AN ANALYSIS OF AN ELM-ASH FLOODPLAIN COMMUNITY NEAR NORMAN, OKLAHOMA

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The elm-ash floodplain community is widely distributed throughout the deciduous-forest formation and occurs in nearly all the larger stream valleys of Oklahoma. The sample studied is located on the Oliver Tract (some two miles south of Norman) recently donated to the University. The stand is in a poorly drained area on the fourth (and highest) level of the South Canadian River floodplain. That the habitat is very moist is obvious from the paucity of herbaceous species except the aquatic water-willow weed, *Dianthera americana*, and the presence of liverwort-moss collars at the bases of many of the trees.

A reconnaissance of the area suggested that *Ulmus americana* and *Fraxinus lanceolata* were the dominant trees and this was later confirmed by the quantitative study. Other species listed in order of decreasing apparent importance comprise: *Diospyros virginiana, Celtis laevigata, Populus deltoides, Quercus macrocarpa,* and *Carya illinoiensis*.. Several other species not included in the above list occur on the gradual rise fronting the scarp on the north. A very few large cottonwoods and willows suggest that a cottonwood-willow forest was the immediate predecessor of the elm-ash community on this site.

In the quantitative study a quadrat only 13.2 feet to a side (area, 4 mil-acres) was utilized. Although this quadrat is much smaller than ordinarily utilized in forest research, it was felt that more-accurate data on cover could be obtained by its use. In practice, each of four groups of students analyzed 13 quadrats spaced at intervals of ten paces along predetermined lines. In each quadrat, the following data on each woody species was secured: Number of individuals, crown cover, and basal area.

TABLE I

Frequency, density, crown cover, and basal area of the components of elm-ash association near Norman, Oklahoma

Species	Frequency		Number		Cover	Basal area
	16 sq. m.	80 sq. m.	50	acre	percent	sq. ft.
Fraxinus lanceolata (green ash)	36	90	30	150	30	70
Ulmus americana (American elm)	24	60	14	70	27	49
Diospyros virginiana (persimmon)	18	60	17	85	10	25
Celtis laevigata (sugarberry)	4	20	2	10	3	4
Populus deltoides (cottonwood)	4	20	2	10	5	71
Totals	--	--	65	338	75	219

The results from the study of 50 quadrats are presented in Table I. The two dominants (green ash and American elm) were encountered in the first quadrat and all species (in the quadrat study) were encountered by the time the thirteenth quadrat had been taken. This means that the species-area curve reached horizontality at this point. Certain authors have felt that this break in the species-area curve indicates the sufficient number of quadrats for community analysis. The writer feels, however, that at least fifty quadrats of the size utilized are necessary if one is to gain a proper quantitative concept of the community. Stated in another manner, another group, using the same methods, would need to study 50 quadrats to obtain data comparable to ours.

The frequency percentages of the component species are very close to the actual numbers of individuals found in the quadrats (Table I). When

the size of the quadrat is multiplied by five, however, and the frequencies are recalculated, the frequency percentages are entirely too high for the more sparsely represented species. This means that the larger quadrat (although only 29.5 feet to a side) is entirely too large for community analysis if frequency is to be studied. It is our feeling that the quadrat utilized was approximately the correct size for the elm-ash stand investigated.

SUMMARY

1. A quantitative analysis is presented of an elm-ash forest on the fourth level of the floodplain of the South Canadian River south of Norman, Oklahoma.

2. The site is relatively wet, has little herbaceous cover, and was formerly occupied by a cottonwood-willow forest.

3. Our quantitative work indicates that the quadrat utilized (13.2 feet to a side) was of the proper size to delineate frequency, number, cover, and basal area.

4. The writer believes that at least fifty quadrats of the size employed were necessary for the analysis of the community in question.