Advice to the Minister for the Environment, Water, Heritage and the Arts from the Threatened Species Scientific Committee (TSSC) on Amendments to the List of Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1. Name

Nominations were received for two ecological communities: Weeping Myall Open Woodland of the Riverina and NSW South-western Slopes Bioregions; and Weeping Myall Open Woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions. The two nominated ecological communities intergrade and exhibit numerous similarities such that the Committee considers them to be sufficiently similar and merit listing as a single ecological entity.

Furthermore, the ecological community also occurs in the Murray-Darling Depression, Cobar Peneplain and Nandewar Bioregions. Therefore, reference to bioregions has been removed to simplify the name of the ecological community.

The species *Acacia pendula* is known as Boree in southern NSW and as Myall in northern NSW and Queensland. However, as it shares these common names with other *Acacia* species, it is considered appropriate to retain the common name 'Weeping Myall' as it applies exclusively to this species.

Finally, as the density of trees in the ecological community varies from site to site, references to the density of the woodland are excluded from the name.

The name of the ecological community is therefore **Weeping Myall Woodlands**.

2. Description

The Weeping Myall Woodlands occur in a range from open woodlands to woodlands, generally 4-12 m high, in which Weeping Myall (*Acacia pendula*) trees are the sole or dominant overstorey species. Other common names for Weeping Myall include Myall, Boree, Balaar, Nilyah, Bastard Gidgee, and Silver Leaf Boree.

Species assemblage

Weeping Myall trees often occur in monotypic stands, however other vegetation may also occur in the ecological community, though not as dominant species. These include: Western Rosewood (*Alectryon oleifolius* subsp. *elongatus*); Poplar Box (*Eucalyptus populnea*); or Black Box (*Eucalyptus largiflorens*) (NSW Scientific Committee 2005; Keith 2004). Grey Mistletoe (*Amyema quandang*) commonly occurs on the branches of Weeping Myall trees throughout the ecological community's range (NSW Scientific Committee 2005). Other species commonly present in the community are listed in Appendix 1.

Weeping Myall goes through regular cycles of senescence (aging and death) and regeneration. Weeping Myall trees are also susceptible to defoliation by Bag-shelter Moth (*Ochrogaster lunifer*) caterpillars and are often lopped for domestic stock fodder. Therefore, the ecological community can be dominated by Weeping Myall trees that are in a living, defoliated or dead state.

The understorey of Weeping Myall Woodlands often includes an open layer of shrubs above an open ground layer of grasses and herbs, though the ecological community can exist naturally either as a shrubby or a grassy woodland (Beadle 1948; Keith 2004). In many areas, however, the shrub layer has disappeared through overgrazing and dieback events and the woodland now has a primarily grassy understorey (Beadle 1948). The ground layer includes a diversity of grasses and forbs, and varies in species composition and cover depending on past

and current grazing regimes, and the occurrence of recent rain (NSW Scientific Committee 2005).

In the southern part of the distribution of Weeping Myall Woodlands (south of the mid-Lachlan region), chenopods, such as saltbushes, native cotton bushes, bluebushes, goosefoots and copperburrs, were originally an important component of the understorey. As chenopods are generally highly palatable, they have largely disappeared in areas that have been grazed by stock and/or feral animals for substantial periods of time. In the northern parts of the ecological community, chenopod shrubs are a less prominent component of the understorey (NSW Scientific Committee 2005; White *et al*. 2002). Additionally, in the northern part of the distribution winter-growing grasses, such as Wallaby Grasses (*Austrodanthonia* spp.), are less common, while summer-growing grasses, such as Mitchell Grass (*Astrebla* spp.) and Queensland Blue Grass (*Dichanthium sericeum*), are more abundant, than in the south (Benson 2006, White *et al.* 2002).

The Weeping Myall Woodlands also provide important habitat for a range of animals such as the Superb Parrot (*Polytelis swainsonii*), Painted Honeyeater (*Grantiella picta*) and the Bush Stone-curlew (*Burhinus grallarius*).

