen to the lake under a variety of treatments. Funding for the soils analysis and land-use never materialized. The vegetation and soils teams were to have worked jointly in the field but we decided to go ahead with the vegetation study in hopes that the soils team would later visit some of the stands we sampled when funding materialized. Funds for the second year (1971-72) were not available for either soils or continued work on the selected watersheds. It was decided by NSF and IBP that studies of the terrestrial portion of the basin would be discontinued.

Our original proposal called for a report of the first year of data collection and analysis (October 1971). Field work was completed in August 1971 and a complete set of data was submitted to IBP including a brief statement of what had been done. Since funding for our project ended in August 1971 we had no simple method of analyzing the large amount of data that had been taken. Some help was available from our own universities during the 1971-72 academic year on a part-time basis and so the data summary proceeded slowly. We thought that it would be better to delay our report rather than submit a very incomplete summary.

The report contains four parts. The first deals with sampling methods, physiographic, historical and land-use data for the 100 stands sampled. The second gives some simple aspects of vegetation composition including a discussion of how the important species are distributed in the basin. Some of this information was requested from other participants in the Lake George Study. The third report summarizes estimates of biomass and production for the basin canopy species using unpublished regression equations developed by R. H. Whittaker from Hubbard Brook N. H. data. Our estimates are compared with others for similar communities. Errors inherent in the method are given a preliminary discussion. The fourth and last report deals with ordination and cluster analysis of the random part of the sample for the southern basin. A wide range of communities results showing the difficulty of classification into general vegetation types. This verifies our original assumption that a simple vegetation-type breakdown was an unfruitful approach to division of the drainage basin vegetation. The clusters which result are not the same as those given in the literature primarily because disturbance is a major influence on the vegetation of the drainage basin.

The present report is considered incomplete. We have planned several higher levels of analysis for the data. These will be submitted as time permits since it seems unlikely that the Lake George IBP study will renew its interest in the terrestrial ecosystem.

The present memo report (No. 73-8) includes only Part II of the four report series. This is entitled: "Composition of the Canopy Vegetation and Some Aspects of Physiographic and Horizontal Variation within the Basin". Part I (Memo Report No. 71-125) was entitled "Description of the Sample, Methods, Physiographic, Historical and Land-use Information". Parts III and IV will follow as additional memo reports.

ABSTRACT

Hemlock (72% of stands), sugar maple (69%), white pine (64%), red maple and northern red oak (57%) were the most frequently encountered of 35 tree species occurring in 75 randomly selected stands in the Lake George drainage basin. Hemlock lead in density in 32% stands, followed by white pine (13%), beech (12%), northern red oak (9%) and red/sugar maple (8%). These species lead in a basal area in similar proportions of stands. A test of sampling adequacy for tree species in 55 south basin forest stands showed that importance values (relative density + relative basal area /2) of species that accounted for 75% of total importance were estimated to within 5%. Distribution patterns of hemlock and white pine were well defined as hemlock was most abundant in sloping stands at the lowest elevation (100 m) and generally prevailed on the east side of the basin, while white pine was best represented in level stands around 200 m, but uncommon in the east. Forest composition of our random sample for the drainage basin differed somewhat from 1970 estimates by Northeastern Forest Experiment Station in that pine-hemlock stands were more common (42%-18%) and elm-ash-red maple and spruce-fir less common (3%-17% and 0%-7%) in our sample.

A. INTRODUCTION

Quantitative data on vegetation in the Lake George Drainage Basin are practically non-existent. The only published data appears to be results of broad scale aerial photographic studies such as Ferree and Davis (1954) and the New York State Forestry Inventory by Ferguson and Mayer (1970). The several earlier reports sponsored by the New York State Museum are only floristic surveys.

Perhaps the richest source of qualitative vegetation information is the extensive popular literature on the region. Although references to vegetation are often in subjective terms, certain definitive attributes can often be recognized. For example, early maps and descriptions of Buck Mountain (formerly called "Deer Pasture Mountain") strongly suggest a patchy forest or savanna type condition before the earliest logging inroads. The existence of this vegetation condition (still present today) implies that it is the product of "natural" causes (perhaps repeated lightning fires) and not necessarily the result of clear cutting, overgrazing, or other disturbance.

While popular writings (and impressions) of the vegetation of the region contain much useful information they frequently tend to exaggerate certain aspects. Phrases such as "the terrific gloom of the deep dark forests" in older literature and contemporary references to the great diversity characteristic of the Adirondack wilderness stem from superficial examination and are misleading.

While the early forests may have been "deep, dark, and gloomy," the Adirondack wilderness is by no means floristically diverse as compared with other areas in the Eastern Deciduous Forest. Vegetation of the Lake George drainage basin has closer affinities to vegetation of the Hudson Valley than to Adirondack vegetation. This is partly because of the geographic position of the basin in the far southeast corner of the Adirondacks and to the relatively low elevations (lake level = 319 feet). Both the north and south basins of the lake are close geographically to lowland areas that have supported large numbers of southern species, e.g. black tupelo, tulip poplar, mockernut, red, and bitternut hickory. Adirondack boreal species such as balsam fir and red spruce occur only on higher elevations and some wet or northern exposures.

The objectives of Part II are to present some of the general aspects of the phytosociology and structure of the vegetation in the basin and to compare the present vegetation to previous characterizations. An understanding of the nature of the vegetation and how it attained its present state would seem to be essential to a study which purports to plan for the management of a body of water as important as Lake George.

B. DATA ANALYSIS

The analysis includes summaries intended to give general phytosociological characteristics of the sample including relative values of presence, basal area, density and importance value. Relative importance is defined as the average of relative density and relative basal area.

The random sample for the south basin is analyzed including a preliminary consideration of distributions of age estimates and species importance versus altitude and slope aspect. An attempt to measure sample completeness is made with an analysis of running means using randomly chosen five group stands.

Maps of the leading dominants, summarizing importance values of hemlock, white pine, oaks, birch, and aspen are prepared to give an idea of horizontal variation within the basin. Maps of density and basal area for the random sample are given to illustrate horizontal variation.

C. COMPOSITION OF THE CANOPY VEGETATION

The total sample of 100 stands contains three groups as explained in Part I (Nicholson, et al, 1971). These are the south basin random sample (63 stands), north basin random sample (12 stands) and the non-random group (25 stands). The north basin randomly selected sample of 23 stands was not completed so that only the south basin sample was truly random. For this reason some summaries contain only data for the south basin random sample.

Occurrence of the 35 woody species recorded as trees in the vegetation sample (stems $\geq$ 10.2 cm, dbh) is summarized in Table 1. All 35 species were found in the 75 stand random sample, and all but two (pear and alder) occurred as trees in the 63 south basin stands. Twenty-four of the 35 species were found in the 12 north basin stands sampled.

Hemlock was the most common species, being recorded in 54 of the 75 stands in the random sample (72.0%). Four other species were tallied in at least half the sampled stands: sugar maple (52 stands, 69.3%), white pine (48 stands, 64.0%), and red maple and northern red oak, 43 stands each (57.3%). Other frequently encountered species included: beech (48.0%), paper birch (46.7%), white ash and sweet birch (44.0%), yellow birch (36.0%), and ironwood (34.7%). Thirteen species were considered "rare" in that they were found in three or fewer stands ($\leq$ 4.0%).

Relative density and relative dominance (% basal area) for the leading tree species are listed in Table 2 and summarized in Tables 3-4. In several cases the leading species in density differs from the leader in basal area. Table 3 summarizes the degree to which various species were leading in density in the sample. Hemlock was by far the leading species in relative density, being first in 24 of the random stands (32.0%). Only two other species, white pine (10 stands, 13.3%) and beech (9 stands, 12.0%) were leading in more than 10% of the random stands. Six other species, northern red oak (7, 9.3%), red and sugar maple (6, 8.0%), shagbark hickory and white oak (3, 4.0%), white ash (2, 2.7%) led in density in at least two stands, and 6 others (paper birch), large-toothed aspen, American elm, white spruce, black oak, and ironwood) led in one stand (1.3%). Three stands (4.0%) had no tree dominants. Proportions of stands dominated by the various tree species did not differ appreciably between the north and south basin samples with 11.5 percentage points the maximum difference. This was for the most common species, hemlock (41.7% versus 30.2%).

Proportions of stands with various tree dominants based on % relative basal area are given in Table 4. Again, hemlock dominated the most stands in basal area for the random sample (20 stands, 26.7%), while three other species led in basal area in at least 10% of the sample. These were white pine (13 stands, 17.3%), northern red oak (10, 13.3%), and beech (8, 10.7%). Other than sugar maple (6, 8.0%), none of the other 11 species dominated more than 3 stands. The remaining species included: white ash (3, 4.0%), red maple and white oak (2, 2.7%), and black oak, shagbark hickory, sweet birch, and large-toothed aspen (1, 1.3%). As in the case of density, north and south basin samples differed little (≤9.5 percentage points for any one species) in their percentage composition.

D. SOME CHARACTERISTICS OF THE SOUTH BASIN RANDOM SAMPLE

1. <u>Age Characteristics</u>.

The south basin random sample of 63 stands contains three highly managed sites (two lawns and a pasture) which contained no tree species. It also contains three plantations, one site selectively logged a few days before sampling and an alder swamp containing only five trees. These were eliminated from the analysis in this section. The sample can still not be considered "undisturbed" since it contains a great deal of stands logged within the past twenty years.

