

## Public Abstract

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Graduation Term: Fall

Graduation Year: 2006

Title: RESPONSE OF NATURAL AND ARTIFICIAL PIN OAK REPRODUCTION TO MID- AND UNDERSTORY REMOVAL IN A BOTTOMLAND HARDWOOD FOREST

This project was initiated to examine methods that might be used to achieve adequate numbers of pin oak seedlings in the understory of bottomland forests. The research was done in southeastern Missouri on sites where pin oak is a dominant overstory species, but it is relatively rare in the mid- and understory. The objective of the project was to investigate the influence of light on the growth and establishment of pin oak seedlings.

To increase the amount of light reaching the forest floor, non-oak mid- and understory trees were removed. Additionally, ground level vegetation was controlled with herbicide in various locations throughout the study area. Acorns, 1-year-old nursery-grown seedlings, and larger containerized seedlings were also planted in the study area. Survival and growth of these seedlings were compared to that of natural seedlings that were already present in the understory.

The mid- and understory removal treatments were able to successfully increase the amount of light reaching the forest floor. This was of great benefits to the oak seedlings. The increase in light led to the establishment of numerous new pin oak seedlings compared to areas where there was no mid- and understory removal.

After three years, the survival of nursery-grown seedlings and larger containerized seedlings was much greater than that of natural seedlings and seedlings resulting from planted acorns. Although seedlings resulting from planted acorns did have much greater diameter and height growth over the three years than any of the other planting types, nursery-grown and containerized seedlings were still much larger than planted acorn seedlings and natural seedlings. The treatment of ground level vegetation reduced the survival and growth of all planting types, suggesting that this technique may not be able to benefit pin oak seedling growth as much as was expected.

Overall, the increase in light brought about by the removal of some mid- and understory trees was not only beneficial to the pin oak seedlings already present, but also succeeded in allowing new pin oak seedlings to grow and become established. These results hold a great deal of promise for the future use of mid- and understory removal in these kinds of settings.