Structure

Weeping Myall Woodlands can vary in structure throughout its range. In higher rainfall areas it typically forms an open woodland. As rainfall decreases the ecological community becomes increasingly restricted, tending to sparse or scattered stands of woodland occurring in discrete bands fringing better-watered country. It can also occur as relatively narrow strips on the margins of floodplain woodland or on minor depressions or run-on areas adjacent to sandhills (White *et al.* 2002).

Soils and landscape

The Weeping Myall Woodlands generally occur on flat areas, shallow depressions or gilgais on raised (relict) alluvial plains. These areas are not associated with active drainage channels and are rarely if ever flooded (White *et al.* 2002; Keith 2004). The ecological community occurs on black, brown, red-brown or grey clay or clay loam soils.

Associated and derived ecological communities

This ecological community generally occurs as part of a mosaic of sparse to open woodlands and treeless shrublands and grasslands. Modification - through clearing, thinning, cropping, grazing and associated soil erosion and changes to fire regimes - has made it difficult to reconstruct the pre-European spatial arrangements and ecological relationships of these vegetation types (White *et al.* 2002).

The Weeping Myall Woodlands occur on arable land. Therefore much of the former range of the ecological community has been cleared for dryland/irrigated cropping or has been significantly modified by heavy grazing. Most areas remaining in good condition are in little-grazed, uncropped sites such as road reserves and Travelling Stock Routes and Reserves. These areas of structurally intact woodland tend to be relatively small and exist in a matrix of agricultural development with poor landscape connectivity.

It has been suggested that much of the treeless grasslands and herblands which are widespread in the eastern Riverina are largely derived from Weeping Myall/Old Man Saltbush (*Atriplex nummularia*) shrublands or from Cotton Bush (*Maireana* spp.)/Bladder Saltbush (*Atriplex versicaria*) shrublands (Benson 1999; White *et al.* 2002; Moore 1953; Beadle 1981). Clearing and lopping for drought fodder has removed the *Acacia pendula* woodland and grazing combined with drought and changed fire regimes has eliminated the chenopod shrubs (White *et al.* 2002).

This posited history has been questioned as there is a paucity of reliable or readily interpreted documentation of the vegetation around the time of European settlement in the mid 19th century. However, all historical accounts suggest that land use and plant and animal introductions, post settlement resulted in rapid changes to the structure, function and composition of plant communities. The precise nature of these changes remains unknown.

As it is not possible to determine whether the existing grasslands and shrubland were formerly associated with Weeping Myall Woodlands or whether they always existed as independent vegetation types, the grasslands and shrublands that now lack Weeping Myall trees are excluded from the current listing. In addition, any areas that are known to have been derived from Weeping Myall Woodlands, having lost the Weeping Myall overstorey, are not included. Derived grasslands are therefore not included in the listing. However, if a grassy or shrubby area contains dead Weeping Myall trees, it is clearly part of the Weeping Myall Woodland ecological community that is currently in a part of the cycle in which the trees have died and have not yet been replaced through a regeneration event. Accordingly, these areas are included within the definition of the ecological community.

Potential for recovery

Lopping for drought fodder and the exclusion of regeneration through continuous grazing have severely degraded the ecological community. However, a beneficial change in grazing management coupled with sufficient rainfall may return the ecological community to good condition relatively easily (Rowe 2002). Regeneration of chenopod species where they have been depleted may also require replanting.

Conversely, some changes in land use, such as conversion to long-term cropping, may lead to permanent destruction of the ecological community. Historically the main landuse has been pastoralism with sheep grazing dominating in the east and cattle in the west. However, the higher returns available from wheat and cotton cultivation compared to grazing have, in part, driven extensive clearing in the range of the ecological community over the last three decades (Bedward *et al*. 2001). This trend is continuing and the conversion of sheep grazing to cattle/cropping farming systems is a significant threat to the future recovery of the ecological community.

3. Condition Classes

The dominant overstorey species, Weeping Myall, goes through regular cycles of senescence and regeneration. As such, percentage canopy cover will fluctuate from very sparse to 30 percent. The death of canopy trees is not considered to be an indicator of poor condition.