A summary of the age and size distribution of this sample is given in Table 5. The average ring count is not a good estimate of the average age since the five to ten trees which were cored were generally the largest trees of the leading species. The estimated time since disturbance was based upon qualitative features of the stand. The average tree size may be a fairly good age indicator especially for the hardwood species since it was found that it correlated well with actual age from ring count.

The data for estimated time since disturbance in Table 5a shows about 40% of the sample to be rather recently disturbed (usually the estimate was 20 or 30 years). The large group in the 41-50 year range was mostly estimated at 50 years. Much of this evidence comes from historical records or from speaking to landowners. The group of ten stands in the 51-75 year range was mostly for stands on state lands where the purchase date is known and descriptions of the area are sometimes available.

Ring count data in Table 5b verifies that much of the recent logging was selective and many young trees were probably left standing. Clear-cutting practice in the basin has not been common for about fifty years. Size data in Table 5c shows that most of the sample averaged in the 21-25 cm (about 8 to 10 inches) range. Analysis of size distributions will be later used to check disturbance characteristics.

2. Species Composition.

Relative presence and importance value for the eighteen leading species are given in Table 6. Presence data will not correspond exactly with Table 1 because five stands were removed for Table 6 and Table 1 includes three non-forested sites. Common species such as sugar maple, red maple, paper birch, yellow birch, white ash, sweet birch and hop hornbeam had low values of importance per occurrence in a stand as shown in the last column of Table 6. Relatively uncommon black oak and striped maple were important when they did occur in the stand.

Hemlock and white pine were the leading species and the only conifers besides red spruce in the sample. The common hardwoods, beech and sugar maple, were important species but northern red oak, white oak and hickory were important on the dry slopes especially in the southern end of the basin.

3. Sample "Stability".

One of the main objectives of the random sample was to obtain a total picture of the vegetation in the basin for simulation of nutrient balance under a variety of treatments. Such a study should include estimates of the extent of a variety of disturbances as well as composition of the sample, but the sample should be tested for reliability. This has not yet been done, but one simple procedure for testing completeness with regard to composition is illustrated in Table 7. Randomly selected groups of five stands are averaged for species RIV and running means of the groups are listed in the table. Perhaps a valid test of sample "stability" would be the number of samples after which a species remains within an acceptable limit (say ± 10%) of its final value. This is given in the last two rows of Table 7 for 5% and 10% limits. The common species reach the ± 10% limits after only a few stands but the rare species, especially those which are important when they do occur, are not easily sampled by this criteria. This of course does not invalidate the sample for most uses since over 80% of the total RIV of the sample met the 10% limit criteria and over 75% met the 5% criteria. Better procedures to estimate sample "stability" would include an analysis of variance, but this has not yet been done. The random sample allows such a rigorous test.

4. Physiographic Variation.

Variation of mean RIV by altitude groups is given in Table 8. No test for reliability of the means was made but certain patterns are evident. The expected low altitude preference for the oaks and white pine is indicated. The latter species was most important for the 200 m range on well-drained sites and somewhat less important in the lowland. A high altitude preference is indicated for the northern hardwood species such as beech, sugar maple, red maple, paper birch and yellow birch.

There seems to be some inconsistency in the altitude variation of hemlock and white pine. Hemlock has a high mean RIV for the 100 m range but very low for the 200 m range. Mean RIV for white pine shows the reverse being exceptionally high at the 200 m range. Hemlock tends to reach high RIV on sloping sites while white pine prefers level areas. Table 9 shows that low slopes are common for the 200 m range while less common for the 100 m range of the sample. Five stands in the 200 m range have white pine leading in RIV with an average slope of only 3.8 degrees. In the 100 m range white pine leads in only one stand with a slope of three degrees. On the other hand, stands in which hemlock leads in RIV have a mean slope of 14.2 degrees (seven cases) for the 100 m range and 10.0 degrees (two cases) for the 200 m range.

To explore the altitude-slope relationship further Table 10 presents the mean slope for stands in which the five leading species are either first or second in RIV. It would seem to be statistically evident that white pine is successful on the level sites in the Lake George drainage basin while hemlock prefers sloping ground.

The slope-aspect variation for the ten leading species is illustrated in Table 11. Again, statistical tests for reliability are not included but some obvious patterns emerge. Hemlock reaches high importance on north- and south-facing sites. Perhaps this reflects the ability of the species to survive extremes of the moisture regime. Of the seven south-facing sites hemlock is the leading species in three and second in one stand with an average slope of 16.5 degrees for the four sites. Thus the high mean RIV for hemlock on the south-facing sites may reflect the small sample size.

White pine shows little tendency to vary with slope-aspect except that it may be significantly low on north-facing sites. The northern hardwoods including beech, sugar maple, red maple, paper birch and yellow birch appear to favor north- or east-facing sites. The dry hardwoods including northern red oak, white oak and white ash tend to reach high RIV on south- or west-facing sites.

There were only four sites with no measurable slope. White pine is the most important species which would seem to be statistically reliable. The very low mean RIV for hemlock and beech and relatively high value for sugar maple on these level sites agrees with differences found earlier, but may not prove to be significant because of the small sample size of four stands.

In summary, the physiographic variation within the random sample reflects characteristics of the leading species which are relatively well-known. The study indicates that these characteristics could probably be proven with appropriate statistics since the sample was random. We have not done this because it is hoped that the eleven north-basin random sites could be added before the analysis is made. This would give a total sample of 86 stands.

E. COMPARISON WITH OTHER VEGETATION MEASUREMENTS

Previous studies of vegetation in the Lake George region have usually been too qualitative to compare with the sample from the drainage basin. In general, they have presented maps of vegetation types which are rather vague. One map does not mention a hemlock "type" but divides the basin into "white pine" and "birch-aspen" types with a small amount of northern hardwoods.

One study, the Northeastern Forest Experiment Station by Ferguson and Mayer (1970) (NEFES) gives a summary by county. The drainage basin is in both Washington and Warren Counties so averaged values for these two counties are compared against "forest types" of our sample. The definitions used were the same as given by Ferguson and Mayer (1970) and used by NEFES. A summary is given in Table 12. The last column compares the NEFES estimate with the various breakdowns of the Lake George sample.

Estimates of forest type areas in Warren and Washington County by NEFES appear to differ from our findings for three forest types, "white pine-red pine-hemlock," "elm-ash-red maple," and "spruce-fir" as illustrated in Table 12. The NEFES estimated that pine-hemlock stands covered only 18.4% "commercial forest land" in Warren-Washington counties, but our data indicate this type to be much more important in the Lake George basin, accounting for about 42% of forested stands. In contrast the NEFES estimates for elm-ash-red maple (17.2%) and spruce fir (7.3%) are high compared to our results (2.8%, 0.0%).

Over half (14 of 27) east-side stands were dominated by hemlock. Oak stands occur throughout the basin, but are most prevalent at low altitudes in the north basin, medium elevations in most of the south basin, and at relatively high altitudes in the southernmost portion of the basin. White pine is clearly best developed on the west side of the basin, and failed to achieve dominance in any of the stands from the eastern side of the basin. Maple-beech-birch stands show an affinity for higher elevations and the western side of the basin. Only one stand of this type in the sample was found within one mile of the lake shore; and only three came from the east side. Oak-pine, in the definition of NEFES ($>$ 50% oak, 25-50% pine by basal area) is a rare combination and is most likely found in the southwestern quarter of the basin. Aspen-birch is present in scattered locations where disturbance (fire and logging) has been especially severe; the most extensive areas are found in the northwestern quarter of the basin. Shagbark hickory stands are not recognized by NEFES, but are prevalent in the southeast quadrant of the basin.

The large percentages of elm-ash-red maple and spruce-fir in the NEFES estimates do not agree with observed vegetation patterns in the basin. The elm-ash-red maple type is mainly restricted to a few severely disturbed lowland areas and the borders of marshes, but is well developed in the lower reaches of Washington County (24.8% county-wide). Spruce-fir as a type is very rare in the basin; there are only a few scattered stands in isolated, high elevation areas. Spruce-fir is much better represented in the northwest part of Warren County which is part of the Adirondack Mountains. According to NEFES it constitutes 14.6% of Warren County commercial forest area.

F. HORIZONTAL VARIATION

Aspects of the horizontal variation of the vegetation sample are presented in a series of maps in Figures 1 through 7. The purpose is to illustrate some basin-wide patterns which may be useful to the aquatic studies. A more quantitative breakdown of distribution of various compositional components and disturbance types by area and watershed would be useful, but has been eliminated from the Lake George program.

The symbol for the most important canopy species of each stand for the random sample only is plotted at the stand location in Figure 1. A prominent feature is the concentration of hemlock (H) in the central portion of the basin particularly on the east side. In contrast white pine-dominated stands (WP) are restricted to the western side of the drainage basin. Other species, mainly northern hardwoods such as beech (B), sugar maple (SM), and northern red oak (NR) appear to be less obviously patterned.

When importance values of hemlock and white pine are plotted for individual stands (Figures 2, 3) east-west contrasts suggested in Figure 1 are even further accentuated. In the south basin, eastern stands have more than twice the amount of hemlock found in western stands, and the difference, by a t-test, is highly significant ($p < .01$). White pine exhibits the opposite trend, being almost four times as important in western stands than in their eastern counterparts in the south basin. Differences between east and west side stands in the south basin are also highly significant for white pine.

Importance values of oaks (lumped together), shown in Figure 4, fail to suggest the regular patterns shown by hemlock and white pine. Aspen and birch species (also combined) likewise exhibit an irregular pattern as shown in Figure 5. Further treatment of the data, planned for the future, may shed more light on explanations for species distributions in the basin.

