NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Final Determination under Section 23 of the Act to support a proposal for the inclusion of Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion as a CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY in Part 2 of Schedule 1A of the Act, and as a consequence to omit reference to Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion from Part 3 of Schedule 1 of the Act.

This determination contains the following information:

Parts 1 & 2: Section 4 of the Act defines an ecological community as "an assemblage of species occupying a particular area". These features of Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion are described in Parts 1 and 2 of this Determination, respectively.

Part 3: Part 3 of this Determination describes the eligibility for listing of this ecological community in Part 2 of Schedule 1A of the Act according to criteria as prescribed by the *Threatened Species Conservation Regulation 2010*.

Part 4: Part 4 of this Determination provides additional information intended to aid recognition of this community in the field.

Part 1. Assemblage of species

1.1 Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion (hereafter referred to as the Hunter Valley Weeping Myall Woodland) is characterised by the assemblage of species listed below.

Acacia gunnii
Acacia homalophylla–Acacia melvillei complex
Acacia implexa
Acacia pendula
Acacia salicina
Allocasuarina luehmannii
Amyema congener subsp. *congener*
Aristida ramosa
Arthropodium minus
Austrodanthonia bipartita
Austrodanthonia fulva
Austrodanthonia setacea
Austrodanthonia spp.
Bothriochloa macra
Brachychiton populneus subsp. *populneus*
Callitris endlicheri
Calocephalus citreus
Canthium buxifolium
Cheilanthes distans
Chenopodium carinatum
Elymus scaber var. *scaber*
Enchylaena tomentosa
Enteropogon acicularis
Eragrostis alveiformis
Eremophila debilis
Eucalyptus crebra
Eucalyptus dawsonii
Geijera parviflora
Geijera salicifolia var. *salicifolia*
Lomandra multiflora subsp. *multiflora*
Lysiana exocarpi subsp. *tenuis*
Maireana enchylaenoides
Maireana microphylla
Minuria leptophylla
Monachather paradoxus
Myoporum montanum
Notelaea microcarpa var. *microcarpa*
Pandorea pandorana subsp. *pandorana*
Panicum effusum
Poa sieberiana

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Chenopodium glaucum
Chloris truncata
Chrysocephalum apiculatum
Chrysocephalum semipapposum
Cymbopogon refractus
Cynodon dactylon
Dodonaea viscosa
Einadia hastata
Einadia nutans subsp. *linifolia*
Einadia nutans subsp. *nutans*
Einadia polygonoides
Psydrax odorata subsp. *buxifolia*
Ptilotus nobilis subsp. *semilanatus*
Rhagodia parabolica
Rytidosperma fulvum
Sarcostemma australe
Sclerolaena muricata
Senna artemisioides subsp. *zygophylla*
Senna australis
Spartothamnella juncea
Sporobolus caroli
Themeda australis

1.2 The total species list of the community across all occurrences is likely to be considerably larger than that given above. Due to variation across the range of the community, not all of the above species are present at every site and many sites may also contain species not listed above.

Characteristic species may be abundant or rare and comprise only a subset of the complete list of species recorded in known examples of the community. Some characteristic species show a high fidelity (are relatively restricted) to the community, but may also occur in other communities, while others are more typically found in a range of communities.

The number and identity of species recorded at a site is a function of sampling scale and effort. In general, the number of species recorded is likely to increase with the size of the site and there is a greater possibility of recording species that are rare in the landscape.

Species presence and relative abundance (dominance) will vary from site to site as a function of environmental factors such as soil properties (chemical composition, texture, depth, drainage), topography, climate, and through time as a function of disturbance (e.g. fire, logging, grazing) and weather (e.g. flooding, drought, extreme heat or cold).

At any one time, above ground individuals of some species may be absent, but the species may be represented below ground in the soil seed bank or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers.

The species listed above are vascular plants, however the community also includes micro-organisms, fungi and cryptogamic plants as well as vertebrate and invertebrate fauna. These components of the community are less well documented.

Part 2. Particular area occupied by the ecological community

2.1 The assemblage of species listed in Part 1.1 above which characterises the Hunter Valley Weeping Myall Woodland occurs within the Sydney Basin Bioregion. This Bioregion is defined by SEWPaC (2012) Interim Biogeographic Regionalisation for Australia, Version 7. Department of Sustainability, Environment, Water, Population and Communities. http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/maps.html

2.2 It is the intent of the Scientific Committee that all occurrences of the ecological community (both recorded and as yet unrecorded, and independent of their condition) that occur within this bioregion be covered by this Determination.

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Part 3. Eligibility for listing

3.1 Reasons for determining eligibility for listing

3.1.1 Hunter Valley Weeping Myall Woodland was listed as an Endangered Ecological Community under the Act in 2005 (NSW Scientific Committee 2005). At the time of the assessment the Critically Endangered category did not exist. Since this original listing, new data have become available and the Scientific Committee has undertaken a review of the conservation status of the ecological community to inform the current listing status under the Act.

