

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 56

**Common Name:** Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW

**Scientific Name:** *Eucalyptus populnea* subsp. *bimbil* - *Casuarina cristata* / *Geijera parviflora* - *Alectryon oleifolius* subsp. *canescens* - *Rhagodia spinescens* - *Sclerolaena birchii* / *Chloris truncata* - *Einadia nutans* subsp. *nutans* - *Enteropogon acicularis* - *Oxalis chnoodes*

**Veg. Comm. ID.:** 56 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID56a\_BBS NOV 2007 0073.jpg  
*Eucalyptus populnea* - *Casuarina cristata*  
woodland on alluvial plains, Croppa Road north-east of Moree, [AGD66 29°14'49.1"S 150°11'22.7"E], 13/11/2008, Jaime Plaza.



**Photo 2:** ID56b\_dsc\_1773.jpg *Eucalyptus populnea* - *Casuarina cristata* woodland, Merri Merri Creek, [AGD66 31°14'46"S 148°13'10"E], 17/8/03, Jaime Plaza.



### Characteristic Vegetation: (Quantitative Data)

**Trees:** *Eucalyptus populnea* subsp. *bimbil*; *Casuarina cristata*; *Allocasuarina luehmannii*; *Callitris glaucophylla*; *Eucalyptus microcarpa*; *Atalaya hemiglaucula*; *Corymbia tessellaris*.

**Shrubs/Vines/Epiphytes:** *Geijera parviflora*; *Alectryon oleifolius* subsp. *canescens*; *Rhagodia spinescens*; *Sclerolaena birchii*; *Sclerolaena muricata*; *Capparis mitchellii*; *Enchylaena tomentosa*; *Myoporum montanum*; *Alectryon oleifolius* subsp. *elongatus*; *Apophyllum anomalum*; *Capparis lasiantha*; *Santalum acuminatum*; *Abutilon oxycarpum*; *Citrus glauca*; *Maireana decalvans*; *Eremophila deserti*; *Notelaea microcarpa* var. *microcarpa*.

**Ground Cover:** *Chloris truncata*; *Einadia nutans* subsp. *nutans*; *Enteropogon acicularis*; *Oxalis chnoodes*; *Austrostipa scabra* subsp. *scabra*; *Dichanthium sericeum* subsp. *sericeum*; *Aristida jerichoensis* var. *jerichoensis*; *Tetragonia moorei*; *Austrostipa verticillata*; *Aristida behriana*; *Bulbine alata*; *Erodium crinitum*; *Wahlenbergia fluminalis*; *Brachyscome heterodonta* var. *heterodonta*; *Galium gaudichaudii*; *Diplachne muelleri*; *Pycnosorus globosus*; *Goodenia fascicularis*; *Ptilotus exaltatus* var. *exaltatus*; *Calocephalus sonderi*; *Sida filiformis*; *Thellungia advena*; *Pratia concolor*; *Velleia paradoxa*; *Phyllanthus virgatus*; *Ajuga australis*; *Malvastrum coromandelianum*; *Eragrostis leptostachya*; *Vittadinia sulcata*; *Wahlenbergia communis*; *Eragrostis elongata*; *Cyperus betchei* subsp. *betchei*; *Atriplex leptocarpa*; *Sporobolus actinocladius*; *Maireana decalvans*; *Sclerolaena stelligera*; *Sclerolaena tricuspis*; *Maireana coronata*; *Lomandra multiflora* subsp. *multiflora*; *Brunoniella australis*; *Wahlenbergia gracilis*.

**Weed Species:** *Rapistrum rugosum*; *Erodium cicutarium*; *Medicago polymorpha*.

**Weediness:** Medium (5-15%) with <10% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 16 (20 x 20 plots in floristic group 200 in RACAC 2004).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Woodland.

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**Height Class (WH):** Mid-High; Tall.

