

FIRE EFFECTS ON THE STRUCTURE OF WOODY VEGETATION OF *CERRADO DENSO*, A SAVANNA-LIKE VEGETATION OF CENTRAL BRAZIL

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ABSTRACT

The cerrado, a savanna-like vegetation, covers 25% of the Brazilian territory. *Cerrado denso* is the denser form of cerrado, with trees reaching 8 m in height and an herbaceous layer composed of sparse herbs and grasses that dry out from April to September, when fires are common in the region. In 1992, at the Instituto Brasileiro de Geografia e Estatística Ecological Reserve, 26 km south of Brasília, Brazil, three 10-ha plots, protected from fire for 18 y, were selected to investigate the effects of fire on the mortality rate of the *cerrado denso* woody vegetation. The fire regime selected was biennial fires at the beginning (Jun), middle (Aug), and end of the dry season (Sep). Before the fires, there were 2,040 (Jun), 2,188 (Aug), and 1,870 (Sep) live individuals/ha in the plots, distributed among 59, 62, and 68 species. The estimated aboveground tree biomass was 20.7 t/ha (Jun), 35.3 t/ha (Aug), and 38.7 t/ha (Sep). In the herbaceous layer, the biomass was 7.5 t/ha in the June and August plots and 5.4 t/ha in the September plot. In 2001, after five biennial prescribed fires, the cumulative mortality was 32% in the June plot, 34% in the August plot, and 41% in the September plot. These numbers increased to 48% (Jun), 54% (Aug), and 74% (Sep) when the numbers of stems destroyed (dead + topkill) are considered. The fires resulted in a loss of approximately 26% of the woody aboveground biomass in the June plot, approximately 40% in the August plot, and approximately 45% in the September plot. There was an increase of 1.8 t/ha in the biomass of the herbaceous layer in the June plot, 1.0 t/ha in the August plot, and 4.9 t/ha in the September plot. The results suggest that the structure of the woody vegetation in the *cerrado denso* is highly affected by high fire frequency. The reduction in the number of live stems and the increase in the herbaceous layer biomass may result in changes in the energy balance of the system, with significant alterations in the carbon and water fluxes.

Citation: Sato, M.N., H.S. Miranda, and P.J. Riggan. 2007. Fire effects on the structure of woody vegetation of *cerrado denso*, a savanna-like vegetation of central Brazil. Page 226 in R.E. Masters and K.E.M. Galley (eds.). Proceedings of the 23rd Tall Timbers Fire Ecology Conference: Fire in Grassland and Shrubland Ecosystems. Tall Timbers Research Station, Tallahassee, Florida, USA.