In Figures 6 and 7 two characteristics of the canopy size class, density (canopy stems/hectare), and basal area (m^2/hectare), are plotted over the drainage basin. Obvious patterns are not apparent. Perhaps the most noticeable characteristic of both maps is the high degree of consistency shown by stands located on the east side between the "narrows" and the midpoint of the lower lake arm. For example, 11 of these stands have a coefficient of variation of mean basal area equal to 0.15, while stands from the west side have a C. V. three times as large. The high similarity among the east side stands may reflect similar environmental conditions, disturbance history, or present levels of disturbance, or, most probably, all three of these factors. Future analysis of the data should help provide a better explanation.

The data presented in this brief report represent only highlights and quickly reduced fractions of the large volume collected. Not even mentioned were the other three stratal classes (ground layer, shrub, and understory), the relationship of the vegetation to environmental factors, succession, or disturbance. It is hoped that more information can be presented in the near future.

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Table 1a. Percent presence of canopy species for the Lake George drainage basin vegetation sample. See Table 1b for scientific names.

		Random Sample						Non Random Sample		Total Sample	
		South Basin		North Basin		Total Random					
	Tree Species	Number	%	Number	%	Number	%	Number	%	Number	%
1.	Hemlock	48	76.2	6	50.0	54	72.0	5	25.0	59	59.0
2.	Sugar Maple	43	68.3	9	75.0	52	69.3	5	20.0	57	57.0
3.	White Pine	43	68.3	5	41.7	48	64.0	3	12.0	51	51.0
4.	Red Maple	37	58.7	6	50.0	43	57.3	4	16.0	47	47.0
5.	Northern Red Oak	35	55.6	8	66.7	43	57.3	3	12.0	46	46.0
6.	Beech	32	50.8	4	33.3	36	48.0	3	12.0	39	39.0
7.	Paper Birch	28	44.4	7	58.3	35	46.7	4	16.0	39	39.0
8.	Sweet Birch	30	47.6	3	25.0	33	44.0	4	16.0	37	37.0
9.	White Ash	24	38.1	9	75.0	33	44.0	2	8.0	35	35.0
10.	Yellow Birch	23	36.5	4	33.0	27	36.0	2	4.0	29	29.0
11.	Ironwood	21	33.3	5	41.7	26	34.7	1	4.0	27	27.0
12.	White Oak	15	23.8	2	16.7	17	22.7	0	0.0	17	17.0
13.	Basswood	11	17.5	4	33.0	15	20.0	2	8.0	17	17.0
14.	Shagbark Hickory	12	19.0	1	8.3	13	17.3	0	0.0	13	13.0
15.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16.	Black Oak	9	14.3	1	8.3	10	13.3	0	0.0	10	10.0
17.	Striped Maple	8	12.7	1	8.3	9	12.0	1	4.0	10	10.0
18.	Black Cherry	5	7.9	3	25.0	8	10.7	0	0.0	8	8.0
19.	Red Spruce	7	11.1	0	0.0	7	9.3	0	0.0	7	7.0
20.	Shad Spp.	6	9.5	1	8.3	7	9.3	1	4.0	8	8.0
21.	American Elm	2	3.2	3	25.0	5	6.7	1	4.0	6	6.0
22.	White Cedar	4	6.3	0	0.0	4	5.3	2	8.0	6	6.0
23.	Bitternut Hickory	1	1.6	3	25.0	4	5.3	0	0.0	4	4.0
24.	Butternut	3	4.8	0	0.0	3	4.0	1	4.0	4	4.0
25.	Trembling Aspen	3	4.8	0	0.0	3	4.0	1	4.0	4	4.0
26.	None	3	4.8	0	0.0	3	4.0	16	64.0	19	19.0
27.	Red Pine	2	3.2	1	8.3	3	4.0	2	8.0	5	5.0
28.	Black Ash	1	1.6	2	16.7	3	4.0	0	0.0	3	3.0
29.	Chestnut Oak	2	3.2	0	0.0	2	2.7	0	0.0	2	2.0
30.	Gray Birch	2	3.2	0	0.0	2	2.7	0	0.0	2	2.0
31.	Mountain Maple	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
32.	Hornbeam	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
33.	White Spruce	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
34.	Apple	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
35.	Alder	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
36.	Pear	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0

Table 1 b - Species Nomenclature after Fernald (1950)

Common Name	Scientific Name
Hemlock	Tsuga canadensis (L.) Carr.
Sugar Maple	Acer saccharum Marsh.
White Pine	Pinus strobus L.
Red Maple	Acer rubrum L.
Northern Red Oak	Quercus rubra L. Var. borealis (Michx. f.) Farw.
Beech	Fagus grandifolia Ehrh.
Paper Birch	Betula papyrifera Marsh.
Sweet Birch	Betula lenta L.
White Ash	Fraxinus americana L.
Yellow Birch	Betula lutea Michx. f.
Ironwood	Ostrya virginiana (Mill.) K. Koch
White Oak	Quercus alba L.
Basswood	Tilia americana L.
Shagbark Hickory	Carya ovata (Mill.) K. Koch
Large-toothed Aspen	Populus grandidentata Michx.
Black Oak	Quercus velutina Lam.
Striped Maple	Acer pensylvanicum L.
Black Cherry	Prunus serotina Ehrh.
Red Spruce	Picea rubens Sarg.
Shad	Amelanchier Medic.
American Elm	Ulmus americana L.
White Cedar	Thuja occidentalis L.
Bitternut Hickory	Carya cordiformis (Wang.) K. Koch
Butternut	Juglans cinerea L.
Trembling Aspen	Populus tremuloides Michx.
None	
Red Pine	Pinus resinosa Ait.
Black Ash	Fraxinus nigra Marsh.
Chestnut Oak	Quercus prinus L.
Gray Birch	Betula populifolia Marsh.
Mountain Maple	Acer spicatum Lam.
Hornbeam	Carpinus caroliniana Walt.
White Spruce	Picea glauca (Moench) Voss
Apple	Pyrus malus L.
Alder	Alnus cugosa (Du Roi) Spreng
Pear	Pyrus communis L.

Table 2. Leading canopy species in relative density and relative basal area for each stand in the Lake George drainage basin sample.

Stand No.	Leading Tree Species of Stand (Density)	Relative Density (% Stems)	Leading Tree Species of Stand (Basal Area)	Relative B.A. (% B.A.)
GROUP I - RANDOM, SOUTH BASIN (n = 63):				
1	White Oak-Black Oak	38.5	White Oak	45.3
2	White Oak	57.9	White Oak	62.9
3	Hemlock	60.4	Hemlock	50.9
4	Shagbark Hickory	46.5	No. Red Oak	36.9
5	No. Red Oak	73.0	No. Red Oak	81.7
6	None	--	None	--
7	None	--	None	--
11	Red Maple	32.0	No. Red Oak	44.6
12	White Oak	30.6	Black Oak	39.3
13	White Pine	22.7	White Pine	37.4
14	Sugar Maple	37.3	Sugar Maple	25.7
15	Hemlock	27.3	Hemlock	51.8
16	No. Red Oak	59.8	No. Red Oak	66.4
17	Shagbark Hickory	52.2	Shagbark Hickory	50.9
20	White Spruce	55.6	White Pine	41.6
21	Hemlock	40.7	Hemlock	32.2
22	White Pine	45.2	White Pine	71.7
23	Beech	31.8	Beech	37.6
24	White Ash	59.1	White Ash	50.2
25	Hemlock	49.1	Hemlock	46.0
26	Hemlock	64.1	Hemlock	46.7
32	Shagbark Hickory	17.1	White Ash	22.2
33	White Pine	54.8	White Pine	63.8
37	White Pine	72.7	White Pine	88.6
38	White Pine	27.1	White Pine	33.4
39	Hemlock	51.6	Hemlock	51.5
40	Sugar Maple	47.7	Sugar Maple	51.9
41	No. Red Oak	38.8	No. Red Oak	41.9
42	No. Red Oak	67.4	No. Red Oak	73.6
43	Hemlock	30.9	Sugar Maple	35.7
44	Hemlock	38.9	Hemlock	47.4
45	Hemlock	31.1	Hemlock	48.8
48	No. Red Oak	51.2	No. Red Oak	70.8
49	Beech	42.9	Beech	45.7
50	Red Maple	30.4	Red Maple	32.5

Table 2.- Continued

Stand No.	Leading Tree Species of Stand (Density)	Relative Density (% Stems)	Leading Tree Species of Stand (Basal Area)	Relative B.A. (% B.A.)
GROUP I - RANDOM, SOUTH BASIN (n = 63) - CONTINUED:				
51	Hemlock	57.9	Hemlock	66.6
54	Beech	39.7	Hemlock	35.0
55	Sugar Maple	46.7	Sugar Maple	59.9
62	Red Maple	40.0	White Pine	62.2
65	Red Maple	41.8	White Pine	38.7
66	White Pine	35.1	White Pine	46.5
68	Sugar Maple	48.6	Beech	56.1
71	No. Red Oak	36.9	No. Red Oak	46.1
72	Paper Birch	44.2	Paper Birch	61.2
73	Sugar Maple-Beech	24.3	Sugar Maple	54.8
74	Hemlock	34.9	Beech	35.4
75	White Pine	36.2	Paper Birch	39.8
76	Hemlock	51.0	Hemlock	35.5
81	White Pine	97.1	White Pine	98.7
82	Red Maple	31.5	Red Maple	24.3
84	Beech	56.2	Str. Map.-Bl. Birch	23.3
85	Beech-Hemlock	34.1	Beech	38.7
86	Red Maple	29.5	White Pine	20.2
88	Hemlock	72.7	Hemlock	71.4
89	Hemlock	70.6	Hemlock	66.1
90	Hemlock	50.0	Hemlock	32.5
92	Hemlock	51.7	Hemlock	44.4
95	Hemlock	71.3	Hemlock	75.0
96	Hemlock	37.2	Beech	26.3
97	Beech	32.1	Beech	36.8
98	Beech	51.1	Sugar Maple	47.5
99	White Pine	39.5	White Pine	80.1
100	None	--	None	--

