

Control of Chinese Tallow Tree (*Triadica sebifera*) in Patch Clearcuts with Forest Herbicides



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Introduction

Chinese tallow tree's ability to reproduce early in its life span, root and stump sprout prolifically, and produce large seed crops give it a competitive edge over native species and makes it an aggressive invasive species. Bottomlands are particularly susceptible to invasion by this highly adaptable species. Its sprouting ability necessitates control by herbicide application as opposed to control by mechanical means or fire. Garlon® (Triclopyr) and Arsenal® (Imazapyr) were applied by hack and squirt, cut stump and foliar application to recently created patch clearcuts at the Pineywoods Mitigation Bank (PMB) in East Texas, south of Diboll. Pre- and post-application assessments were made of: 1) tallow and other tree biomass; and 2) grass, forb, and slash percent cover to determine herbicide efficacy and to test the null hypothesis that herbicide is not effective where tallow is dense and grass competition is low.



Image 1: Chinese tallow tree in a 1 m² plot at the PMB July 2012.



Image 2: Grasses, forbs, and slash in a 1 m² plot at the PMB July 2012.

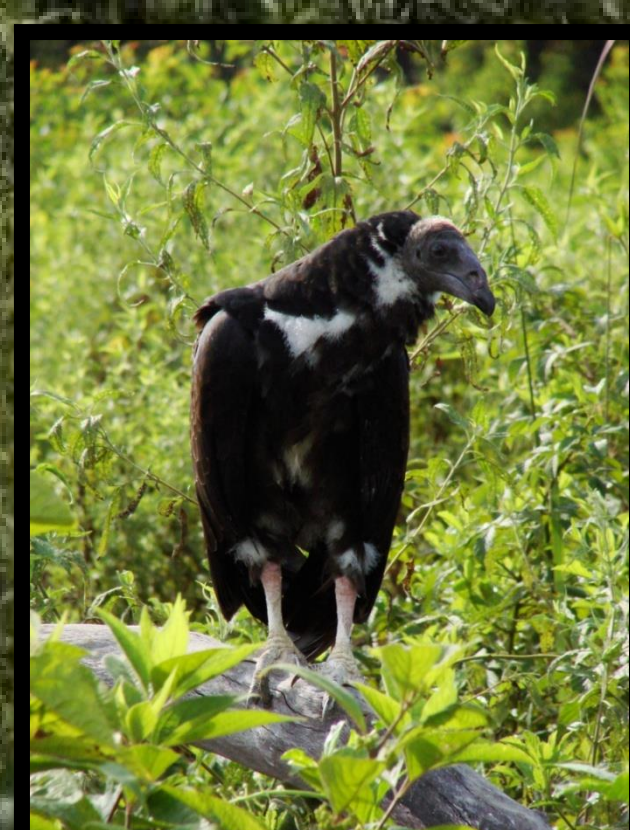


Image 3: A juvenile black vulture in a patch with sparse Chinese tallow tree at the PMB July 2012.

Results

Post-herbicide assessments in January showed nearly complete tallow control with no obvious recruitment of seedlings or sprouts into the plots or across the patches. No other tree or grass species were adversely affected by treatment. Neither grass competition, whether heavy or light, nor tallow density, were deterrents to treatment efficacy. All herbicide treatments appeared equally effective at this early stage. However, further monitoring of the sampling areas will be needed to observe sprouting or seeding-in of new tallow trees. Results will guide recommendations on areas that may require more effort to effectively control tallow invasions.