**Vegetation Description:** Tall to mid-high woodland dominated by Poplar Box (*Eucalyptus populnea* subsp. *bimbil*) and Belah (*Casuarina cristata*) commonly with the small tree Western Rosewood (*Alectryon oleifolius*). Tall shrubs are sparse and include Wilga (*Geijera parviflora*), Warrior Bush (*Apophyllum anomalum*), *Capparis* spp., *Citrus glauca* and Thorny Rhagodia (*Rhagodia spinescens*). Low shrubs include Galvanized Burr (*Sclerolaena birchii*), Black Roly Poly (*Sclerolaena muricata*), other copperburs, *Maireana coronata*, *Maireana decalvas* and *Enchylaena tomentosa*. The ground cover is sparse during dry times but mid-dense after rain and includes grasses such as *Chloris truncata*, *Enteropogon acicularis* and *Austrostipa scabra* subsp. *scabra*. Forb species include *Einadia nutans* subsp. *nutans*, *Oxalis chnoodes*, *Bulbine alata*, *Erodium crinitum*, *Wahlenbergia fluminalis* and *Brachyscome heterodontia*. Generally occurring on pink to brown loamy sand or light clay in the transition zone between the floodplain and the peneplain in the central and northern plains of the NSW wheatbelt in the temperate (no dry season - hot summer) and dry subtropical climate zones with annual precipitation between 300 and 550 mm. As of 2008, more than half of this community had been cleared. On-going threats include clearing, weed invasion and lack of recruitment of some species due to grazing pressure.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** Eucalyptus (Mostly Grassy) Box Woodlands of the Inland Plains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus woodlands with a grassy understorey.

**Forest Type (RN 17):** 212 - Belah (P); 203 - Western Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes Floristic Group 200 in RACAC (2004). Much of map unit P7 in Sivertsen & Metcalfe (2001) updated for all but Walgett region in Bedward et al. (2001). Includes BVT8 in Kerr et al. (2003). Includes map units Poplar Box - Belah map unit in Peasley (2000) and NFPC (2004) covering the Walgett, Brewarrina and part of Bourke Shires. Includes map units E31f and E31i in Peasley (2001) covering the Moree Plains Shire. Listed in Mid-Lachlan draft plan (MLRVC 1999). Community 4 in Hunter (2006h). Also described as community E3 in Beeston et al. (1980) as Poplar Box - Belah. Mentioned by Pickard & Norris (1994) as a sub-unit of their map unit 5 in east. Part of BVT 72 in DEC (2006, 2006a). A widespread community of the NSW central northern plains.

**Interstate Equivalent(s):** Queensland: may be similar to regional ecosystem 11.3.17.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Adequate.

**Mapping Info:** Assumed to be the majority of map unit P7 in Sivertsen & Metcalfe (1995) and Sivertsen & Metcalfe (2001). Also includes Poplar Box-Belah map unit (70000 ha) in Peasley (2000, 2001) and NFPC (2004). Composite map for Darling Riverine Plain in DeVries et al. (2002).

**Climate Zone:** Dry subtropical: moderately dry winter; Temperate: no dry season (hot summer).

**IBRA Bioregion (v6):** Brigalow Belt South (1-30%); Cobar Peneplain (1-30%); Darling Riverine Plains (30-70%); NSW South-western Slopes (1-30%).

**IBRA Sub-Region:** Bogan-Macquarie (1-30%); Castlereagh-Barwon (30-70%); Lower Slopes (1-30%); Moonie - Barwon Interfluve, Collarenebri Interfluve (1-30%); Nymagee (1-30%); Pilliga Outwash (1-30%); Warrambool-Moonie (1-30%); Northern Outwash (1-30%).

**Botanical Division:** North Western Plains (NWP) (>70%); South Western Plains (SWP) (1-30%).

**Local Govt. Areas:** Bogan (1-30%); Coonamble (1-30%); Dubbo (1-30%); Forbes (1-30%); Gilgandra (1-30%); Lachlan (1-30%); Moree Plains (1-30%); Narrabri (1-30%); Narromine (1-30%); Parkes (1-30%); Walgett (1-30%); Warren (1-30%).

