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**A STUDY OF THE SOIL AND VEGETATION PATTERNS  
WITHIN PART OF THE PILLIGA FORESTS, AND AN EVALUATION OF THE  
IMPACT OF EUROPEAN SETTLEMENT ON THE VEGETATION.**

by

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A thesis submitted as partial fulfilment of the requirements  
for the degree of MSc in the School of Earth Sciences,  
Macquarie University.

July 1996



# MACQUARIE UNIVERSITY

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## ABSTRACT

An investigation of the relationships between soil and vegetation was undertaken within part the Pilliga State Forests in north-western New South Wales in order to develop a model explaining the contrasting vegetation patterns observed.

Given the uniformity of climate in the Pilliga forests it was suggested that vegetation structure and floristics would be largely influenced by the nature of the substrate and local topographic and drainage conditions. The most common soil within the study area is a texture-contrast soil, the formation of which is discussed. Two other soils are described in the study area and their geomorphic and pedologic origins postulated.

A soil moisture - slope model was proposed as a major influence in the distribution of species and communities along a topographic gradient from a ridge crest to depression. Seven plant communities were described for the study area, and 185 species recorded. A low proportion were exotic (5 taxa), and the possible significance of this was discussed.

European settlement and land management has been alleged to have had an enormous impact on the structure of the forests, altering them from an open savannah woodland to woodlands of much greater tree densities with shrubby understoreys. This research demonstrates that dramatic structural changes in the study area were not of the magnitude as previously claimed, with some communities being present relatively unchanged for well over 100 years.

This work has not been submitted for a higher degree to any other university or institution.

*Ethorn*  
.....

July, 1996

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