

# The Interacting Roles of Hydrology and Light in Structuring Regeneration of East Texas Bottomland Hardwood Forests

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## Introduction

Bottomland hardwood (BLH) forests develop on floodplains in the Southeastern United States, where they experience annual, long-term inundation by their associated rivers. This flooding moves sediment and seeds, significantly reduces oxygen availability to seedlings, and can help to topple mature trees. BLH forests represent high quality habitat for a variety of wildlife species and are important for water quality and for the production of high-value wood products. However, over 60% of BLH forests in East Texas have been



lost, and widespread modification of streams by dams and levees is suspected of causing a shift in tree composition from flood-tolerant to flood-intolerant species in the forests which remain. Furthermore, invasion by exotic plants such as Chinese tallowtree suppress forest regeneration and impact habitat quality for wildlife. Conservation and restoration of these forests is a high priority in light of these challenges, and will require detailed knowledge of the conditions which newly-emerged seedlings need in order to survive and mature. In this study, I will investigate the

effects of differences in flood regime and ground level light, as well as interactions between the two, on the species composition of regeneration in BLH forests. Data gathered will inform future restoration and conservation efforts.

## Methods

Surveys will be carried out in three rivers' floodplains – the Neches River, The Angelina River, and the Attoyac Bayou. These rivers drain watersheds of very different sizes – 6276 km<sup>2</sup> (2423 mi<sup>2</sup>), 4143 km<sup>2</sup> (1600 mi<sup>2</sup>), and 1476 km<sup>2</sup> (570 mi<sup>2</sup>), respectively, and vary in terms of how water levels respond to precipitation. Sites on the Attoyac Bayou floodplain are sometimes flooded by Sam Rayburn Reservoir, in addition to water from the Bayou itself. In order to introduce variation in both flooding regime and light, a series of separate survey areas will be arranged around 10-12 treefall gaps on each floodplain, with some survey areas in full sun in the middle of the treefall gap, some under tree canopies immediately north of the gap where sunlight comes in horizontally from the south during mid-day, and some under tree canopies immediately south of the gap where very little direct sunlight reaches the forest floor. Surveys will be carried out during the 2022 growing season.



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