



RESEARCH NOTES

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BLACK WILLOW DOMINATES BALDCYPRESS-TUPELO SWAMP EIGHT YEARS AFTER CLEAR CUTTING

Our knowledge of successional relations in tidewater river swamps is scant. In an effort to increase our knowledge, the vegetation in a virgin stand of baldcypress (*Taxodium distichum*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), and water tupelo (*N. aquatica*) was compared with the new growth in an adjacent 8-year-old clear-cut area in the Chowan River swamp in Hertford County, North Carolina. The soil, a dark brown muck, was 6 to over 10 feet deep, and numerous buried trees made it difficult to measure depth to the sandy clay loam subsoil. Estimates of the organic matter, using the loss by ignition method in four composite samples, ranged from 81.0 to 87.2 percent.

Sampling points in the two areas were located at 1-chain intervals on 15 lines running perpendicular to the swamp-upland border. At each point trees over 15 feet tall were sampled with a prism and the number of trees by species recorded as an estimate of basal area. Shrub and herb layers less than 15 feet tall were sampled in a 5- by 20-link milacre quadrat; the percent crown cover of the plot area by species was recorded. Cover type in the uncut swamp was determined from prism counts; in the clear-cut area, data from both prism counts and the milacre counts were used.

The uncut stand includes a dense overstory of tall, uneven-aged baldcypress and tupelos, with scattered understory trees of the same species and red maple (*Acer rubrum*) and Carolina ash (*Fraxinus caroliniana*). Shrubs and most herbs are restricted to raised surfaces, such as logs, cypress knees, and the hummocks around stumps and the tree boles themselves, for the soil is usually flooded throughout the fall, winter, and spring.

Eight growing seasons after the fall and winter high-lead logging operation, most of the clear-cut area is dominated by black willow (*Salix nigra*) 15 to 25 feet tall and up to 5 inches in diameter. On the 10-chain wide clear-cut strip the over-all stocking of the desirable baldcypress and tupelos was unsatisfactory (table 1).

Within the matrix formed by the black willow stand, smaller communities of different dominant vegetation occur. On limited wet areas cattails are the principal cover type. Occasional clumps of young baldcypress, swamp tupelo, and water tupelo occur where residual seed sources or advanced reproduction were not destroyed by the high-lead skidding operation. The species of shrubs and herbs in the cut and uncut areas are similar, but they attain greater abundance where the forest was clear cut.

Table 1. --Frequency of occurrence of certain tree species 8 years after clear cutting

Species or species group	Origin	Cover type		
		Black willow (32 plots)	Cattail (7 plots)	Baldcypress-tupelo (8 plots)
- - - <u>Frequency as percentage of plots</u> - - -				
Black willow	Seed	100	57	33
Red maple	Seed	12	29	50
	Seed and sprout	12	29	62
Swamp tupelo	Seed	16	14	25
	Seed and sprout	34	14	38
Water tupelo	Seed	3	43	62
	Seed and sprout	3	57	62
Baldcypress	Seed	16	29	88
Baldcypress and tupelo	Seed	24	71	100
	Seed and sprout	53	71	100

Except in the scattered cattail areas and clumps of tupelo and baldcypress reproduction, black willow is the only tree of seed origin to form the dominant canopy. Vigorous tupelo sprouts are scattered throughout the area but their future value is uncertain because they originated high up on large stumps.

At present the black willows are very vigorous and there is no indication of stagnation. However, the overstory shade of black willow has produced little indication of suppression in the seedlings of other desirable species. How long the dominant stand will persist remains to be seen.

Although stands of black willow normally occur on recently exposed alluvial soils, in this instance a stand became established on a deep organic soil. Apparently the large amount of slash, stumps, logs, and hummocks offered sufficient seedbed for black willow to become quickly established as the high water receded in the spring. Since black willow produces abundant seed crops nearly every May or June, dense stands may result after winter clear cutting.

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