Consequently, a patch must fit the following criteria in order to be included in the listed ecological community:

- the tree canopy is dominated (at least 50% of trees present) by living, dead or defoliated Weeping Myall trees; and
- the overstorey must have at least 5% tree canopy cover or at least 25 dead or defoliated mature Weeping Myall trees/ha; and
- the area is at least 0.5 ha in size; and
- the patch has either:
    - more than two layers of regeneration of Weeping Myall present; or
    - the tallest layer of living, dead or defoliated Weeping Myall trees is at least 4 m tall and of the vegetative cover present, 50% is comprised of native species.

Areas of leaf litter and cryptogams or soil crusts may be evident and acceptable as part of this ecological community.

Assessment of a patch must be done when 10% or more of the area is covered with either native or exotic vegetation, whether dead or alive, (this accounts for situations such as drought). Assessment timing must also consider the seasonality of understorey species. For example; in areas dominated by winter growing grass species, such as the southern extent of the community, sampling should be performed in winter. Whereas, areas dominated by summer growing grass species, such as the northern extent of the community, should be sampled in late spring to summer.

A patch is defined as a continuous area that entirely consists of an ecological community. Areas of other ecological communities such as woodlands dominated by other species are not included in a patch. The patch extends over the area up to 10 m beyond the dripline of the outermost trees where the understorey criteria are satisfied.

Areas where the understorey is not native, or areas that have been cultivated more than once in the last 30 years are considered to be so highly degraded that they cannot be returned to a state in which they could be considered part of the listed ecological community. Such areas would include single paddock trees. However, although these trees are excluded from the listed ecological community, they retain their importance as habitat for many species, and could be managed with the goal of improving fauna habitat.

4. National Context

The Weeping Myall Woodlands occurs on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland, with one small outlying patch in northern Victoria. It occurs in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South, Brigalow Belt North, Murray-Darling Depression, Nandewar and Cobar Peneplain IBRA Bioregions.

Queensland

Although the species *Acacia pendula* occurs widely in Queensland, the Weeping Myall Woodlands ecological community is restricted to small patches that occur within two regional ecosystems in Queensland. These are:

11.3.2 *Eucalyptus populnea* woodland on alluvial plains; and

11.3.28 *Casuarina cristata* ± *Eucalyptus coolabah* open woodland on alluvial plains.

Both are categorised as ‘Of Concern’ under Queensland’s *Vegetation Management Act 1995*.

Small patches of Weeping Myall trees may also occur in Regional Ecosystems 11.9.3a and 4.9.6. However, these occurrences are on different landscape and soil types (undulating country on fine grained sedimentary rocks) than the former regional ecosystems which occur on alluvial plains. Accordingly, they are not considered to be part of the listed ecological community.

New South Wales

The ecological community is listed as endangered under the NSW *Threatened Species Conservation Act 1995* as ‘Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions.’

The core distribution of the ecological community in NSW is thought to have been the Riverina bioregion. Benson (2006) identified Weeping Myall Woodlands as two vegetation communities. These are:

Vegetation Community ID 26: Weeping Myall open woodland of the Riverina and NSW South Western Slopes Bioregions; and

Vegetation Community ID 27: Weeping Myall open woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions.

A mosaic of Weeping Myall Woodland, treeless shrubland and grassland is estimated to have covered over 2 million hectares of the Riverina bioregion prior to European settlement (Moore 1953; White *et al.* 2002; Benson 2006). The distribution in northern NSW was likely to have been more patchy, with the largest continuous area extending northwest of Wee Waa from Merrywinebone and Rowena west to Walgett.

Victoria

Acacia pendula is listed as a threatened species under the Victorian *Flora and Fauna Guarantee Act 1988*. Only three small natural stands remain (Venn 2004). There is no information on the previous extent of the ecological community in Victoria, but it was likely not to have been extensive. The current extent covers only a few hectares with the main stand being represented by only three mature trees and a small number of regenerating trees. As the Victorian occurrences of Weeping Myall Woodlands were very limited in extent and are presently degraded, they have been excluded from further consideration.