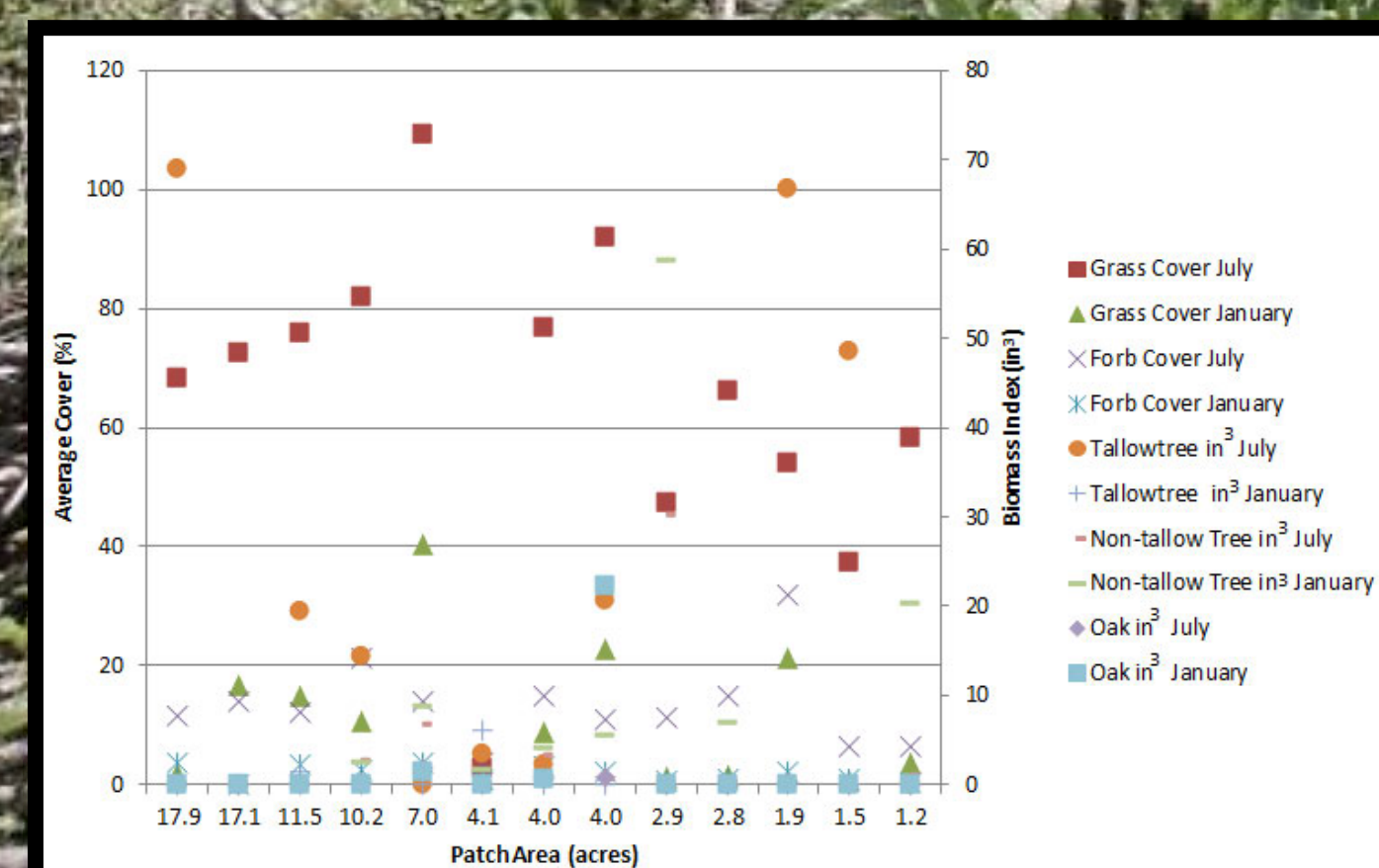


Figure 1: Cover and biomass index by patch acreage for trees, grasses, and forbs in July 2012, and January 2013, at the PMB.