3.1.2 Hunter Valley Weeping Myall Woodland has undergone a very large reduction in distribution. The pre-European distribution of Hunter Valley Weeping Myall Woodland is estimated to have ranged between 50 and 200 ha (Umwelt 2006). Recent estimates suggest that the distribution of Hunter Valley Weeping Myall Woodland has been reduced by 70–93% and fewer than 15 ha remain (OEH NSW 2013).

3.1.3 Major threats to Hunter Valley Weeping Myall Woodland include habitat loss and fragmentation associated with land clearing for agriculture, mining and urban/residential development, grazing by domestic livestock, weed invasion, road maintenance, inappropriate fire regimes associated with changes to the community structure and proximity to agricultural and urban infrastructure and possibly through subsidence associated with longwall mining (OEH NSW 2013). Grazing also impacts on the community as young *Acacia pendula* (Weeping Myall) plants are palatable to cattle (Orchard and Wilson 2001). Several remnants are also used as cattle camps resulting in soil compaction, nutrient enrichment and tree damage which can degrade the community, limit regeneration and potentially change the structure and composition. Invasive weeds also impact on this community, especially the understorey with invasion by *Asparagus asparagoides* (Bridal Creeper), *Bryophyllum delagoense* (Mother of Millions) and *Galenia pubescens* (Galenia) prevalent at Jerry Plains, one of the most intact remnants (OEH NSW 2013). A relatively large remnant on Wambo Coal Mine land at Warkworth may be at risk if longwall mining causes subsidence and flooding (Umwelt 2006). Remnants on road verges may be damaged by maintenance activities such as spraying and grading (OEH NSW 2013). 'Clearing of native vegetation', 'Invasion of native plant communities by escaped garden plants, including aquatic plants' and 'Alteration of habitat following subsidence due to longwall mining' are listed as Key Threatening Processes under the Act.

3.2 Criteria for listing

Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion is eligible to be listed as a Critically Endangered Ecological Community in accordance with Section 12 of the Act as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

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Clause 17 Reduction in geographic distribution of the ecological community
The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

(a) a very large reduction in geographic distribution.

Clause 19 Reduction in ecological function of the ecological community
The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

(a) a very large reduction in ecological function,

as indicated by any of the following:

(d) change in community structure,
(e) change in species composition,
(f) disruption of ecological processes,
(g) invasion and establishment of exotic species,
(h) degradation of habitat,
(i) fragmentation of habitat.

Dr Mark Eldridge
Chairperson
NSW Scientific Committee

Exhibition period: 19/02/16 – 15/04/16 Proposed Gazettal date: 19/02/16

Part 4. Additional information about the ecological community

The following information is additional to that required to meet the definition of an ecological community under the Act, but is provided to assist in the recognition of Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion. Given natural variability, along with disturbance history, Hunter Valley Weeping Myall Woodland may sometimes occur outside the typical range of variation in the features described below.

4.1 Hunter Valley Weeping Myall Woodland is typically a mid-high (to 15 m) open forest or woodland with a dense to mid-dense canopy dominated by Weeping Myall (*Acacia pendula*) depending on disturbance and regrowth history; (Peake 2005; Umwelt 2006). Weeping Myall may be found to occur with *Eucalyptus crebra* (Narrow-leaved Ironbark), *A. salicina* (Cooba) and/or trees within the *Acacia homalophylla–A. melvillei* complex. Understorey shrubs may include *Canthium buxifolium* (Stiff Canthium), *Dodonaea viscosa* (Sticky Hopbush), *Geijera parviflora* (Wilga), *Notelaea microcarpa* var. *microcarpa* (Native Olive) and *Senna artemisioides* subsp. *zygophylla*. However, the shrub stratum is absent from some stands. The groundcover varies from dense to sparse and is comprised of grasses, such as *Austrodanthonia fulva* (Wallaby Grass) and *Themeda australis* (Kangaroo Grass) and low shrubs and herbs, such as *Chrysocephalum apiculatum* (Common Everlasting), *Einadia nutans* subsp. *nutans* (Climbing Saltbush), *Enchylaena tomentosa* (Ruby Saltbush), *Maireana microphylla* (Eastern Cotton Bush) and *Ptilotus nobilis* subsp. *semilanatus* (Mulla Mulla) (NSW Scientific Committee 2005). The floristic composition of Hunter Valley Weeping Myall Woodland is similar to grassy box woodlands occurring to the west of the Hunter Valley (Bell 2012) and may include a number of species distributed primarily west of the Great Dividing Range with outlying populations in the upper Hunter Valley (*Acacia pendula, A.*

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homalophylla-A. melvillei complex, *Acacia salicina, Geijera parviflora, Maireana microphylla, Notelaea microcarpa* var. *microcarpa, Minuria leptophylla, Calocephalus citreus, Acacia melvillei, Enteropogon acicularis, Eragrostis alveiformis* and *Ptilotus nobilis* subsp. *semilanatus*). Remnants at Jerrys Plains Cemetery and Wambo Coal Mine at Warkworth are less affected by disturbance and are more structurally complex and floristically diverse than other occurrences (Umwelt 2006). As such, these remnants are likely to most closely resemble the community prior to European settlement (OEH NSW 2013). A remnant at Wybong/Anvil Hill also supports a reasonably diverse native understorey (Umwelt 2006) but most remnants are small, isolated and highly degraded (OEH NSW 2013).