5. How judged by TSSC in relation to the EPBC Act criteria.

The TSSC judges the Weeping Myall Woodlands ecological community to be eligible for listing as **endangered** under the EPBC Act. The justification against the criteria is as follows:

Criterion 1 - Decline in geographic distribution

Both the current and pre-European national extent of the ecological community are poorly known. Vegetation analyses have been undertaken in some regions, such as the Riverina and the Moree Plains, to estimate previous and current distribution, however, these efforts have been hampered by some of the attributes of the ecological community. For example, the ecological community can include extremely open (approximately 5% cover) woodlands. Many vegetation mapping projects, however, exclude vegetation with less than 10% tree canopy cover. Additionally, Weeping Myall trees are very difficult to identify on aerial photographs and satellite imagery. This has severely hampered efforts to map the current extent of the ecological community. Finally, the ecological community occurred in a dynamic mosaic with grasslands and shrublands, therefore reconstructions based on soil types are likely to be inaccurate for estimating the pre-European extent of the ecological community.

Despite these limitations, it seems clear that the central Riverina district supported extensive stands of Weeping Myall Woodlands. It was also found on the riverine plains of the Lachlan, Macquarie, Gwydir and McIntyre rivers as well as the upper Darling tributaries in Queensland, while areas south of the Murray River in Victoria only ever had minor occurrences (Keith 2004).

New South Wales

There are historical accounts of plains in the Riverina dominated by *A. pendula* and *Atriplex* including Charles Sturt's journal (Sturt 1833), maps and descriptions made by surveyors of the Narrandera and Jerilderie districts (Moore 1953), as well as first hand observations of vegetation change (Beadle 1948; Moore 1953). Also, according to Moore (1953), *A. pendula* does regenerate in grassland areas when protected from heavy grazing for a number of years.

It is clear that woody vegetation has declined significantly across the plains, particularly in the eastern Riverina (White *et al.* 2002). The typical stocking densities of the late 19th

century in the Riverina were very high (up to twice what is considered appropriate by modern dry land grazing standards). The protracted dry years of the 1890's, saw the widespread clearing of palatable trees and shrubs for fodder. The combination of high stocking rates, below average rainfall and the spread of the rabbit resulted in widespread land degradation, large scale modification of the natural vegetation and a sharp decline in agricultural productivity (White *et al.* 2002).

There is no doubt that the geographic distribution of the ecological community has declined, based on the nature of land use changes where the ecological community formerly occurred, and the highly palatable nature of the tree. The Southern/central wheatbelt has had up to 95% of native vegetation removed (Sivertsen & Metcalfe 1995). Although it is difficult to distinguish Weeping Myall trees using photography, it occurs throughout the area, although very few sizable remnants remain. It is likely that Weeping Myall was cleared at the same rate as other vegetation types, or to a greater extent due to its presence on flats that were readily amenable to intensive agricultural activity.

Estimates for percentage decline vary from 56% to 96% depending on the particular region studied (White *et al.* 2002; Miles 2001; Western Riverina Vegetation Management Committee 2001; Benson 2006; Kerr *et al.* 2003). However, the only information that refers to NSW as a whole are the vegetation communities identified by Benson (2006), based on data compiled from previous surveys and presented as a range of values. If estimates for both of Benson's Vegetation IDs 26 and 27 are combined, the Weeping Myall Woodlands have declined from an original extent of between 1 900 000 ha and 3 300 000 ha to a current extent of between 190 000 ha and 330 000 ha. This represent a decline of extent within the range 83% to 94%. This range includes most of the estimates of decline from the individual vegetation surveys referred to in Table 1 (except for the estimate of 54% by White *et al.* (2002) in the Moree Plains).

Queensland

The Weeping Myall Woodlands ecological community occurs within two Queensland Regional Ecosystems: 11.3.2 and 11.3.28. It is not yet possible to estimate the exact proportion of each regional ecosystem that comprises Weeping Myall Woodlands but it is likely to be small, at most 5% of their extent. Most of these patches of Weeping Myall Woodlands are less than 1 ha to 2 ha in area. Both of these regional ecosystems are categorised as 'Of Concern' in Queensland, which means that only 10%-30% of the original, pre-European vegetation remains. It is assumed that the Weeping Myall Woodlands components have been cleared at the same rate as all other components of these regional ecosystems. On the basis of the available information in Queensland, the current extent of the ecological community is at most 31 000 ha and it has undergone an indicative decline of about 75% (Accad *et al.* 2006).