**CMAs:** Border Rivers-Gwydir (30-70%); Central West (30-70%); Lachlan (1-30%); Namoi (1-30%); Western (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium.

**Lithology:** Alluvial loams and clays.

**Great Soil Group:** Grey clay; Grey earth; Red earth; Solodized solonetz.

**Soil Texture:** Clay loam; Clay loam, sandy; Heavy clay; Light medium clay.

**Landform Patterns:** Alluvial plain.

**Landform Elements:** Drainage depression; Plain.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 450000 ha  $\pm$ 60%. Estimated based on maps of current vegetation.

**Pre-European Extent Comments:** Estimate based on landscapes cleared and current extent vegetation maps.

**Current Extent:** 100000 ha  $\pm$ 30% or 22%  $\pm$  80% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from a more broadly classified vegetation map). Over 110000 ha is mapped as Poplar Box-Belah in Peasley (2000, 2001) and NFPC (2004). Assumed to be 4/5s of map unit P7 in Sivertsen & Metcalfe (1995) and Sivertsen & Metcalfe (2001) (ie 43000 ha). About 2500 ha occurs in the BBS Bioregion (RACAC 2004). Mostly cleared in the wheatbelt but larger areas remain in the Western Division.

**Conservation Reserves:** Boronga NR 10 (E3); Macquarie Marshes NR 200 (M); Boomi NR 5 (E3); Boomi West NR 10 (E2); Gamilaroi NR 4 (M); Bobbiwaa CCAZ3 50 (M); Killarney CCAZ3 20 (E2).

**Reserves Total Area:** 299 ha.

**No. Representatives in Reserves:** 7

**Protected Area Explanation:** Boronga NR area from Peasley (2001), Auld (1981) and Porter (1971). Boomi and Boomi West NRs estimates from descriptions in community 3 in Hunter (2006a). Macquarie Marshes NR from Johnson & Wilson (1991) including 2003 eastern addition. Gamilaroi NR from community 4 in Hunter (2006h). Bobbiwaa SCA from Hunter et al. (2008c). Killarney SCA part of community 4 in Hunter et al. (2008d).

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 0.29% 299 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 7

**Protected Pre-European Extent:** 0.06% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Investigate recent vegetation maps and follow up with property agreements or nature reserves after checking condition. Currently very poorly protected. Marra Marra Creek may be one area of importance.

**Degree of Fragmentation:** Human induced fragmented stands with <60% >30% extent remaining and moderate edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if

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causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Floristic changes from north to south with Coolabah being more common in the north. Eastern outliers in the BBS Bioregion contain different some different shrubs and ground cover.

**Fire Regime:** Most remnants are now rarely burnt due to their isolation. Pre-European fire regime is unknown.

**Adjoining Communities:** Grades into Belah (ID55) along drainage lines and on heavier soils, and into Coolabah Box/Black Box (ID37, 39, 40) on floodplains on heavier clay soils. Often adjoins and intergrades with *Acacia pendula* low woodland (ID27) or Poplar Box grassy woodland (ID244). In BBS Bioregion grades into Pilliga Box woodland or White Cypress Pine dominated woodlands.

**Threatening Processes:** Clearing for cropping in the wheatbelt has reduced this community substantially over the last few decades and this is continuing. Weed invasion and continuous grazing also continues to be a threat.