Table 2.- Continued

Stand No.	Leading Tree Species of Stand (Density)	Relative Density (% Stems)	Leading Tree Species of Stand (Basal Area)	Relative B.A. (% B.A.)
GROUP II - RANDOM, NORTH BASIN (n = 12):				
18	White Pine	37.9	White Pine	86.5
19	Large Tooth Aspen	39.0	Large Tooth Aspen	84.8
27	Hemlock	60.9	Hemlock	44.8
28	No. Red Oak	43.6	No. Red Oak	43.3
29	Hemlock	49.1	Yellow Birch	38.4
30	Hemlock	55.6	Hemlock	48.4
31	Beech	41.1	Beech	40.7
34	White Pine	69.0	White Pine	84.2
35	Sugar Maple	35.4	No. Red Oak	50.9
36	Hemlock	46.8	Hemlock	51.4
46	Hem.-Ironwood	82.9	Hemlock	31.2
47	American Elm	38.1	American Elm	34.7
GROUP III - NON RANDOM (n = 25):				
8	None	--	None	--
9	White Pine	87.5	White Pine	91.6
10	White Pine	35.0	White Pine	73.2
52	Hemlock	66.2	Hemlock	55.2
53	Beech	40.0	Beech	31.9
56	Hemlock	64.9	Hemlock	77.8
57	Paper Birch	100.0	Paper Birch	100.0
58	None	--	None	--
59	None	--	None	--
60	None	--	None	--
61	Trembling Aspen	100.0	Trembling Aspen	100.0
63	None	--	None	--
64	None	--	None	--
67	Hemlock	51.2	White Pine	35.8
69	None	--	None	--
70	None	--	None	--
77	None	--	None	--
78	None	--	None	--
79	None	--	None	--
80	None	--	None	--

Table 2.- Continued

Stand No.	Leading Tree Species of Stand (Density)	Relative Density (% Stems)	Leading Tree Species of Stand (Basal Area)	Relative B.A. (% B.A.)
GROUP III - NON RANDOM (n = 25):				
83	None	--	None	--
87	None	--	None	--
91	Hemlock	69.3	Hemlock	48.2
93	None	--	None	--
94	None	--	None	--

Table 3. Percent of the Lake George sample for which canopy species were leading in relative density.[1]

	Tree Species	Random Sample: South Basin[1] Number	%	North Basin Number	%	Total Random Number	%	Non Random Sample Number	%	Total Sample Number	%
1.	Hemlock	19*	30.2	5*	41.7	24**	32.0	4	16.0	28**	28.0
2.	White Pine	8	12.7	2	16.7	10	13.3	2	8.0	12	12.0
3.	Beech	8**	12.7	1	8.3	9**	12.0	1	4.0	10**	10.0
4.	Northern Red Oak	6	9.5	1	8.3	7	9.3	0	0.0	7	7.0
5.	Red Maple	6	9.5	0	0.0	6	8.0	0	0.0	6	6.0
6.	Sugar Maple	5*	7.9	1	8.3	6*	8.0	0	0.0	6*	6.0
7.	Shagbark Hickory	3	4.8	0	0.0	3	4.0	0	0.0	3	3.0
8.	White Oak	3*	4.8	0	0.0	3*	4.0	0	0.0	3*	3.0
9.	White Ash	2	3.2	0	0.0	2	2.7	0	0.0	2	2.0
10.	Paper Birch	1	1.6	0	0.0	1	1.3	1	4.0	2	2.0
11.	White Spruce	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
12.	Large-Toothed Aspen	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
13.	American Elm	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
14.	Black Oak	1*	1.6	0	0.0	1*	1.3	0	0.0	1*	1.0
15.	Ironwood	0	0.0	1*	8.3	1*	1.3	0	0.0	1*	1.0
16.	Trembling Aspen	0	0.0	0	0.0	0	0.0	1	4.0	1	1.0
17.	None	3		0		3		16		19	
	Raw Total	66		13		79		25		104	
	Total Number of Stands	63		12		75		25		100	

[1]Asterisks (*) denote cases where leading value was shared.

Table 4. Percent of the Lake George drainage basin sample for which canopy species were leading in relative basal a

		Random Sample						Non Random Sample		Total Sample	
		South Basin		North Basin		Total Basin					
	Tree Species	Number	%	Number	%	Number	%	Number	%	Number	%
1.	Hemlock	16	25.4	4	33.3	20	26.7	3	12.0	23	23.0
2.	White Pine	11	17.5	2	16.7	13	17.3	3	12.0	16	16.0
3.	Northern Red Oak	8	12.7	2	16.7	10	13.3	0	0.0	10	10.0
4.	Beech	7	11.1	1	8.3	8	10.7	1	4.0	9	9.0
5.	Sugar Maple	6	9.5	0	0.0	6	8.0	0	0.0	6	6.0
6.	Paper Birch	2	3.2	0	0.0	2	2.7	1	4.0	3	3.0
7.	Red Maple	2	3.2	0	0.0	2	2.7	0	0.0	2	2.0
8.	White Oak	2	3.2	0	0.0	2	2.7	0	0.0	2	2.0
9.	White Ash	3	4.8	0	0.0	3	4.0	0	0.0	3	3.0
10.	Black Oak	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
11.	Shagbark Hickory	1	1.6	0	0.0	1	1.3	0	0.0	1	1.0
12.	Large-Toothed Aspen	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
13.	Yellow Birch	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
14.	American Elm	0	0.0	1	8.3	1	1.3	0	0.0	1	1.0
15.	Black Birch	1*	1.6	0	0.0	1*	1.3	0	0.0	1*	1.0
16.	Striped Maple	1*	1.6	0	0.0	1*	1.3	0	0.0	1*	1.0
17.	Trembling Aspen	0	0.0	0	0.0	0	0.0	1	4.0	1	1.0
18.	None	3	4.8	0	0.0	3	4.0	16	64.0	19	19.0
	Total	64	101.8*	12	99.9	76	101.2*	25	100.0	101	101.0

[1]Asterisks (*) denote cases where leading value was shared.

Table 5: Distribution of (a) estimated time since disturbance (b) average measured ring count at breast height and (c) diameter at breast height for the South Basin random sample.

(a) Estimated Time Since Disturbance (Yrs.)		(b) Average Number of Ring Counts		(c) Mean Stand Tree dbh (cm)	
Range(Yrs.)	No. of Stands	Range(No.)	No. Stands	Range(cm)	No. Stands
15-20	10	26-50	4	16-20	10
21-30	11	51-75	15	21-25	31
31-40	3	76-100	26	26-30	7
41-50	14	101-125	5	31-35	6
51-75	10	126-150	1	over 35	1
76-100	2	Total No.	51*	Total No.	55
101-150	1	Mean Count	81.5	Mean dbh	26.5
Total No.	51*				
Mean Est. Time	42.6				

*Four stands were not estimated or cored.

Table 6: Relative importance value (RIV) and presence of the leading canopy species for the south basin random sample. Minor species are omitted from the calculation and three disturbed or managed stands are not included.

Species	No. of Stands	Rel. Presence	R.I.V.	RIV per Occurrence
Hemlock	46	84	22.3	26.8
White Pine	33	60	13.0	20.7
No. Red Oak	34	62	11.9	19.2
Beech	31	56	10.8	19.3
Sugar Maple	41	75	10.5	14.0
Red Maple	35	64	7.8	12.2
Paper Birch	27	49	5.2	10.6
White Oak	15	27	3.6	13.3
Yellow Birch	22	40	2.6	6.5
Shagbark Hickory	10	18	2.2	12.2
White Ash	22	40	2.1	5.2
Sweet Birch	28	51	2.0	3.9
Black Oak	8	15	2.0	13.3
Striped Maple	8	15	1.2	8.0
Hop Hornbeam	21	38	1.1	2.9
Basswood	10	18	0.7	3.9
Large-Toothed Aspen	9	16	0.5	3.1
Red Spruce	6	11	0.5	4.5

Table 7. Cumulative running mean of importance value for randomized five stand groupings of the South Basin random sample. The last two rows give the number of stands after which the cumulative mean importance value never is more than ± 10% and ± 5% from the final value (55 stands).