Overall

Estimates of decline, based on a number of vegetation surveys, vary regionally and range from 56% to 96%. Considering the information available from Queensland (Accad *et al.* 2006) and New South Wales (Benson 2006), the current national extent of the Weeping Myall Woodlands ecological community lies within the range 220 000 ha to 361 000 ha and the decline in national extent lies within the range 82.1 % to 93.5%. The greatest decline appears to have occurred in NSW rather than Queensland.

None of these estimates takes condition of the remnants into account. Given that overgrazing, lack of regeneration and loss of understorey component species are widespread and ongoing, it is likely that the extent of Weeping Myall Woodlands remaining in good condition is at the lower end of the indicative range whilst the higher estimates of decline are likely to be most indicative of actual loss.

Therefore, the ecological community is **eligible** for listing as **endangered** under this criterion.

Criterion 2 - Small geographic distribution coupled with demonstrable threat

Weeping Myall Woodlands formerly occurred in the Western Plains from the NSW-Victorian border into southern Queensland and presently occurs as small pockets of isolated remnant vegetation throughout this range. Its pre-European distribution in NSW and Queensland, therefore, is indicative of the ecological community's extent of occurrence. This is estimated to be in the order of 2 021 000 ha to 3 422 000 ha (Accad *et al.* 2006; Benson 2006) and, therefore, is not considered to have a limited geographic distribution. Similarly, the current national extent is estimated to be in range 220 000 to 361 000 ha (Accad *et al.* 2006; Benson 2006), which also is not indicative of a limited geographic distribution. However, these estimates do not take condition into account and, as such, are likely to overestimate the extent of the Weeping Myall Woodlands as defined in this listing advice.

There is no doubt that this ecological community is subject to ongoing threats across its range. The severe decline in the area of occupancy of the ecological community is due largely to clearing and degradation. The Weeping Myall Woodlands occur on highly fertile and arable soils where there is considerable pressure to clear for cropping. In addition to the clearing and fragmentation associated with cropping, other threats include overgrazing by feral and domestic animals, weed invasion, and herbivory by caterpillars of the Bag-shelter Moth (*Ochrogaster lunifer*) (NSW Scientific Committee 2005).

Of particular concern is the threat posed to some of the highest quality remnants on Travelling Stock Routes and Reserves, through the increasing trend of converting intermittent grazing regimes to more intensive or set stocking regimes (Benson 1999).

While this ecological community is subject to demonstrable, ongoing threats, the geographic distribution of this ecological community is not limited. Therefore, the Weeping Myall Woodlands ecological community is **not eligible** for listing under this criterion.

Criterion 3 - Loss or decline of functionally important species

Both chenopod shrubs and Weeping Myall trees are functionally important to this ecological community and both elements have undergone substantial loss and decline.

Chenopod shrubs

In the southern part of the range of the Weeping Myall Woodlands, chenopod shrubs were originally a significant component of the understorey. Dieback events have been recorded in chenopod communities and have been attributed to caterpillars and weevil larvae, overgrazing, drought and root invasion by insects (Beadle 1948; Semple 1989). Soil type also had an influence on the onset of the dieback, as saltbush on deep, friable clays succumbed much earlier than saltbush on more compact clays.

The dieback event of 1977-1983 reduced the extant area of saltbush by 53%. While much of this has subsequently recovered, the post-dieback survey of 1987 indicated that *Atriplex vesicaria* did not completely regenerate in all areas, particularly south of Hay. It was suggested that higher grazing rates in this area, coupled with reduced seed viability (due to the long period between the onset of dieback and the regenerating rains of early 1983) may have been responsible for this. Proliferation of annual pastures during and since the dieback years has, in many areas, further impeded saltbush re-establishment. As such, artificial re-establishment by sowing may be the only feasible method of re-introducing this species to this area.