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Dryland cropping; Soil erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion; Woody shrub (native) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Requires protection under relevant catchment plans and to be better sampled under property agreements.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (288; 142; 32; 318; 67; 29; 68; 210; 27; 34; 46; 372; 373; 389; 335; 457). Bedward, M., Sivertsen, D.P., Metcalfe, L.M., Cox, S.J. & Simpson, C.S. (2001) Monitoring the rate of native woody vegetation change in the New South Wales wheatbelt. Natural Heritage Trust report. (NSW National Parks and Wildlife Service: Hurstville); Beeston, G.R., Walker, P.J., Purdie, R. & Pickard, J. (1980) Plant communities of the Poplar Box (*Eucalyptus populnea*) lands of eastern Australia. Australian Rangelands 2: 1-30; Johnson, W. & Wilson, R. (1991) Macquarie Marshes vegetation map. Unpublished. (NSW National Parks and Wildlife Service: Hurstville); Kerr, M., Jowett, A. & Robson, D. (2003) Reconstructed distribution and extent of native vegetation within the lower Macquarie-Castlereagh Region. Unpublished Report. (NSW National Parks and Wildlife Service, Western Directorate: Dubbo); Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Northern Floodplains Planning Committee (2004) Vegetation communities of the northern floodplains western New South Wales. Book 1: Western Division of the Walgett Shire, Book 2: Brewarrina Shire, Book 3: eastern part of Bourke Shire (NFPC: Walgett); Peasley, B. (2000) East Walgett vegetation mapping extant vegetation. Unpublished GIS vegetation map. (DLWC: Sydney, Inverell); Peasley, B. (2001) Vegetation map of Moree Plains Shire. (Department of Land and Water Conservation: Inverell); Pickard, J. & Norris, E.H. (1994) The natural vegetation of north-western New South Wales: notes to accompany the 1:1 000 000 vegetation map sheet. *Cunninghamia* 3(3): 423-464; 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; Sivertsen, D. & Metcalfe, L. (2001) Northern wheatbelt vegetation mapping. Unpublished 1:250 000 scale vegetation maps and vegetation descriptions covering northern NSW wheatbelt. (NSW National Parks and Wildlife Service: Hurstville); DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); Hunter, J.T. (2006a) Vegetation and floristics of Boronga, Boomi and Boomi West Nature Reserves. Report to NSW Parks and Wildlife Service; Resource and Conservation Assessment Council of NSW (RACAC) (2004) Joint vegetation mapping project, Brigalow Belt South Western Regional Assessment Stage 2 Resource and Conservation Division, Department of Infrastructure, Planning and Natural Resources; Hunter, J.T. (2006h) Vegetation and floristics of Gamilaroi Nature Reserve. Report to NSW Parks and Wildlife Service.



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 70

**Common Name:** White Cypress Pine woodland on sandy loams in central NSW wheatbelt

**Scientific Name:** *Callitris glaucophylla* / *Acacia deanei* subsp. *deanei* - *Dodonaea viscosa* - *Maireana enchylaenoides* - *Geijera parviflora* / *Einadia nutans* subsp. *nutans* - *Austrostipa scabra* subsp. *scabra* - *Austrodanthonia eriantha* - *Sida corrugata*

**Veg. Comm. ID.:** 70 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID70a\_img141pc.jpg *Callitris glaucophylla* woodland, Hillston-Rankins Springs Rd, [AGD66 33°42'30.3"S 146°02'36.0"E], 18/4/02, Jaime Plaza.



**Photo 2:** ID70b\_img152pc.jpg *Callitris glaucophylla*/Acacia deanei subsp. deanei woodland Back Creek State Forest, [AGD66 33°52'24.8"S 147°21'46.6"E], 19/4/02, Jaime Plaza.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Callitris glaucophylla*; *Eucalyptus populnea* subsp. *bimbil*; *Eucalyptus microcarpa*; *Casuarina cristata*; *Allocasuarina luehmannii*; *Brachychiton populneus* subsp. *populneus*; *Alstonia constricta*; *Alectryon oleifolius* subsp. *canescens*.

**Shrubs/Vines/Epiphytes:** *Acacia deanei* subsp. *deanei*; *Dodonaea viscosa*; *Maireana enchylaenoides*; *Rhagodia spinescens*; *Geijera parviflora*; *Hakea tephrosperma*; *Myoporum montanum*; *Senna* form taxon 'filifolia'; *Senna* form taxon 'artemisioides'; *Apophyllum anomalum*; *Calytrix tetragona*; *Parsonsia eucalyptophylla*; *Acacia decora*.