4.2 Hunter Valley Weeping Myall Woodland has a highly restricted distribution. The extent of occurrence of Hunter Valley Weeping Myall Woodland is estimated to be between 495 and 1714 km^2, based on a minimum convex polygon enclosing all known occurrences of the community, the method of assessment recommended by IUCN (2014). The estimated area of occupancy (AOO) is between 68 and 84 km^2, which is equivalent to 17 and 21 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2014). Most of the Hunter Valley Weeping Myall Woodland remnants occur on private land and road verges with no occurrences in formal conservation reserves (OEH NSW 2013).

4.3 Hunter Valley Weeping Myall Woodland was described in Peake's (2006) vegetation survey of the central Hunter Valley. A number of vegetation surveys and mapping studies carried out in the Lower Hunter – Central Coast (NPWS 2000), Maitland local government area (Hill 2003), Myanbat Military Area (Thomas 1998) and Yengo (Bell *et al.* 1993), Wollemi (Bell 1998) and Goulburn River National Parks (Hill 2000) have not detected the community. Hunter Valley Weeping Myall Woodland is included within the 'Western Vine Thickets' vegetation class of Keith (2004). It also contains a number of species that are characteristic of the 'Riverine Plain Woodlands' vegetation class, including the dominant tree species, *Acacia pendula*. However, Hunter Valley Weeping Myall Woodland occurs well outside the distribution of other communities that typify both of these classes of vegetation (Keith 2004). This community occurs on heavy soils sometimes on the margins of small floodplains but also in more undulating locations remote from floodplains (OEH NSW 2013).

4.4 Hunter Valley Weeping Myall Woodland occurs on soils derived from Quaternary alluvium and sedimentary rocks of Permian age, including lithic sandstone, shale, siltstone, mudstone, conglomerate and coal bearing seams (Kovac and Lawrie 1991). It is primarily restricted to locations near the valley floor, associated with floodplains and low undulating hills (Umwelt 2006) in areas receiving less than 725 mm of annual rainfall (Tozer and Chalmers 2015). The occurrence of species of primarily western distribution in this area of the upper Hunter Valley has been associated with a migration corridor along the Goulburn River Valley facilitated by a low elevation passage over the Great Dividing Range (Beadle 1981) and a rain-shadow corresponding to an easterly extension of the Central Western Slopes Botanical Subdivision (Harden 1990; Tozer and Chalmers 2015). Historical migration patterns of species along this corridor are unknown and, as a consequence, the pre-European distribution of key species such as *A. pendula* is uncertain (Bell and Driscoll 2014).

4.5 Hunter Valley Weeping Myall Woodland is included within the critically endangered ecological community listed under the *Environment Protection and Biodiversity Conservation Act* 1995 as "Hunter Valley Weeping Myall (*Acacia pendula*) Woodland of the Sydney Basin Bioregion" (TSSC 2005). A number of remnants of this community totalling less than 15 ha are known with most of these being found on private land and road verges with none in a conservation reserve

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(Umwelt 2006; OEH NSW 2013). Ten of the remnants under private tenure occur on agricultural land while four are located within buffer areas around coal mines while another two occur on Railcorp easements (OEH NSW 2013).

4.6 The Hunter Valley Weeping Myall Woodland has been recorded in the Singleton and Muswellbrook local government areas in the mid and upper Hunter Valley from Wybong in the north to Broke in the south (OEH NSW 2013). However, unrecorded stands of the ecological community may occur elsewhere in the Sydney Basin Bioregion.

4.7 Hunter Valley Weeping Myall Woodland contains a number of threatened animal species, listed in the table below.

Species	Common name	NSW TSC	EPBC
Birds			
Certhionyx variegatus	Pied Honeyeater	Vulnerable	
Chthonicola sagittata	Speckled Warbler	Vulnerable	
Circus assimilis	Spotted Harrier	Vulnerable	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	
Glossopsitta pusilla	Little Lorikeet	Vulnerable	
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable
Hieraaetus morphnoides	Little Eagle	Vulnerable	
Melanodryas cucullata cucullata	Hooded Robin (eastern subspecies)	Vulnerable	
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	
Stagonopleura guttata	Diamond Firetail	Vulnerable	
Mammals			
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Vulnerable
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	
Mormopterus norfolkensis	Eastern Freetail-bat	Vulnerable	
Myotis macropus	Southern Myotis	Vulnerable	
Petaurus norfolcensis	Squirrel Glider	Vulnerable	
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	
Reptiles			
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	
Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	

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