Acacia pendula

Lopping for drought fodder, especially if lopping was excessive (e.g. all branches cut) or done by mechanical means such as snapping branches off with a tractor blade can cause tree mortality. Periodic lopping does not allow the tree to grow branches out to a maximum length, changes foliage cover and reduces flowering and seed set. Seedlings of *Acacia pendula* are highly palatable to stock and the vast majority of regeneration is eaten out before plants can grow to a height out of reach of stock, native and feral browsers. This has resulted in little to no regeneration of Weeping Myall trees being observed over its range where grazing is prevalent.

Overall

Although Weeping Myall Woodlands has had an overall decline of between 82% and 94%, since European settlement, data are not available to determine an estimate of the recent decline of the dominant species over its entire range. However, Bedward *et al.* (2001) estimate a decline of 9% over almost two decades in the NSW wheatbelt and Accad *et al.* (2006) recorded a decline in Queensland of 11% over six years of the ecological community.

While concerning, this is not considered to be a substantial level of decline. Therefore, Weeping Myall Woodlands are **not eligible** for listing under this criterion.

Criterion 4 - Reduction in community integrity

The Weeping Myall Woodlands ecological community has undergone a reduction in integrity as the result of a severe reduction in the dominant tree species and changes in the understorey composition over much of its range. Weeping Myall trees (live, dead or regenerating) are often the only tree species present in the ecological community making it a strong indicator of community integrity.

Weeping Myall trees have declined across the range of the ecological community. In addition to the loss of trees through clearing and use as fodder, there is little or no effective regeneration of Weeping Myall trees over the range of the species where grazing is prevalent. While the regeneration capacity of Weeping Myall itself can be good, and relatively rapid (Charles Sturt University http://www.csu.edu.au/herbarium), seedlings are highly palatable and the vast majority of regeneration is eaten out before plants can grow to a height out of reach of stock and native and feral animals. Weeping Myall is also highly susceptible to attack by the Bag-shelter Moth (*Orchrogaster lunifer*) which can defoliate large trees to such an extent that they do not recover.

In addition to the loss of the dominant tree canopy, there have also been changes to the composition of understorey species. For instance, Bladder Saltbush (*Atriplex vesicaria*) has been lost from a large proportion of the ecological community due to heavy grazing. Regeneration of this species is unlikely due to poor seed viability and the proliferation of competing annual pasture plants. The Riparian/Floodplain remnants (which include Weeping Myall Woodlands) have characteristically high levels of site disturbance and tend to be dominated by exotic species in the herb layer. About 40% of the plant species recorded in Riparian/Floodplain remnants are exotic species (Sivertsen & Metcalfe 1995).

Also, the agricultural matrix in which much of the ecological community occurs includes irrigated crops, such as cotton. Consequently, the viability of many remnants is threatened by spray-drift from the application of aerial herbicides to control weeds, and from significantly altered hydrological regimes.

With positive human intervention such as the fencing of remnant Weeping Myall Woodlands from stock, patches of *Acacia pendula* could regenerate. However, the regeneration of chenopod species in areas where they have previously been cleared or heavily grazed is less likely.

The decline in national extent of the Weeping Myall Woodlands is severe. Very little of the ecological community remains in good condition and that which remains mostly occurs in small pockets across a formerly extensive range. The lack of ability of functionally important species, such as the chenopods, to recover, due to limited seed longevity and low competitive abilities against weeds and grazing, reduces the ability of the ecological community to recover despite the fact that weeping myall trees may be able to recover if grazing pressure was removed.

Much of the former range of the Weeping Myall Woodlands is extensively cropped and is therefore irrecoverable. In the absence of recovery actions in remnant patches, regeneration of the chenopod component of the ecological community would not be possible. However, with the removal of grazing and planting of chenopods in remnant patches in the southern component of the ecological community's distribution, it is possible that the ecological community could be successfully regenerated in the near future.

Therefore, the Weeping Myall Woodland ecological community is **not eligible** for listing under this criterion.

