

**PLANTED OAKS AND NATURAL INVASION IN BOTTOMLAND HARDWOOD FORESTS OF
THE LOWER MISSISSIPPI ALLUVIAL VALLEY**

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Conversion of woodlands to other land-use types has resulted in the loss of over 80 percent of the historic bottomland hardwood forests of the Lower Mississippi Valley. This represents a loss of more than 6 million ha of forested wetlands. Heightened interests in reforestation and the mixed results associated with past afforestation efforts emphasize the need for more and better information on successful tree planting and the effects of natural woody invasion.

We studied the survival and growth of 9- to 12-year-old planted oak seedlings and natural invasion by other woody species in 459 plots on 18 fields in Arkansas, Louisiana, and Mississippi. To assess the natural woody invasion, 200 m² plots were established at 50 m intervals from forested edges. We encountered six species of planted oaks, more than 19 species of potential overstory invaders, and 13 small tree or shrub species. Survival of both planted oaks and natural woody invaders was uneven among locations. We found as few as 25 and as many as 898 oaks and between 170 and 11,095 natural invaders per hectare.

Natural woody invaders outnumbered planted oaks at all but two locations and were most abundant when the plots were within 450 m of a forest edge. The majority of light seeded invaders were found within 200 m of the forest edge. Green ash (*Fraxinus pennsylvanica* Marsh.), Pumpkin ash (*F. profunda* (Bush) Bush), sweetgum (*Liquidambar styraciflua* L.), American elm (*Ulmus americana* L.), and cedar elm (*U. crassifolia* Nutt.) made up 49 percent of all invaders and were found on greater than 50 percent of all plots. We found multiple factors affected seedling survival included soils, topographic position, rainfall, and herbivory.