**Ground Cover:** *Einadia nutans* subsp. *nutans*; *Austrostipa scabra* subsp. *scabra*; *Austrodanthonia eriantha*; *Austrostipa verticillata*; *Chloris truncata*; *Aristida jerichoensis* var. *subspinulifera*; *Sclerolaena birchii*; *Atriplex spinibractea*; *Calotis cuneifolia*; *Sida corrugata*; *Oxalis chnoodes*; *Cheilanthes austrotenuifolia*; *Elymus scaber* var. *scaber*; *Enteropogon acicularis*; *Vittadinia dissecta* var. *dissecta*.

**Weed Species:** *Echium plantagineum*; *Sisymbrium irio*; *Pentascistis airoides*; *Aira caryophyllea*; *Arctotheca calendula*; *Cerastium glomeratum*; *Hypochaeris radicata*.

**Weediness:** Medium (5-15%) with <10% cover.

**Threatened Plants:** *Diuris tricolor*.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Woodland.

**Height Class (WH):** Mid-High; Tall.

**Vegetation Description:** Tall or mid-high woodland to about 18 m high dominated by White Cypress Pine (*Callitris glaucophylla*) that may occupy >90% of the canopy cover. The canopy structure alters depending on degree of clearing, thinning or regrowth. Various box

eucalypts may be present including Poplar Box (*Eucalyptus populnea*) and Western Grey Box (*Eucalyptus microcarpa*). Small trees may include Buloke (*Allocasuarina luehmannii*) or Belah (*Casuarina cristata*). Shrubs are sparse and include Deane's Wattle (*Acacia deanei* subsp. *deanei*), Wilga (*Geijera parviflora*), hopbush (*Dodonaea viscosa*), Maireana *enchylaenoides*, Thorny Saltbush (*Rhagodia spinescens*) and Senna spp. The ground cover is sparse dominated by grasses such as *Austrostipa scabra* subsp. *scabra*, *Enteropogon acicularis*, *Thyridolepis mitchellii*, *Austrodanthonia eriantha*, *Austrodanthonia setacea*, *Enteropogon acicularis* and *Eragrostis lacunaria*. Forb species include *Calotis cuneifolia*, *Sida cunninghamii*, *Oxalis perennans*, *Goodenia cycloptera*, *Xerochrysum bracteatum* and *Chrysocephalum apiculatum*. The rock fern *Cheilanthes sieberi* subsp. *sieberi* is often present. In dry times the ground may be nearly bare. Occurs on red, brown or yellow sandy or loamy soils on flats and rises on alluvial plains. Vegetation structure varies depending on the history of disturbance including logging. Dense regrowth of young Pines may be present. Distributed in central NSW, generally with annual rainfall between 400 and 600 mm. Mainly in the NSW South-western Slopes and Darling Riverine Plain Bioregions. A significant proportion of this community has been cleared as it occurs in the wheatbelt. Remnants occur in state forests, other public lands and on leasehold and private land. This community grades into Poplar Box or Western Grey Box woodlands in the mid-central and south and Poplar Box and Coolabah woodlands in the north that occur on finer texture soils. Grades into White Cypress Pine-Poplar Box community (ID72) in the Cobar Peneplain Bioregion.

**Level of Classification:** Alliance / Sub-formation.

**Classification Confidence Level:** Medium.

**Formation Group:** Cypress Pine (*Callitris*) Woodlands Mainly of the Inland.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Murrumbidgee - Tarcutta Source-bordering Dunes; .

