

# A Study of Bushfires in a Ghanaian Coastal Wetland. II. Impact on Floral Diversity and Soil Seed Bank

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## Abstract

The study was undertaken at the Muni-Pomadze wetlands near Winneba in the Central Region of Ghana. The main objective was to investigate the impact of bushfires on the vegetation and soil seed bank of the wetland, which ultimately affects its biodiversity. The methodology involved a floristic and seed bank study to determine the effect of bushfires on the flora and seeds in the study area. The results indicated a significant effect of bushfires on the diversity and abundance of floral species, plant life-forms and the soil seed bank. There was a general degradation of the wetland as a result of rampant bushfires. It is recommended that re-afforestation, as well as public education and awareness programmes be initiated in the area. It is also recommended that local participation in biodiversity conservation initiatives should be enhanced.

## Introduction

The Muni-Pomadze wetlands in the Central Region of Ghana, an internationally-recognized coastal wetland (Ramsar site), is an important ecotourist area which has suffered from neglect and rampant bushfires over the years, a situation which poses serious threats to its biodiversity. The use of bushfires as a major tool for clearing agricultural land (e.g. shifting cultivation) in most African societies, including Ghana (Hall & Swaine, 1981; Korem, 1985), has resulted in intense burning and grazing of grasslands leading to habitat fragmentation and changes in vegetation height and density. Over the long term, bushfires pose very serious threat to biodiversity conservation in Ghana (Swaine *et al.*, 1997; Gboloo, 1998).

Seed dispersal and subsequent germination are crucial phases in plant regeneration (Harper *et al.*, 1965), as seeds deposited in topsoil by dispersal become the seed bank after transportation through the soil profile by physical processes or soil

organisms. The deeper the seed bank, therefore, the longer the seeds had been deposited on the top soil. Seed banks allow seeds to be carried over from year to year, with many plant communities having large natural soil seed banks of herbaceous and weedy species (Thompson, 1978).

Knowledge of the abundance and composition of the soil seed bank, and, therefore, its regeneration potential, is thus crucial in understanding the process of habitat regeneration. For example, the regeneration of natural wildlife habitat after human disturbance (e.g. bushfires) is principally from *in situ* growth of buried seeds (soil seed bank), underground plant parts, or transport of disseminules ("seed rain") into the area after the disturbance (Moore & Wein, 1977). This has implications for biodiversity conservation, since any change in the regeneration potential of a habitat would result in a change in the faunal composition, and ultimately a reduction or loss of biodiversity.