No. of Stands	Hemlock	White Pine	No. Red Oak	Beech	Sugar Maple	Red Maple	Paper Birch	White Oak	Yellow Birch	Shagbark Hickory	White Ash	Sweet Birch	Bass-wood	Strip Maple
5	16.1	11.7	28.4	5.8	11.7	9.4	5.6	1.4	2.8	0.3	2.1	0.5	1.3	--
10	16.4	10.7	18.9	11.1	12.2	8.4	6.3	0.8	2.4	0.6	3.2	3.3	1.3	1.7
15	17.7	11.1	17.6	12.9	11.1	8.2	4.3	1.7	2.3	3.1	3.2	2.8	1.0	1.[illegible]
20	22.0	10.3	14.6	12.2	11.4	7.8	4.4	1.2	2.1	2.3	3.0	2.8	0.9	1.[illegible]
25	14.0	12.6	14.8	11.1	10.4	7.9	5.9	4.0	2.9	1.9	2.5	2.6	0.8	1.[illegible]
30	21.6	12.9	13.4	11.0	11.2	8.0	5.2	3.4	2.5	1.6	2.3	2.5	0.7	1.[illegible]
35	21.3	13.5	13.6	10.0	10.6	8.3	5.3	3.0	2.8	1.7	2.7	2.3	1.1	1.[illegible]
40	22.0	13.1	12.4	11.0	10.9	8.3	5.4	2.7	2.6	1.6	2.4	2.4	1.0	1.[illegible]
45	20.8	13.1	12.6	10.5	10.4	8.4	6.0	3.4	2.4	1.4	2.2	2.3	1.7	0.[illegible]
50	22.8	13.1	11.8	11.1	10.5	8.0	5.5	3.3	2.3	1.3	2.1	2.3	1.5	1.[illegible]
55	22.3	13.0	11.9	10.8	10.5	7.8	5.2	3.6	2.6	2.2	2.1	2.0	1.9	1.[illegible]
Within ± 10%	30	30	40	25	15	10	50	55	55	55	45	55	55	55
± 5%	50	30	50	40	35	50	55	55	55	55	45	55	55	55

Table 8: Mean relative importance value and occurrence of the ten leading canopy species by altitude ranges.

Species	100-199 No.	100-199 Mean	200-299 No.	200-299 Mean	300-399 No.	300-399 Mean	400-499 No.	400-499 Mean	400-558* No.	400-558* Mean
Hemlock	11	30.4	13	16.9	11	22.8	9	17.7	11	19.0
White Pine	11	13.0	12	20.5	8	11.6	1	3.6	2	3.8
Beech	5	2.6	10	10.1	8	10.5	8	23.4	9	22.6
Sugar Maple	8	6.8	13	9.6	12	11.0	8	19.6	8	16.0
No. Red Oak	13	17.9	11	17.2	8	9.2	1	0.2	2	1.6
Red Maple	6	2.5	9	7.1	12	12.6	6	7.2	7	7.7
White Oak	6	8.8	5	1.3	4	3.4	--	---	--	---
White Ash	6	2.7	7	2.6	5	1.6	4	1.8	4	1.4
Paper Birch	5	2.1	5	3.7	9	5.6	6	11.8	8	11.5
Yellow Birch	2	0.7	5	1.7	8	3.7	6	5.0	7	4.9
Number in range	14		16		14		9		11	

*Includes a stand at 540 m and one at 558 m.

Table 9: Proportion of stands in various slope ranges for four altitude ranges.

Slope Range (degrees)	Altitude Range (m)							
	100-199		200-299		300-399		400-558	
	No.	%	No.	%	No.	%	No.	%
0 - 5	4	29	8	50	5	36	5	45
6 - 10	3	21	3	19	3	21	2	18
11 - 15	1	7	1	6	1	7	2	18
16 - 20	5	36	3	19	3	21	2	18
21 - 25	0	0	1	6	1	7	0	0
over 25	1	7	0	0	1	7	0	0
	14	100	16	100	14	99	11	99
Mean Slope (degrees)	12.6		9.3		12.1		8.9	

Mean slope of the total sample is 10.7 degrees.

Table 10: Mean slope of stands for the stands in which tree species were leading in relative importance value. Values are given for only the five most important species.

Species	Mean Slope when Ranked 1st in RIV		Mean Slope when Ranked 2nd in RIV	
	No.	Mean (Deg.)	No.	Mean (Deg.)
Hemlock	16	13.3	9	11.3
White Pine	7	3.3	11	9.0
No. Red Oak	8	10.9	7	12.2
Beech	9	12.3	7	13.0
Sugar Maple	5	9.6	4	16.0

Mean Slope of 55 stand sample is 10.7 degrees.

Table 11: Mean relative importance value and occurrence of the ten leading canopy species by slope aspect ranges.

Species	North		East		South		West		None	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Hemlock	12	21.8	10	15.3	5	32.2	15	18.4	4	7.6
White Pine	5	7.8	8	10.3	6	11.4	11	10.0	3	36.1
Beech	10	19.4	7	9.9	4	4.0	10	8.9	1	5.2
Sugar Maple	8	14.7	13	12.8	5	3.4	12	6.7	2	14.8
No. Red Oak	7	3.9	9	14.5	7	16.5	10	14.7	1	3.1
Red Maple	6	5.8	12	10.6	5	7.0	8	6.0	3	7.5
White Oak	1	3.5	4	1.6	2	1.8	8	6.9	--	---
White Ash	4	1.9	6	2.6	4	4.0	6	1.5	2	1.4
Paper Birch	7	5.3	9	8.8	4	3.7	6	3.1	1	2.6
Yellow Birch	5	2.7	8	3.8	3	1.4	6	1.6	--	---
No. in Range	13		15		7		16		4	
Mean Slope (degrees)	11.7		10.1		13.7		11.8			---

Table 12: Representation of various forest types in the Lake George drainage basin stands.[1]

Forest Type	Random Sample: South Basin Number	South Basin %	North Basin Number	North Basin %	Total Random Number	Total Random %	Non Random Sample Number	Non Random Sample %	Total Sample Number	Total Sample %	NEFES Estimate[2] %
WHITE PINE - RED PINE - HEMLOCK FOREST TYPE:											
1. White Pine	12	20.0	1	8.3	13	18.1	3	33.3	16	19.8	N.A.
2. Hemlock	13	21.7	4	33.0	17	23.6	3	33.3	20	24.7	N.A.
Total	25	41.7	5	41.3	30	41.7	6	66.6	36	44.5	18.4
MAPLE - BEECH - BIRCH											
3. Sugar Maple	7	11.7	1	8.3	8	11.1	0	0.0	8	9.9	N.A.
4. Beech	11	18.3	2	16.7	13	18.1	1	11.1	14	17.3	N.A.
5. Yellow Birch	0	0.0	1	8.3	1	1.4	0	0.0	1	1.2	N.A.
Total	18	30.0	4	33.3	22	30.6	1	11.1	23	28.4	33.7
OAK											
6. Northern Red Oak	6	10.0	1	8.3	7	9.7	0	0.0	7	8.6	N.A.
7. White Oak	2	3.3	0	0.0	2	2.8	0	0.0	2	2.5	N.A.
8. Black Oak	1	1.7	0	0.0	1	1.4	0	0.0	1	1.2	N.A.
Total	9	15.0	1	8.3	10	13.9	0	0.0	10	12.3	12.1
ASPEN BIRCH FOREST TYPE:											
9. Paper Birch	2	3.3	0	0.0	2	2.8	0	0.0	2	2.5	N.A.
10. Large-Toothed Aspen	1	1.7	1	8.3	2	2.8	0	0.0	2	2.5	N.A.
11. Trembling Aspen	0	0.0	0	0.0	0	0.0	2	22.2	2	2.5	N.A.
Total	3	5.0	1	8.3	4	5.6	2	22.2	6	7.5	6.7
ELM - ASH - RED MAPLE FOREST TYPE:											
12. White Ash	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	N.A.
13. American Elm	1	1.7	1	8.3	2	2.8	0	0.0	2	2.5	N.A.
Total	1	1.7	1	8.3	2	2.8	0	0.0	2	2.5	17.2

