Vegetational Changes in a Black Willow Forest Over a Four-Year Period

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At the University of Oklahoma Biological Station on Lake Texoma a black willow forest was sampled by the plant ecology class in the summer of 1960.

In 1960 the forest floor consisted almost entirely of herbs, with a notable zonation from the lake landward. "*Hydrocotyle verticillata*[2] was the dominant species in the very wet and often inundated soil near the lake shore. Near the middle portion of the stand *Diodia virginiana* was the predominant species but was replaced by *Eupatorium serotinum* on the driest portion of the stand" (Penfound, 1961).

During the four-year interval the relative cover of the above herbaceous species was reduced as follows: *Hydrocotyle verticillata,* 29.4 to nothing; *Diodia virginiana,* 25.3 to less than 1; and *Eupatorium serotinum,* 10.4 to less than 1.

On the other hand woody species increased amazingly in areal cover. The relative cover values of the major woody species were as follows: *Rubus* spp., 62.9; *Rhus radicans,* 9.5; *Ampelopsis arborea,* 8.5; and *Cephalanthus occidentalis,* 8.3. The above species accounted for 89.4 percent of the aerial cover of the vegetation on the forest floor.

The light intensity at a height of 4.5 feet did not change significantly in the four-year period (695 vs 640 foot candles). The soil moisture, however, must have decreased considerably during the interval. In 1960 the lower third of the forest was flooded by lake water throughout the growing season. In the remainder of the forest, the water table must have been close to the soil surface. During 1963 and 1964, however, the maximum lake levels were several feet vertically below the lower edge of the willow forest, with the water table being many feet below the soil surface of the forest. It seems probable, therefore, that the replacement of the relatively hydric herbs by mesic shrubs in the period between 1960 and 1964 was due to the gradual desiccation of the habitat.

Literature Cited

Penfound, Wm. T. 1961. The composition of a black willow forest in south central Oklahoma. Proc. Oklahoma Acad. Sci. 41:30-31.

[1]Under the auspices of the Oklahoma Biological Survey, Dr. Carl D. Riggs, Director, and with the help of the following: W. R. Duffer, Mike Horn, M. C. Jennison, D. M. Jones, and Phil Kurata.

[2]Nomenclature according to Waterfall, Keys to the Flora of Oklahoma, 1960.