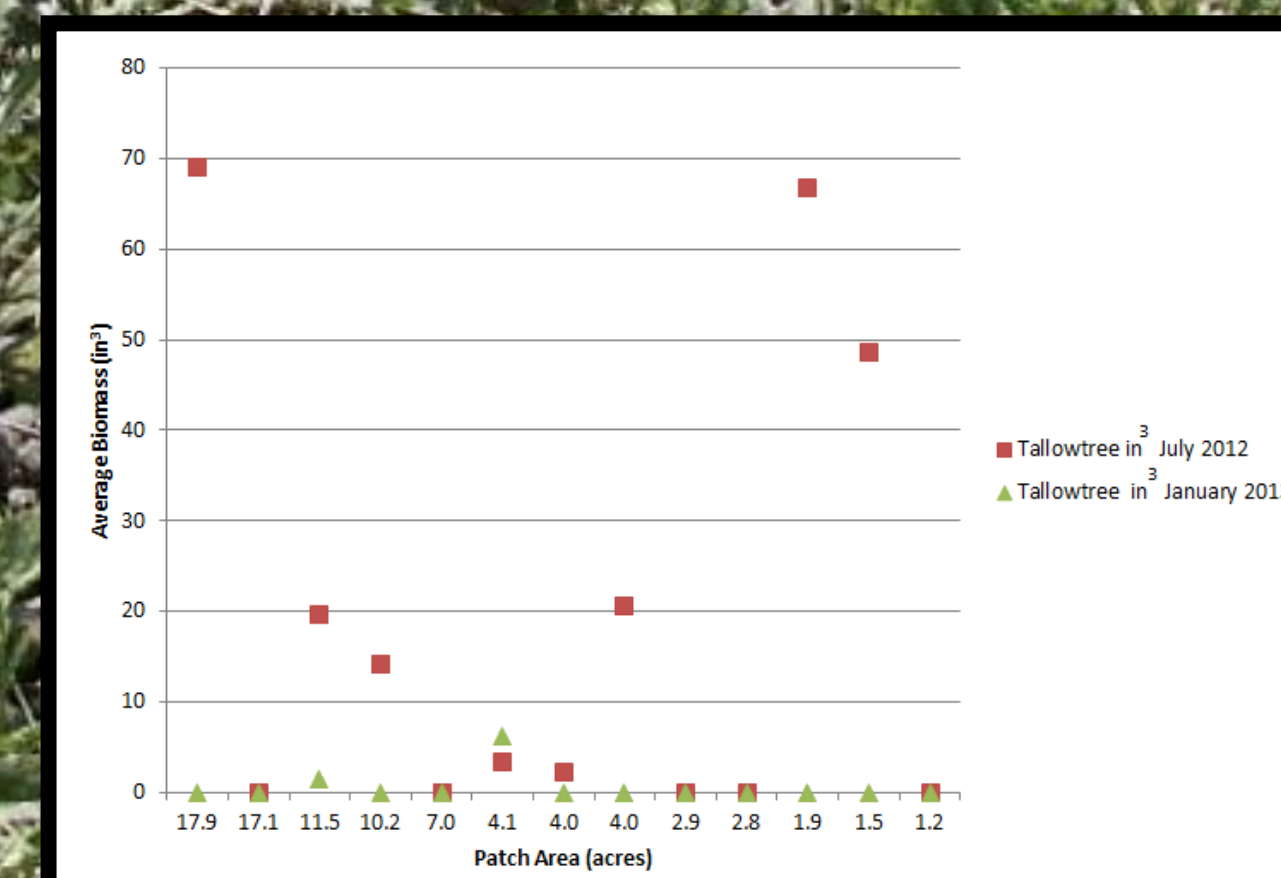


Figure 2: Chinese tallow tree biomass index pre-treatment in July 2012, and post-treatment in January 2013, at the PMB.



Image 7: Dead Chinese tallow trees post-treatment, January 2013, at the PMB.



Image 8: Plot with little grass competition at the PMB July 2012.



Image 9: Mixed grasses and Chinese tallow trees at the PMB July 2012.



Image 10: Grass dominated patch clearcut at the PMB January 2013.

Methods

Shape files of 13 patch clearcuts within the Pineywoods Mitigation Bank were input into ArcGIS 10 to determine the total area of each patch cut. Sampling intensity (1.5 plots per acre) was chosen based on total clearcut acreage and available resources. Plot locations were set using ArcMap and random numbers generated by Microsoft Excel. Plots were located in the field within each patch clearcut using a Trimble Juno SB. Each sample plot was marked with a square of PVC pipes 1 m on each side, and all vegetation within was surveyed. Height (H) and basal diameter (D) were measured for each tree species, and used to calculate a biomass index (D^2H). Percent cover was ocularly estimated, and maximum and average height were measured for grasses and forbs. Slash percent cover was also estimated. Plots were first assessed pretreatment in July 2012, and were remeasured post treatment in January 2013.



Image 4: Setting up a plot at the PMB July 2012.



Image 5: Surveying woody vegetation at the PMB July 2012.

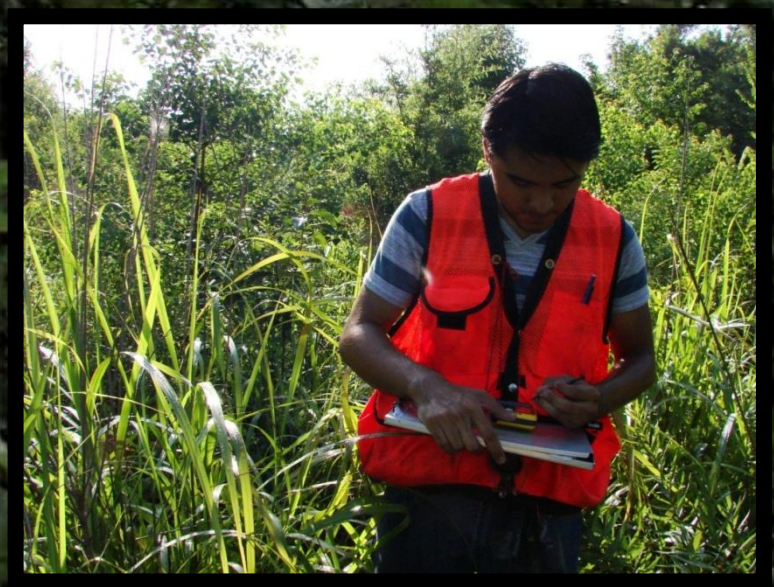


Image 6: Recording data at the PMB July 2012.

Conclusion

Tallow within the clearcuts was irregularly distributed and interspersed with native tree species, grasses and forbs. Tallow distribution was patchy in some clearcuts and almost completely absent in others. Grass in some areas exceeded five feet in height while others were less than five inches. Forb heights and slash distribution were variable across and within all thirteen patches. There were no signs of competitive exclusion by the grasses, forbs, or native species by visual observation or based on examination of the data. Future assessments may require more intense sampling to adequately quantify the degree of observed variability. Further monitoring of these plots will be necessary to evaluate potential re-sprouting.



Image 11: Grasses and slash in a patch clearcut at the PMB July 2012.



Image 12: Tallow, tall and short grasses, forbs, and slash in a patch clearcut at the PMB July 2012.



Image 13: A plot with dense slash at the PMB July 2012.

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