

## Impact of supplemental planting of early successional tree species in bottomland hardwood reforestation sites

### Description:

Reforestation of bottomland sites on public lands, and on private lands through forest easements under the U.S. Department of Agriculture's Wetland Reserve Program and the U. S. Fish and Wildlife Service's Partners for Wildlife Program, have historically emphasized sowing acorns or planting seedlings of heavy-seeded oaks and pecan. These heavy-seeded species are often slow to develop vertical forest structure. Additionally, where distances to source populations of light-seeded tree species are great, lack of invasive early-successional tree species further limits rapid development of vertical forest structure. We will supplement heavy-seeded tree plantings with small patches of early-successional species within reforested sites to promote vertical structure, provide avian perches and nest sites, and thereby increase richness of woody species. Because fast-growing species may be more impacted by weedy herbaceous vegetation than are slow-growing trees species, we will assess different weed control measures. We predict that this ultimately will increase richness of avian species.

### Progress to Date:

During March 1998, we provided supplemental plantings on 22 reforestation sites within the Mississippi Alluvial Valley: 5 sites in Arkansas, 10 sites in Louisiana, 3 sites in Mississippi, and 4 sites in Tennessee. On each site, 8 patches with 12 trees per patch were planted. Four patches were cottonwood (*Populus deltoides*) and 4 patches were sycamore (*Platanus occidentalis*). Within a species, 1 patch was untreated, 1 was treated with a chemical weed barrier, 1 was treated with physical weed barriers, and 1 was treated with both physical and chemical weed barriers. Overall, survival and growth of sycamores exceeded that of cottonwoods. Drought conditions that prevailed during the summer of 1998 probably contributed to higher mortality of cottonwood. Because of drought, 2 site planted in

1998 were total or near total failures and were replanted. Where trees survived, tree heights varied but often exceeded 1 meter. However, on several sites (particularly in Arkansas) chemical application appeared to have stunted development or killed sycamores. Dead trees (all or some) were replaced on all but 2 study sites. A total of 40 study sites currently have supplementally planted cottonwood and sycamore trees. During fall 2000, sites were evaluated for 1st and 2nd year survival. First-year survival of cottonwood and sycamore was 25% and 47%, respectively. Second-year survival of extant trees was 52% for cottonwood and 77% for sycamore. Physical weed barriers increased survival of cottonwoods to 30% versus 18% survival with no weed control. Similarly, sycamore survival was increased from 49% without weed control to 64% with physical weed barriers. Chemical weed control adversely impacted sycamore and reduced survival to 35%.

### Management Implications:

Use of supplemental planted trees can dramatically alter the vertical profile of vegetation on reforested lands. However, to be effective these plantings must be protected from damage caused by deer. An alternative may be to increase the number of supplemental planted trees to compensate for damage to trees. Weed control is critical to survival of cottonwood on reforested sites.

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