Criterion 5 - Rate of continuing detrimental change

This ecological community is undergoing ongoing detrimental change due to grazing and cropping. Bedward *et al.* (2001) found that in the NSW Wheatbelt, between 1985 and 2000, there was a decrease of approximately 10% in the extent of Weeping Myall and that ongoing clearing continues to be a key threat to the ecological community. Accad *et al.* (2006) record a decline in RE 11.3.2 and RE 11.3.28 of 11% in the six years between 1997 and 2003 and it is assumed that the Weeping Myall Woodlands component of these regional ecosystems have declined at a similar rate. These estimates are equivalent to a decline of about 5 to 18% per decade and apply to the immediate past. The impact of the recent changes to Queensland's vegetation management legislation have yet to be qualified in terms of clearance rates for these Regional Ecosystems. These rates of detrimental change are not considered sufficient to trigger this criterion.

Therefore this ecological community is **not eligible** for listing under this criterion.

Criterion 6 - Quantitative analysis showing probability of extinction

There are no quantitative data available to assess Weeping Myall Woodland under this criterion. Therefore, it is **not eligible** for listing under this criterion.

6. Conclusion

The **Weeping Myall Woodlands** ecological community meets criterion one as endangered as it has undergone a severe decline in geographic distribution.

7. Recommendation

TSSC recommends that the list referred to in section 181 of the EPBC Act be amended by including in the list in the **endangered** category: “Weeping Myall Woodlands”

8. Priority for the development of a recovery plan: High

All known patches of this ecological community are subject to ongoing threats and very little occur within conservation reserves.

Associate Professor Robert J.S. Beeton

Chair

Threatened Species Scientific Committee

Appendix 1. Vegetation Characteristics:

Characteristic Trees		*Acacia pendula; Alectryon oleifolius* subsp. *canescens; Alectryon oleifolius* subsp. *elongatus; Atalaya hemiglauca; Capparis mitchellii; Casuarina cristata; Eucalyptus camaldulensis* subsp. *camaldulensis; Eucalyptus largiflorens; Eucalyptus melliodora; Eucalyptus populnea* subsp. *bimbil.*
Characteristic understorey (Shrubs/Vines/Epiphytes)		*Acacia farnesiana; Acacia salicina; Acacia stenophylla; Acacia oswaldii; Amyema quandang* var. *quandang; Atriplex nummularia; Atriplex versicaria; Chenopodium nitrariaceum; Hakea tephrosperma; Pimelea neo-anglica; Maireana aphylla; Maireana decalvans; Maireana pentagona; Muehlenbeckia florulenta; Myoporum montanum; Rhagodia spinescens; Santalum lanceolatum; Sclerolaena muricata* var. *muricata.*
Characteristic Groundcover		*Alternanthera denticulata; Astrebla lappacea; Astrebla pectinata; Atriplex leptocarpa; Atriplex semibaccata; Atriplex spinibractea; Atriplex stipitata; Aristida leptopoda; Austrodanthonia bipartita; Austrodanthonia caespitosa; Austrodanthonia setacea; Austrostipa aristiglumis; Austrostipa blackii; Austrostipa nodosa; Austrostipa verticillata; Calotis cuneifolia; Calotis scabiosifolia* var. *integrifolia; Centipeda cunninghamii; Chloris truncata; Convolvulus clementii; Craspedia variabilis; Crinum flaccidum; Crotalaria dissitiflora* subsp. *dissitiflora; Cullen tenax; Daucus glochidiatus sens. lat.; Dichanthium sericeum* subsp. *sericeum; Einadia nutans* subsp. *nutans; Enchylaena tomentosa; Enteropogon acicularis; Eragrostis leptostachya; Eragrostis parviflora; Eriochloa pseudoacrotricha; Eryngium paludosum; Goodenia fascicularis; Goodenia glauca; Iseilema membranaceum; Leiocarpa leptolepis; Leiocarpa panaetioides; Leiocarpa tomentosa; Lepidium pseudohyssopifolium; Marsilea hirsuta; Myriocephalus rhizocephalus; Oxalis perennans; Plantago varia; Pycnosorus thompsonianus; Rhodanthe corymbiflora; Rostellularia adscendens* subsp. *adscendens; Sclerolaena brachyptera; Sclerolaena limbata; Sida corrugata; Solanum esuriale; Sporobolus actinocladus; Sporobolus caroli; Sclerolaena stelligera; Swainsona galegifolia; Themeda avenacea; Verbena gaudichaudii; Vittadinia cuneata* var. *cuneata* f. *cuneata; Vittadinia cuneata* var. *cuneata* f. *minor; Wahlenbergia gracilis; Walwhalleya proluta.*

Publications used to assess the nomination

Accad, A., Neldner, V.J., Wilson, B.A. & Niehus, R.E. (2006). *Remnant vegetation in Queensland. Analysis of remnant vegetation 1997-1999-2000-2003, including regional ecosystem information.* Queensland Herbarium, Qld Environmental Protection Agency.

