



RESEARCH REPORT



# The CSIRO Rainforest Permanent Plots of North Queensland

Site, Structural, Floristic and Edaphic Descriptions

Compiled and Edited by Andrew W. Graham



Rainforest CRC



CSIRO



# THE CSIRO RAINFOREST PERMANENT PLOTS OF NORTH QUEENSLAND

## SITE, STRUCTURAL, FLORISTIC AND EDAPHIC DESCRIPTIONS

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Cover photographs:

(Top) On the access road to Plot 7 (EP29) Mount Fisher.

(Centre) Measuring a Leichhardt Pine (*Nauclea orientalis*) at Plot 18 (EP42) Iron Range.

(Bottom) Tower view east to the coastal range, Plot 3 (EP4) Little Pine Creek.

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## ABSTRACT

Between 1971 and 1980, twenty research plots were established in the rainforests of northeastern Australia to provide long-term ecological and growth data. Plot sites were located opportunistically, with most being unlogged and undisturbed by European activities. Eight plots were variously affected by cyclones after establishment. Radiocarbon dating of soil charcoal indicated that fires occurred on five sites since 2000 BP. In early 2006, prior to the passage of Cyclones Larry and Monica, all plots were accessible with data records spanning periods of 24 to 31 years.

Most plots (seventeen) were located between 145° 04' E to 145° 50' E and 16° 08' S to 18° 30' S in a wide range of annual rainfall settings from 1400 mm to >3000 mm. Twelve plots were located above 700 m altitude. Only five plots were located on soils of high or moderately high fertility.

At plot establishment, all trees with stems  $\geq 10$  cm diameter were positioned, identified and measured for diameter and height. Semi-quantitative data on understorey species composition within subplots were also collected. Plots were remeasured every two years for the first ten years, and then at three or four yearly intervals, with diameter, recruits and deaths recorded. Heights generally were remeasured only in 1998.

To assist with future analyses and interpretation of the plot data, this report presents descriptions of the biophysical settings, disturbance histories, structures, physiognomies and floristic compositions of the plots using information compiled from all available sources and limited new sampling programs. Inconsistencies with previous descriptions are noted where appropriate. Descriptions of landforms and soil profiles are supplemented with quantitative data on soil bulk density, particle size, soil moisture characteristics and chemical analyses, together with methodological details. Illustrations show plot locations, key site features and forest profiles. As detailed analyses will be presented elsewhere, this review gives only a general data summary for stem density (plot range 408 to 1170 stems  $\text{ha}^{-1}$ ) and basal area (plot range 28.6 to 69.8  $\text{m}^2 \text{ha}^{-1}$ ). Plant species richness on the plots varied from 84 to 189.

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