Table 12-Continued

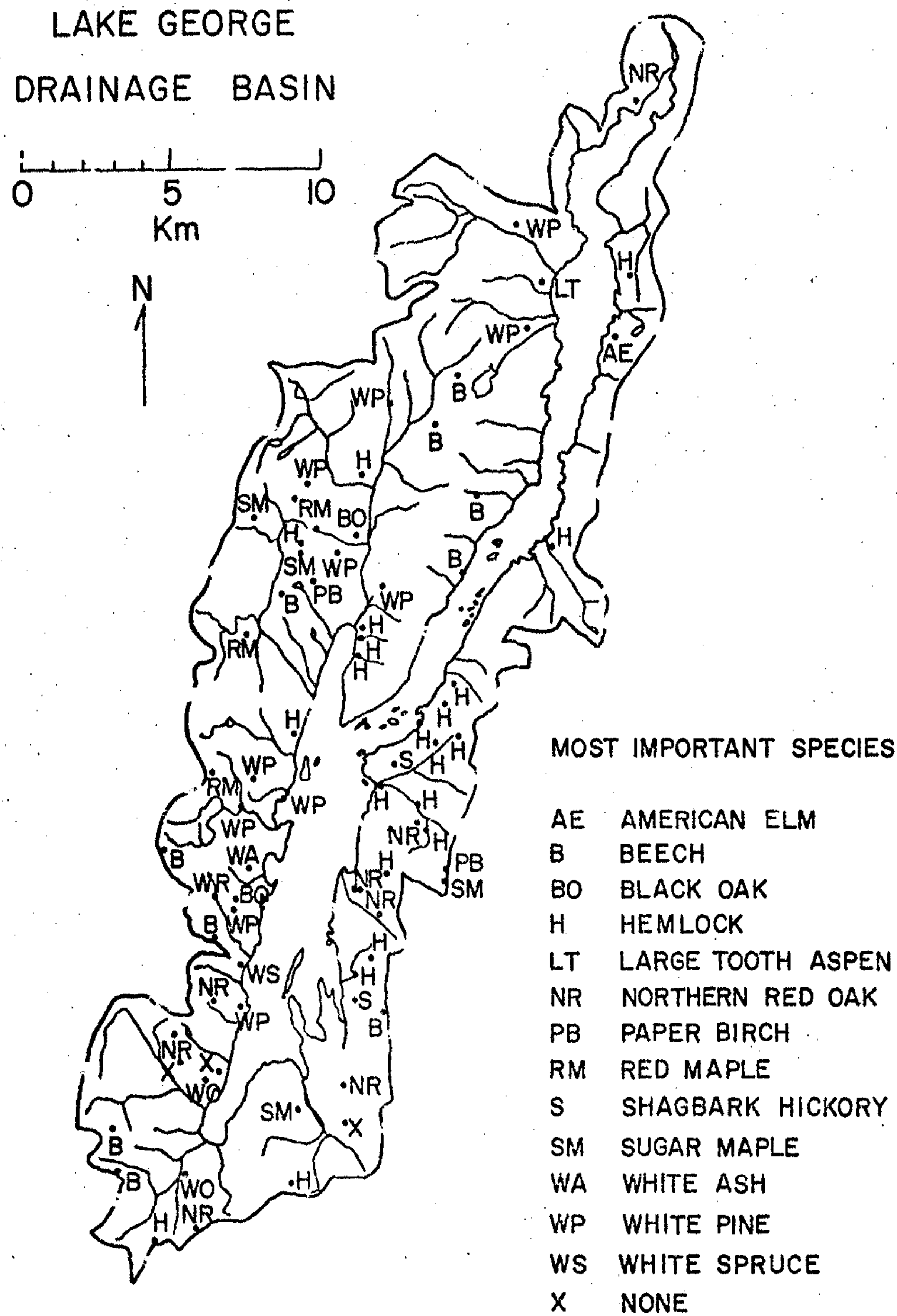
Forest Type	Random Sample: South Basin Number	South Basin %	North Basin Number	North Basin %	Total Random Number	Total Random %	Non Random Sample Number	Non Random Sample %	Total Sample Number	Total Sample %	NEFES Estimate[2] %
OAK - PINE											
14. Black Oak	1	1.7	0	0.0	1	1.4	0	0.0	1	1.2	N.A.
15. Northern Red Oak	1	1.7	0	0.0	1	1.4	0	0.0	1	1.2	N.A.
Total	2	3.4	0	0.0	2	2.8	0	0.0	2	2.4	1.9
16. Shagbark Hickory	2	3.3	0	0.0	2	2.8	0	0.0	2	2.5	0.0
Forest Stand Total	60	100.0	12	99.9	72	100.2	9	100.0	81	100.1	90.0
Non Forest	3	4.8	0	0.0	3	4.0	16	64.0	19	19.0	11.4
Forested	60	95.2	12	100.0	72	96.0	9	36.0	81	81.0	88.6
GRAND TOTAL	63	100.0	12	100.0	75	100.0	25	100.0	100	100.0	100.0

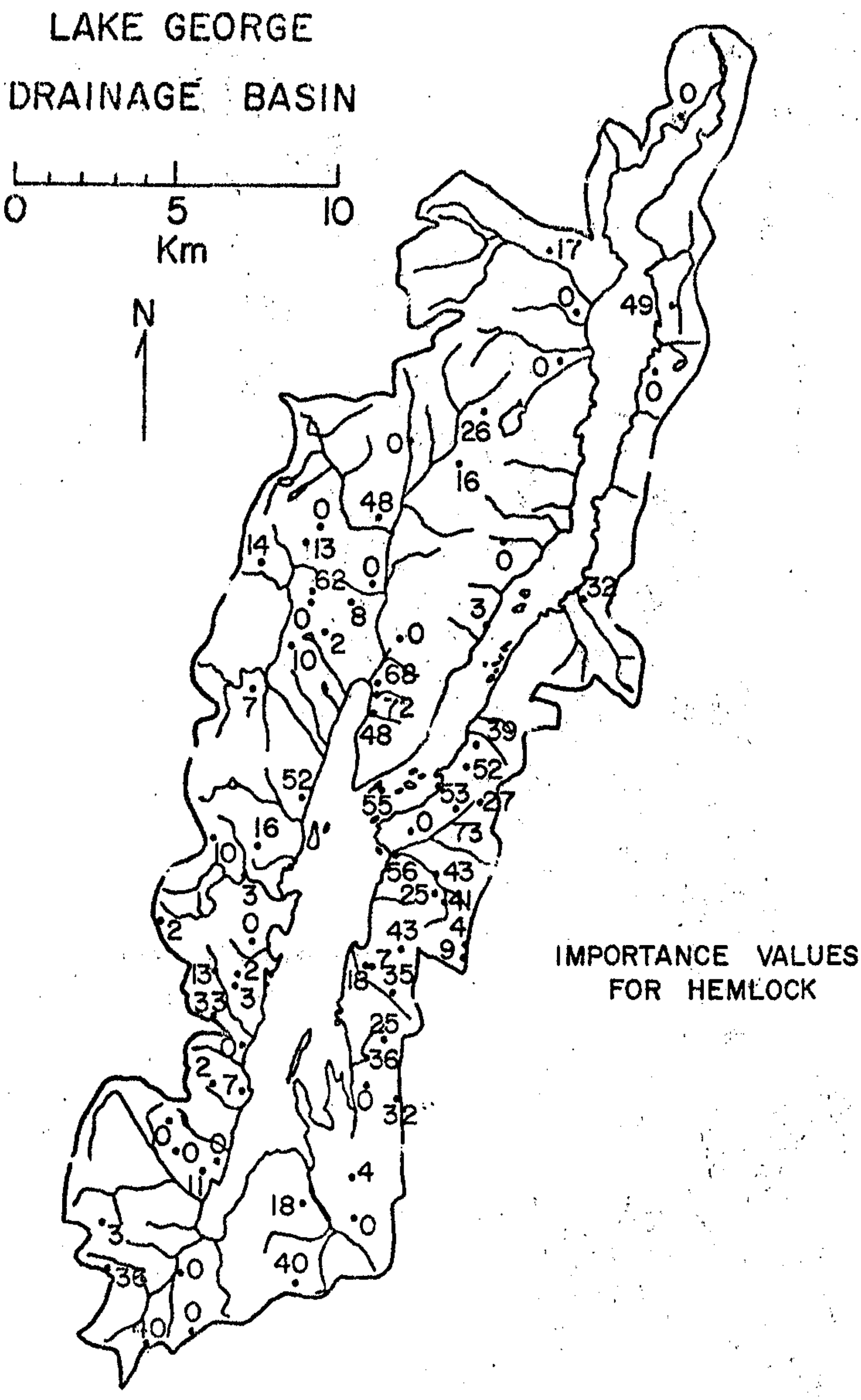
[1]Percentages based on total number of forested stands, "forest types" as defined by Northeastern Forest Experiment Station (Ferguson and Mayer, 1970).

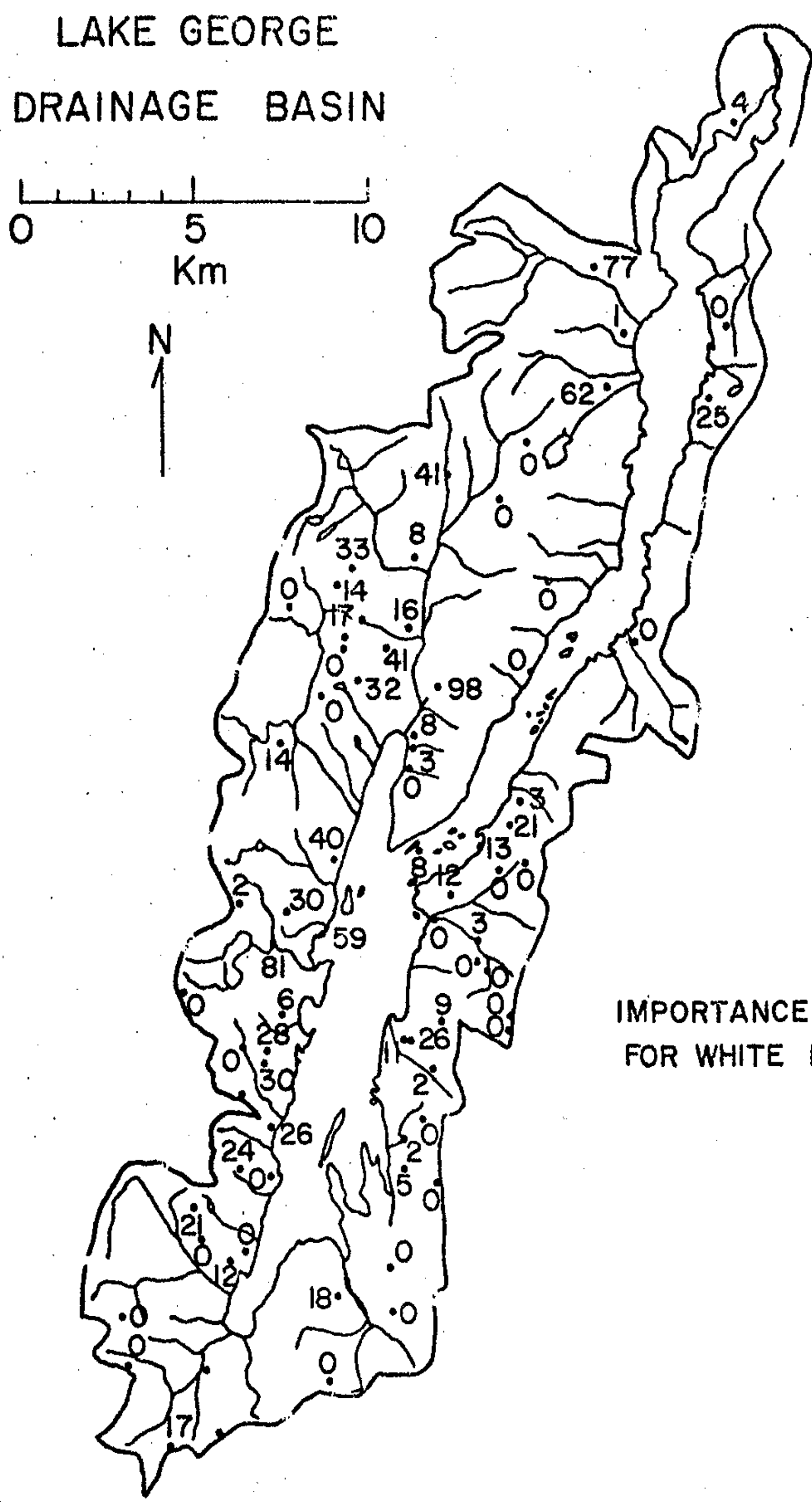
[2]Percentages for commercial forest land in Warren and Washington County (1968), averaged (from Ferguson and Mayer, 1970).