**NVIS Major Veg Sub-Groups:** *Callitris* forests and woodlands.

**Forest Type (RN 17):** 193 - White Cypress Pine-Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes map unit P6 in Sivertsen & Metcalfe (1995), Metcalfe et al. (2003) and areas of P6 in Sivertsen & Metcalfe (2001). Part of White Cypress Pine map units N10, N10a, N10b in Peasley (2001) and Pine map unit in Peasley (2000) from the south-west corner of the Walgett Shire. Possibly communities F1 and F2 in Beeston et al. (1980). Possibly community C1.5 in Bos & Lockwood (1996). Part of BVT 15 in DEC (2006, 2006a). This community is dominated by White Cypress Pine and occurs on sandy-loam soil and is broadly classified here. Grades into a similar Pine-Box community (ID72) in the Cobar Peneplain and northern Murray-Darling Depression Bioregions.

**Interstate Equivalent(s):** None.

**Mapped/Modelled:** Current extent mapped.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mapped by Sivertsen & Metcalfe (1995) and Sivertsen & Metcalfe (2001) as map unit P6 excluding northern most occurrences. Southern locations on NSW south-western lower slopes documented in Bos & Lockwood (1996).

**Climate Zone:** Dry subtropical: moderately dry winter; Temperate: no dry season (hot summer); Semi-arid: hot (persistently dry).

**IBRA Bioregion (v6):** Brigalow Belt South (1-30%); Cobar Peneplain (1-30%); Darling Riverine Plains (1-30%); Murray-Darling Depression (1-30%); NSW South-western Slopes (30-70%).

**IBRA Sub-Region:** Bogan-Macquarie (1-30%); Castlereagh-Barwon (1-30%); Darling Depression (1-30%); Lower Slopes (30-70%); Nymagee (1-30%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%); North Western Plains (NWP) (1-30%); North Western Slopes (NWS) (1-30%); South Western Plains (SWP) (1-30%).

**Local Govt. Areas:** Bland (1-30%); Bogan (1-30%); Cabonne (1-30%); Cobar (1-30%); Dubbo (1-30%); Forbes (1-30%); Gilgandra (1-30%); Lachlan (1-30%); Narromine (1-30%); Parkes (1-30%); Warren (1-30%).

**CMAs:** Central West (30-70%); Lachlan (30-70%); Namoi (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium.

**Lithology:** Alluvial sand; Eolian sand or loam.

**Great Soil Group:** Red earth; Red-brown earth.

**Soil Texture:** Sandy clay loam; Sandy loam.

**Landform Patterns:** Peneplain; Plain.

**Landform Elements:** Footslope; Plain; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing; Timber Production.

**Impacts of European Settlement:** Major alteration of species composition; Medium reduction (30-70%) in extent and/or range; Younger age class over most of distribution.

**Pre-European Extent:** 200000 ha  $\pm$ 50%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate only.

**Current Extent:** 70000 ha  $\pm$ 50% or 35%  $\pm$  80% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). About 53000 mapped as P6 in Sivertsen & Metcalfe (1995) and Sivertsen & Metcalfe (2001) covering the NSW wheatbelt. Large areas have been cleared in Central Division.

**Conservation Reserves:** Strahorn FR 40 (E2).

**Reserves Total Area:** 40 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Strahorn Flora Reserve from Forestry Commission (1989a) which states pure Pine and a Western Grey Box - Pine woodland (ID82) are in the reserve.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 0.05% 40 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 1

**Protected Pre-European Extent:** 0.02% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** State forests in central western NSW (e.g. see Bos & Lockwood 1996) for example Backgamma SF. Some remnants on private or leasehold lands.

**Degree of Fragmentation:** Human induced fragmented stands with <60% >30% extent remaining and moderate edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Structure alters depending on logging and grazing history. Young tree regrowth may be present in areas that have been logged or cleared in the past. In other areas where grazing is severe, regrowth may be rare and trees may be senescing.

Occurs over a large geographical area in the central NSW and there is considerable variation in the associated species across its range.

