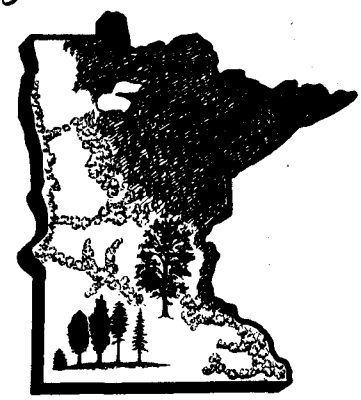

MINNESOTA FORESTRY NOTES

No. 118

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ECOGRAPHS OF HERB SPECIES OF MINNESOTA FOREST COMMUNITIES[1/]

Egolfs V. Bakuzis and Henry L. Hansen[2/]

This report concludes a series of Minnesota Forestry Notes dealing with the data from a 1957 reconnaissance study of 356 Minnesota forest communities. An attempt was made to introduce the method of synecological coordinates into the analysis of forest ecosystems. In general, the idea is related to the contemporary trend of development of models for investigation of complex biological systems and for concentration of information.[3/]

The method of synecological coordinates uses the intensity of biotically effective essential environmental factors on coordinate axes to present characteristics and relationships of the different constituents of ecosystems. It employs a relative scale, from 1 to 5, to characterize the intensity of moisture, nutrients, heat, and light factors at which a species prevails in competition with other species. A single value of each factor is assigned for individual species. Community values are computed as averages of the coordinate values of all species present. An ecograph is the distribution pattern of a species within two or more synecological coordinate axes. It shows the location of the community values in which the species is contained.

The Figure presents 66 ecographs of herb species in moisture-nutrient and heat-light coordinates with frequency lines drawn at 0, 40, and 70 percent levels and superimposed over the total site complexes (synecological fields) of Minnesota forest communities.

The ecographs indicate that there are no totally ubiquitous species, and differences exist even between such widely occurring species as Aralia nudicaulis L., Aster macrophyllus L., Clintonia borealis (Ait.) Raf. and Maianthemum canadense Desf. which are hard to detect by other means. These ecographs assist in finding indicator or characteristic species and their efficient combinations. By superimposing the ecographs of all forest species the whole vegetation continuum or the primary successional scheme of Minnesota forest communities can be reconstructed.

1/ This project was supported in part by Graduate School Research Grant Funds.

2/ Assistant Professor and Professor, respectively, School of Forestry, University of Minnesota.

3/ Bakuzis, E. V. and R. M. Brown. 1962. Elements of model construction and the use of triangular models in forestry research. Forest Science 8 (2): 119-131.

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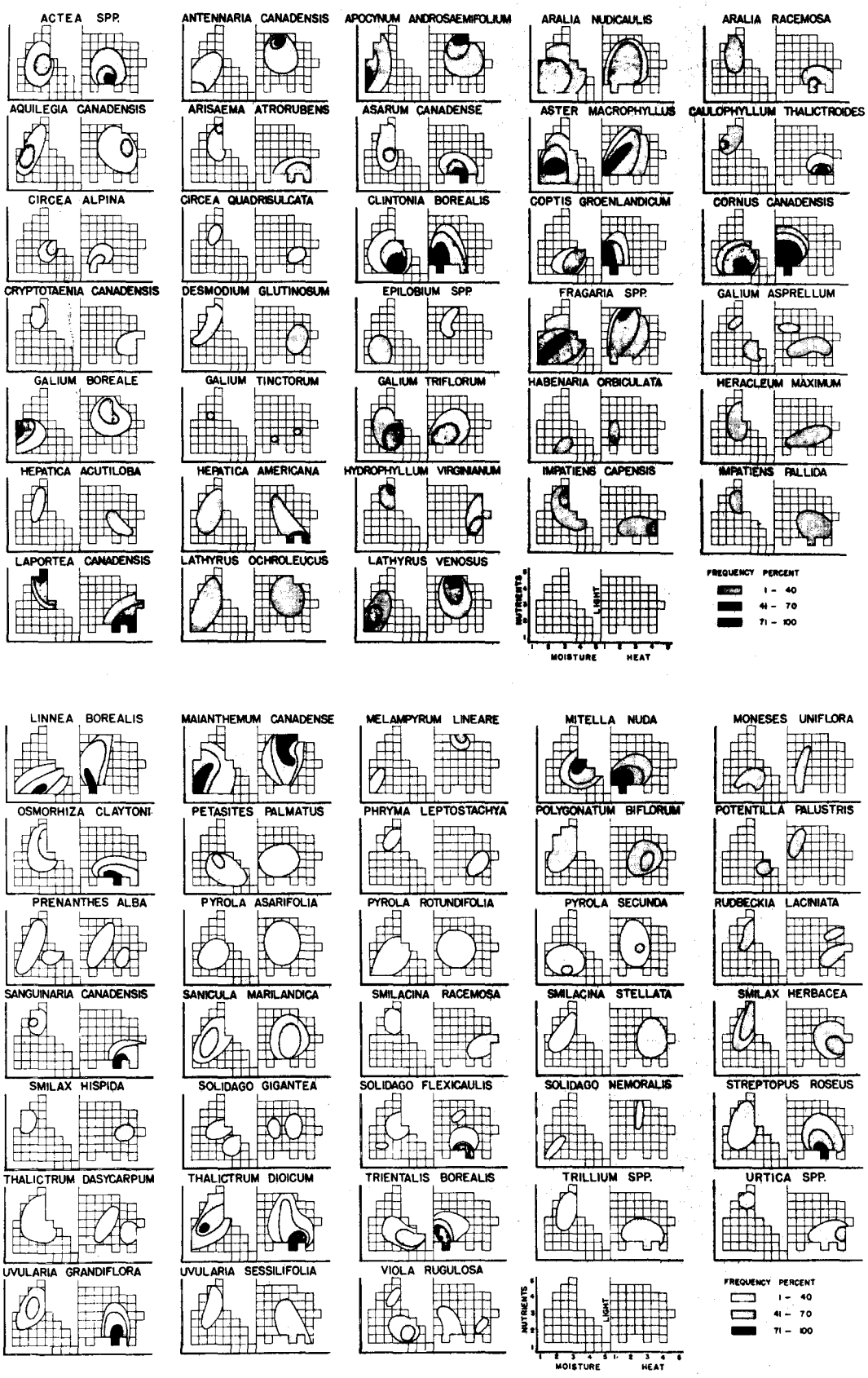

Figure. Percentages of the numbers of forest communities containing a certain herbaceous species as related to the numbers of all communities within unit combinations of moisture-nutrient and heat-light coordinate systems.

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