Beadle, N.C.W. (1948). *The vegetation and pasture of western New South Wales with special reference to soil erosion.* Department of Conservation of New South Wales, Sydney.

Beadle, N.C.W. (1981). *The Vegetation of Australia*. Cambridge University Press, Cambridge.

Bedward, M., Sivertsen, D.P., Metcalfe, L.M., Cox, S.J. and Simpson, C.S. (2001). *Monitoring the rate of woody vegetation change in the New South Wales wheatbelt.* Final Project Report to the Natural Heritage Trust/Environment Australia. NPWS, Sydney.

Benson, J.S. (1999). *Setting the scene: the native vegetation of New South Wales.* Native Vegetation Advisory Council of NSW Background Paper No. 1. Native Vegetation Agency Council, Sydney.

Benson, J.S. (2006). New South Wales Vegetation Classification and Assessment: Introduction – the classification, database, assessment of protected areas and threat status of plant communities. *Cunninghamia* 9(3): 331-381, Sydney.

Charles Sturt University. *South West Slopes Revegetation Guide*. Accessed on 26.10.2006 at http://www.csu.edu.au/herbarium.html.

Keith, D. (2004). *Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT.* NSW Department of Environment and Conservation, Sydney.

Kerr, M., Jowett, A. and Robson, D. (2003). *Reconstructed Distribution and Extent of Native Vegetation within the Lower Macquarie-Castlereagh Region.* NSW National Parks and Wildlife Service, Western Directorate, Dubbo.

Miles, C. (2001). *NSW Murray Catchment: Biodiversity action plan.* Nature conservation working group Inc.: Albury.

Moore, C.W.E. (1953). The vegetation of the south-eastern Riverina, NSW 1: the climax communities. *Aust. J. Botany* 1:485-547.

NSW Scientific Committee (2005). *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions - endangered ecological community listing* - final determination.

Rowe, M. (2002). Chapter 1: Current Status of Native Vegetation in the Riverina *in* Kent, K., Earl, G., Mullins, B., Lunt, I. and Webster, R. (eds) (2002) *Native Vegetation Guide for the Riverina.* Charles Sturt University, Berrigan Shire and Native Dog Landcare Group.

Semple, W.S. (1989). *Further comments on the dieback and regeneration of Bladder Saltbush* (Atriplex versicaria) *on the Riverine Plain during the 1970s and 1980s.* Technical Report No. 23, Soil Conservation Service of NSW, Sydney.

Sivertsen, D. & Metcalfe, L. (1995). Natural vegetation of the southern wheat-belt (Forbes and Cargelligo 1:250 000 map sheets). *Cunninghamia* 4(1):103-128, Sydney.

Sturt, C. (1833). *Two expeditions into the interior of southern Australia during years 1828-1829 and 1839-1841.* Australian Facsimile Edition No. 5. Libraries Board of South Australia 1965, Adelaide.

Venn, D.R. (2004). *Action Statement No. 86; Flora and Fauna Guarantee Act 1988; Weeping*

Myall, Acacia pendula. Department of Sustainability and Environment, Melbourne.

Western Riverina Vegetation Management Committee (2001). *Draft Western Riverina Regional Vegetation Management Plan* (Western Riverina RVC) Deniliquin.

White, M., Muir, A.M. and Webster, R. (2002). *The reconstructed distribution of indigenous vegetation types across the NSW Riverina.* A draft report to the NSW National Parks and Wildlife Service. NSW National Parks and Wildlife Service. Ecology Australia Pty. Ltd., Fairfield.