Woodland change

In terms of the area involved, the clearing of woodland has been one of the most significant historical vegetation changes. The wheatbelts in inland south-eastern and south-western Australia are to a large extent within areas formerly occupied by woodland. Much of this woodland has been transformed into an agricultural landscape of pastures and crops, where the only remnants of the former vegetation occur as isolated uncleared patches or narrow strips along road verges.

In total about 500 000 km^2 of natural woodland area (both **M2** and **L2**) are now occupied by other vegetation types, chiefly tussock grassland and sown pasture. This figure represents only about one-third of the total original woodlands, but within much of this area there has been an almost total elimination of the native elements of the vegetation. Most of the dominant species of the canopy survive as individual standing trees, but much of the initial diversity of the understorey and ground cover has been lost because of the dominant force of repeated cultivation, grazing and weeds.

Large parts of the cleared agricultural lands of eastern Australia formerly supported layered woodlands with dense low tree and shrub understoreys. The reduction in biomass and transpiration that results from the clearing of these woodlands (**M2L**) may be as significant as that resulting from forest clearing.

Throughout the cropping and intensive animal production areas, the replacement of the now senile population of standing trees is threatened by insufficient regeneration. This is largely the result of continuous grazing of seedlings by domestic stock, but the additional stresses which cause dieback in adult trees also affect juveniles. In some areas, such as the New England area of northern NSW, the partial removal of timber has been followed by many deaths through dieback among the remaining trees (Old and others 1981).

The low woodlands occur mostly in drier areas and remain largely unaltered, but in the grazing lands of the south-east they have been subject to clearing and thinning. Areas of *Acacia* and *Casuarina* low woodland through inland NSW and Qld have also been thinned or partially cleared in patches to increase livestock carrying capacity.

Open woodland is a widespread vegetation structure, in total (both **M1** and **L1**) covering nearly 2 million km^2. Low open woodland with either hummock or tussock grass understoreys occupies about 80% of this area.

The area of open woodland (**M1**) has doubled in the last 200 years, from about 175 000 km^2 to over 400 000 km^2. This results primarily from the creation of artificial open woodland by the partial clearing of forest and woodland. Selective clearing and ring-barking in these areas have left only the largest trees for shade and shelter. In places this coding describes the average cover of areas where there are remnant patches of denser vegetation within largely cleared lands. Areas such as these appear as 'tree thinning' on the Major Vegetation Changes map.

The area of low open woodland has also increased since European settlement, partly through the invasion of the Afro-Asian prickly acacia (*Acacia nilotica*) over about 50 000 km^2 of former grassland in north-central Qld. It is the most significant historical increase in upper stratum vegetation. The remainder of the increase is the result of thinning in low woodlands.

Remnants of former bushland along a roadway in the SA wheatbelt
The importance of these uncleared islands and corridoors as repositories of the former diversity of the vegetation has now been recognised and in several states many roadside verges are now protected.

Prickly acacia

Acacia nilotica was introduced to the treeless Mitchell grass plains for shelter and fodder and in the last decade has undergone a huge increase from initial infestations around the major towns in the region. It has invaded about 50 000 km^2 of former grassland in north-central Qld, which appears as the green area on the map of major vegetation changes. The spread of prickly acacia is associated with watercourses and stock movements and it now forms a low open woodland with localised areas of low woodland. In the early stages of infestation the younger plants tend to be tall shrubs rather than low trees, as shown in the photo below taken on Olive Downs station near Richmond. There are large concentrations around the towns of Richmond, Hughenden, Muttaburra and Winton and it is spreading into the Longreach area. This Afro-Asian species is ideally suited to an ecological niche unoccupied by any of the native trees or shrubs.