N.A. = Not given.

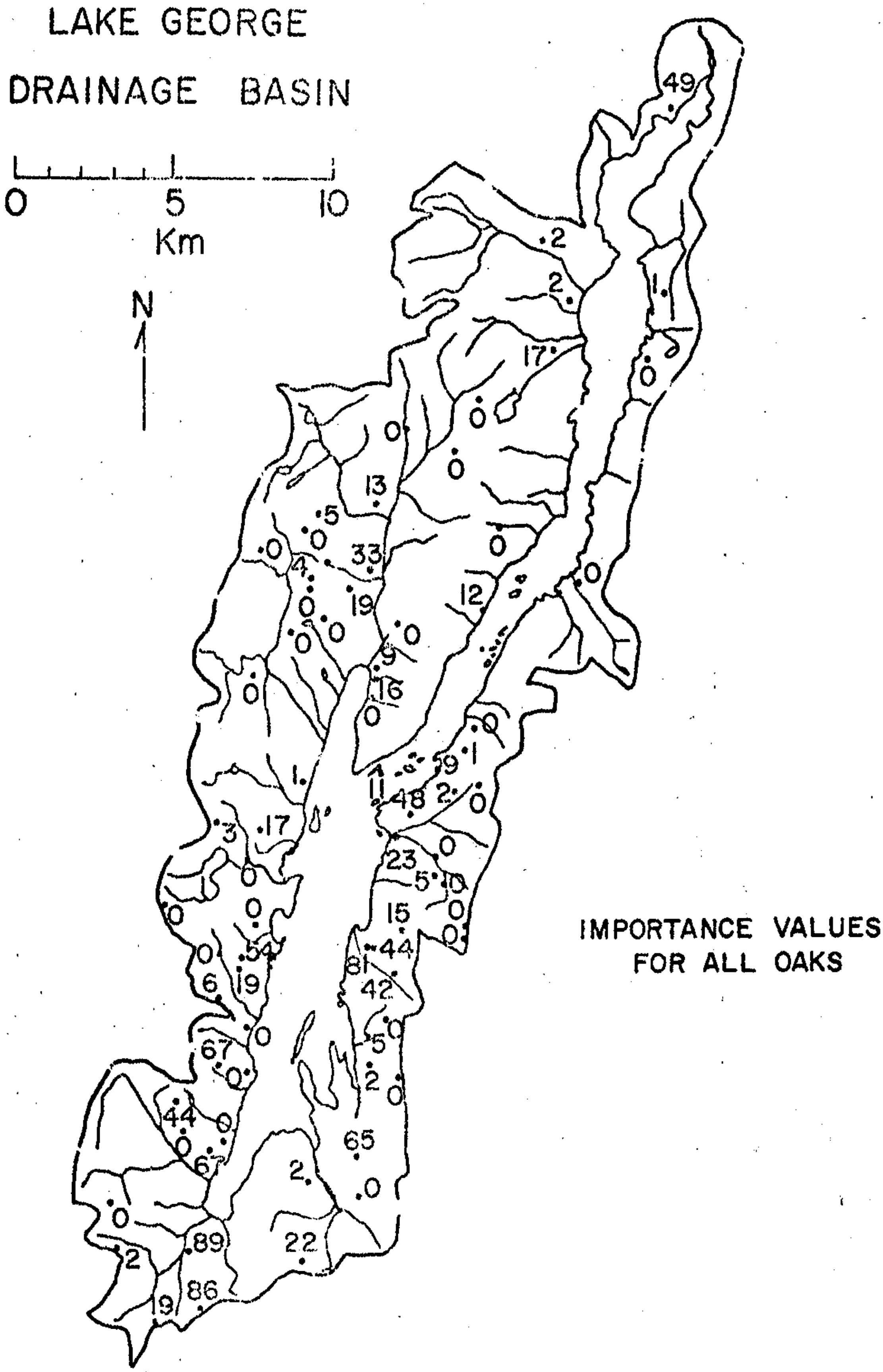
LIST OF FIGURES


LAKE GEORGE
DRAINAGE BASIN
0
5
10
Km
N
MOST IMPORTANT SPECIES
AE AMERICAN ELM
B BEECH
BO BLACK OAK
H HEMLOCK
LT LARGE TOOTH ASPEN
NR NORTHERN RED OAK
PB PAPER BIRCH
RM RED MAPLE
S SHAGBARK HICKORY
SM SUGAR MAPLE
WA WHITE ASH
WP WHITE PINE
WS WHITE SPRUCE
X NONE