**Fire Regime:** Unknown but now uncommon. Intense crown fire may kill Callitris.

**Adjoining Communities:** Grades into Western Grey Box woodland (ID76, ID82) on the southern plains. Grades into Poplar Box (ID244, ID105 or ID98) or Coolabah (ID40) woodland on central and northern plains and into Pine-Poplar Box (ID72) woodlands on in the Cobar Penplain.

**Threatening Processes:** Clearing for agriculture and logging has affected its abundance and structure particularly in the Central Division. The understorey has been affected by stock and feral animal grazing. Because this community occurs on sandy loam soils it has been cleared less than other wheatbelt communities that occur on finer texture soils. Considered to be Vulnerable due to current extent and lack of sampling in protected areas.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Forestry activities including logging; Soil erosion; Unsustainable grazing and trampling by stock; Unsustainable grazing by introduced animals; Weed (exotic) invasion; Woody shrub (native) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/5a

**Threat Criteria:** 4; 5; 1.

**Planning Controls:**

**Planning and Management:** Requires protection under catchment plans as the soils are erodible and careful management in state forests. Clearing in the Central Division, overlogging and continuous grazing are the main threats.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist and not required.

**Reference List:** (142; 177; 24; 210; 34; 46; 372; 373). Beeston, G.R., Walker, P.J., Purdie, R. & Pickard, J. (1980) Plant communities of the Poplar Box (*Eucalyptus populnea*) lands of eastern Australia. *Australian Rangelands* 2: 1-30; Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Forestry Commission of NSW (1989a) Forest preservation in state forests of New South Wales. Research Note No. 47. (Forestry Commission of NSW: Sydney); Peasley, B. (2001) Vegetation map of Moree Plains Shire. (Department of Land and Water Conservation: Inverell); 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; Sivertsen, D. & Metcalfe, L. (2001) Northern wheatbelt vegetation mapping. Unpublished 1:250 000 scale vegetation maps and vegetation descriptions covering northern NSW wheatbelt. (NSW National Parks and Wildlife Service: Hurstville); DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 74

**Common Name:** Yellow Box - River Red Gum tall grassy riverine woodland of NSW South West Slopes and Riverina Bioregions

**Scientific Name:** *Eucalyptus melliodora* - *Eucalyptus camaldulensis* / *Acacia deanei* subsp. *deanei* - *Acacia stenophylla* / *Monachather paradoxus* - *Elymus scaber* var. *scaber* - *Dichondra* sp. A - *Juncus filicaulis*

**Veg. Comm. ID.:** 74 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID74a\_img031pc.jpg *Eucalyptus melliodora*-*E.camaldulensis* woodland, Millewa State Forest, [AGD66 35°47'28.0"S 145°01'47.9"E], 10/4/02, Jaime Plaza.



**Photo 2:** ID74b\_img032pc.jpg *Eucalyptus melliodora*-*E.camaldulensis* woodland, Millewa State Forest, [AGD66 35°47'28.0"S 145°01'47.9"E], 10/4/02, Jaime Plaza.



**Photo 3:** ID74c\_img381ps.jpg *Eucalyptus melliodora* woodland with the exotic grass *Bromus diandrus* dominating the ground. Northern side of Lake Mulwala, approx.7 km east of Mulwala; 17/11/1987, Peter Smith.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Eucalyptus melliodora*; *Eucalyptus camaldulensis*; *Eucalyptus microcarpa*; *Eucalyptus populnea* subsp.

*bimbil*; *Allocasuarina luehmannii*; *Casuarina cristata*; *Callitris glaucophylla*.

**Shrubs/Vines/Epiphytes:** *Acacia deanei* subsp. *deanei*; *Acacia implexa*; *Acacia stenophylla*; *Muehlenbeckia florulenta*.