LAKE GEORGE
DRAINAGE BASIN
0
5
10
Km
N
IMPORTANCE VALUES
FOR HEMLOCK

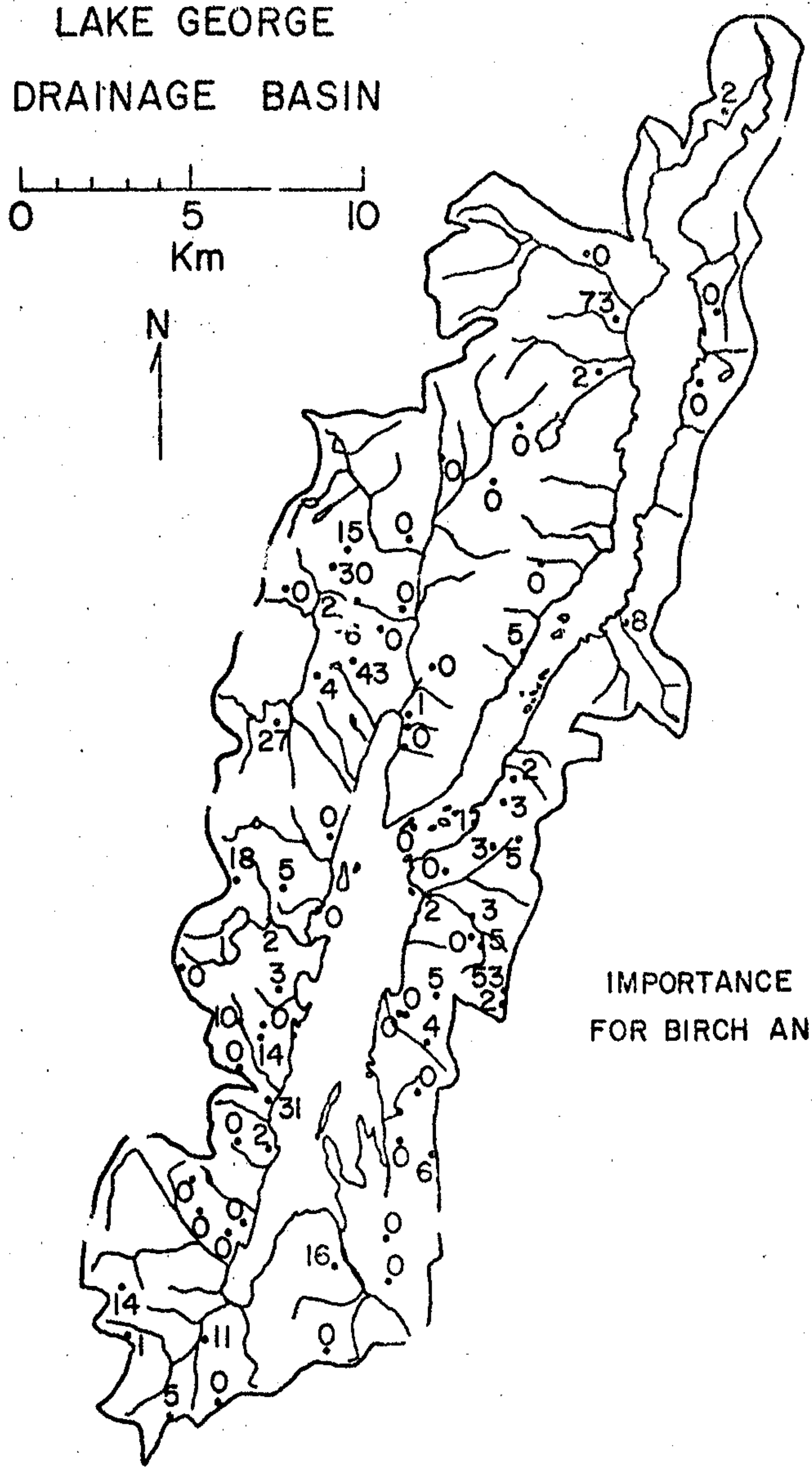


IMPORTANCE VALUES
FOR WHITE PINE

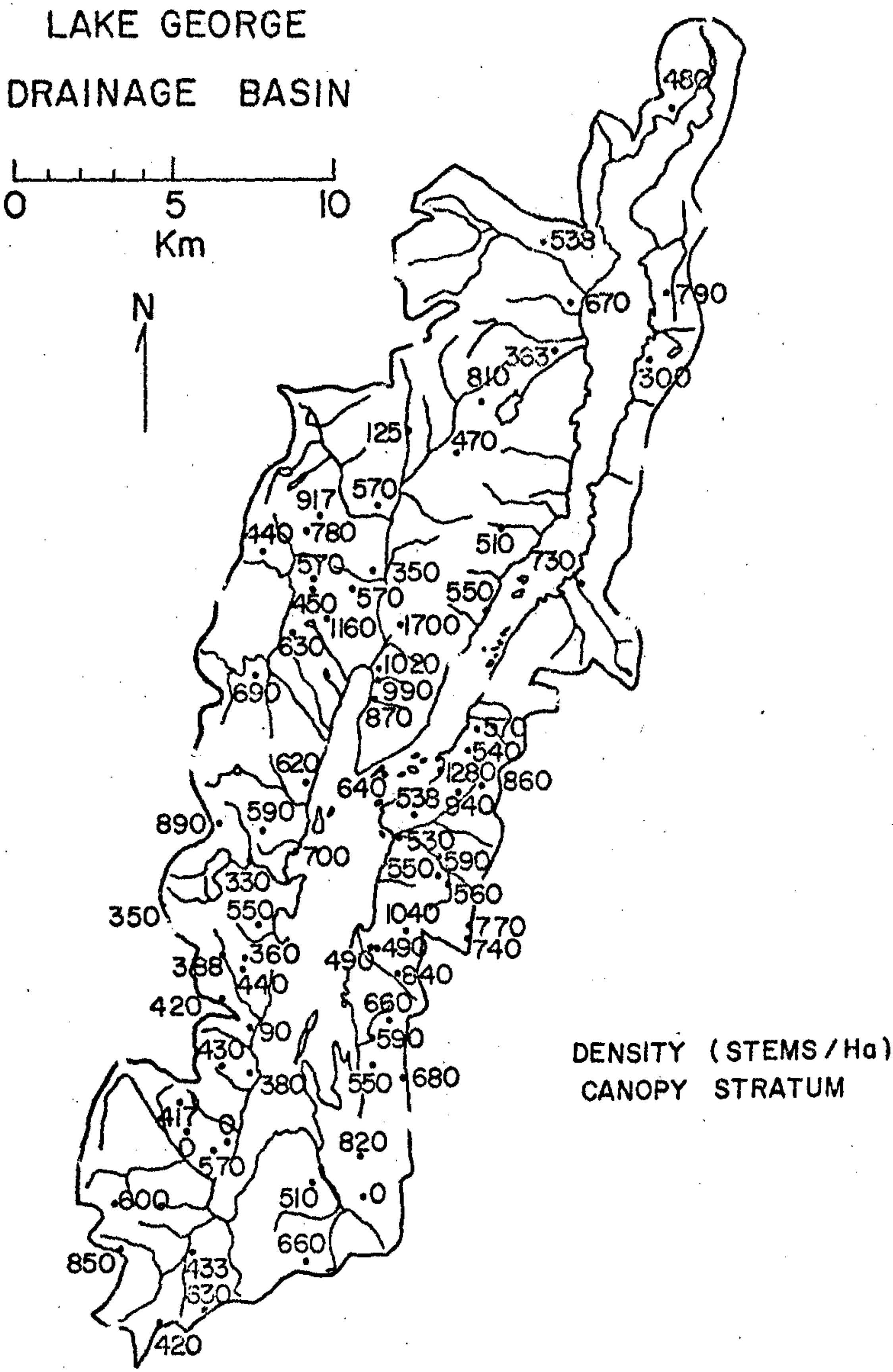

LAKE GEORGE
DRAINAGE BASIN
0 5 10
Km
N
IMPORTANCE VALUES
FOR ALL OAKS

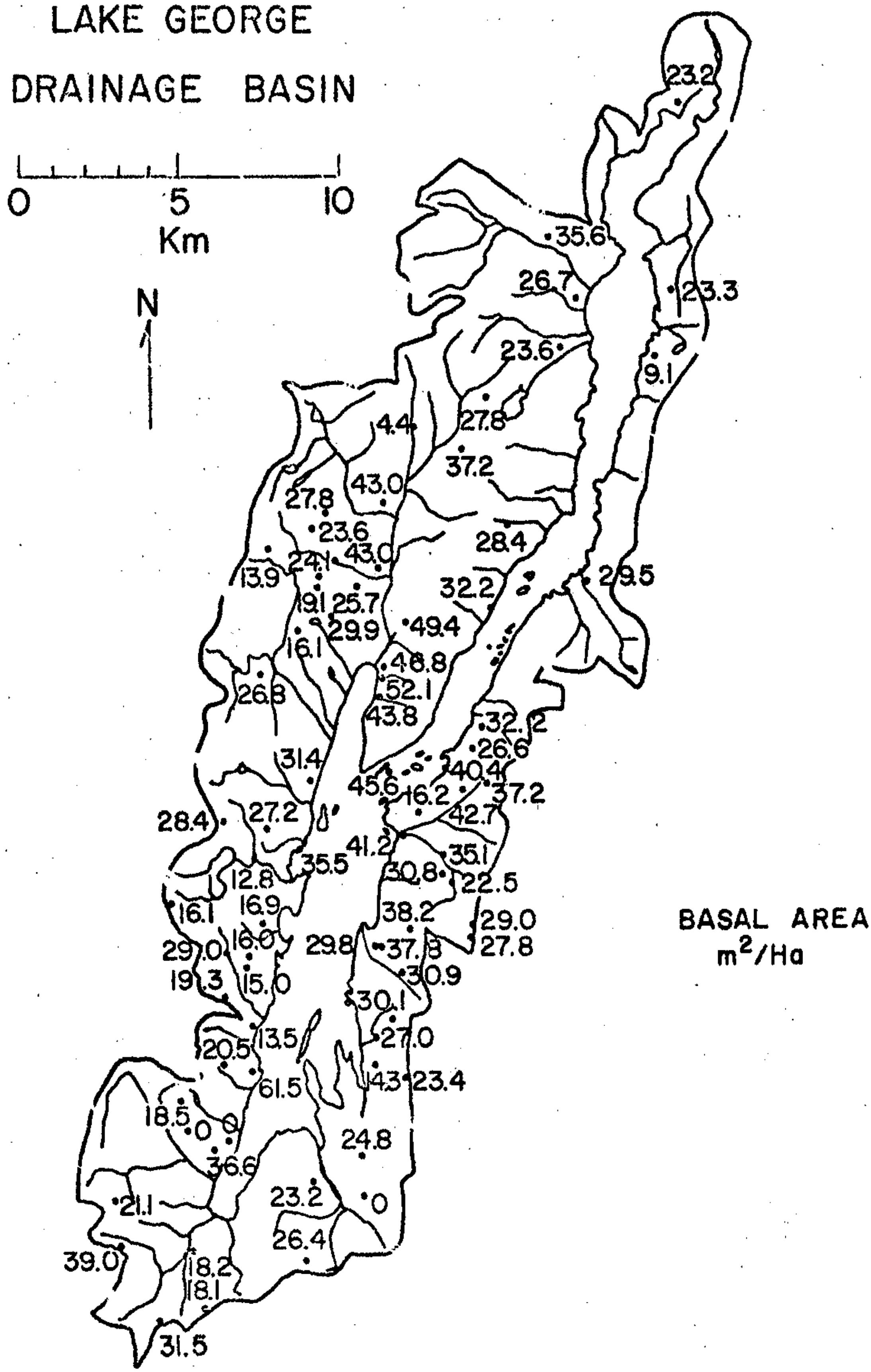
LAKE GEORGE

DRAINAGE BASIN



IMPORTANCE VALUES
FOR BIRCH AND ASPEN


LAKE GEORGE
DRAINAGE BASIN
0 5 10
Km
N
DENSITY (STEMS / Ha)
CANOPY STRATUM
480
538
670
790
363
810
300
125
470
570
917
440
780
510
730
570
350
570
550
450
1160
1700
630
1020
990
690
870
570
540
620
1280
860
640
538
840
890
590
530
700
590
550
330
560
550
1040
350
770
360
740
388
490
490
440
840
420
660
90
590
430
380
550
680
417
0
820
0
570
600
510
0
660
850
433
630
420


LAKE GEORGE
DRAINAGE BASIN
0 5 10
Km
N
BASAL AREA
m²/Ha
23.2
35.6
26.7
23.3
23.6
9.1
4.4
27.8
37.2
43.0
27.8
23.6
28.4
24.1
43.0
13.9
29.5
32.2
19.1
25.7
29.9
49.4
16.1
48.8
52.1
26.8
43.8
32.2
26.6
31.4
40.4
45.6
16.2
37.2
28.4
27.2
42.7
41.2
35.1
35.5
30.8
22.5
12.8
16.1
16.9
38.2
29.0
29.0
16.0
29.8
37.8
27.8
19.3
15.0
30.9
30.1
20.5
13.5
27.0
61.5
14.3
23.4
18.5
0
0
24.8
36.6
21.1
23.2
0
26.4
39.0
18.2
18.1
31.5