**Ground Cover:** *Monachather paradoxus*; *Panicum effusum*; *Austrostipa scabra* subsp. *scabra*; *Lachnagrostis filiformis*; *Glycine canescens*; *Juncus amabilis*; *Juncus subsecundus*; *Lomandra longifolia*; *Glossocardia bidens*; *Bothriochloa macra*; *Themeda australis*; *Desmodium varians*; *Hydrocotyle laxiflora*; *Aristida ramosa*; *Elymus scaber* var. *scaber*; *Oxalis perennans*; *Epilobium billardioreanum* subsp. *cinereum*; *Juncus filicaulis*; *Sporobolus creber*; *Solenogyne bellioides*; *Dichondra* sp. A; *Fimbristylis dichotoma*; *Enteropogon acicularis*; *Austrodanthonia caespitosa*; *Einadia nutans* subsp. *nutans*.

**Weed Species:** *Vulpia myuros*; *Echium plantagineum*; *Onopordum acanthium* subsp. *acanthium*; *Cirsium vulgare*; *Heliotropium europaeum*; *Lolium perenne*; *Lolium rigidum*; *Avena ludoviciana*; *Bromus catharticus*; *Bromus hordeaceus*; *Bromus diandrus*; *Trifolium arvense*; *Trifolium campestre*; *Trifolium glomeratum*; *Carthamus lanatus*; *Paspalum dilatatum*; *Petrorhagia nanteuilii*; *Aster subulatus*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** None recorded as of 2005.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 32±8 with 19 exotic spp. (community 35 in Smith & Smith 1990 in 20x20 m plots).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland usually about 20 m high dominated by Yellow Box (*Eucalyptus melliodora*) usually with River Red Gum (*Eucalyptus camaldulensis*) and sometimes with Buloke (*Allocasuarina luehmannii*). Other tree species may include White Cypress Pine (*Callitris glaucophylla*), Western Grey Box (*Eucalyptus microcarpa*) and Poplar Box (*Eucalyptus populnea* subsp. *bimbil*) in northern areas along the Lachlan River. Shrubs are very sparse or isolated and include wattles such as Deanes Wattle (*Acacia deanei* subsp. *deanei*), Hickory (*Acacia implexa*) and River Cooba (*Acacia stenophylla*). The ground cover often dominated by grasses and forbs and includes a large proportion of exotic species. Native grasses include *Monachather paradoxus*, *Austrodanthonia caespitosa*, *Panicum effusum*, *Austrostipa scabra* subsp. *scabra*, *Aristida ramosa*, *Elymus scaber* var. *scaber* and *Lachnagrostis filiformis*. Native forbs include *Epilobium billardioreanum* subsp. *cinereum*, *Glossocardia bidens*, *Hydrocotyle laxiflora*, *Solenogyne bellioides*, *Dichondra* sp. A and *Oxalis perennans*. Rushes include *Juncus amabilis*, *Juncus subsecundus* and *Juncus filicaulis*. Common weed species are *Cirsium vulgare*, *Heliotropium europaeum*, *Trifolium* spp., *Bromus* spp., *Lolium* spp. and *Carthamus lanatus*. Occurs on sandy-loam rises on terrace flats on the edge of floodplains of major river systems in south western NSW and in Victoria. Widely distributed but restricted in extent. Located from the western edge of the NSW South-western Slopes Bioregion to the eastern section of the Riverina Bioregion. Occurs along the Murray River to west of the Cadell Fault near Deniliquin. Much of its extent has been cleared for crops and grazing. Remnants often contain aging trees and there is a lack of tree regeneration as the ground cover has been grazed and it is often heavily infested with weeds. A threatened plant community that is very poorly represented in protected areas as of 2005.

**Level of Classification:** Association.

**Classification Confidence Level:** High.

**Formation Group:** *Eucalyptus* Communities of Inland Watercourses and Inner Floodplains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 200 - River Red Gum-Black Box/Coolabah (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes community 35 in Smith & Smith (1990) on the Murray River floodplain. Map unit R6 in Sivertsen & Metcalfe (1995) for southern wheatbelt. Mentioned in the Mid-Lachlan draft RVMP (Mid-Lachlan RVC 1999). Probably part of Biolandscapes SouA75 and SouC75 in Friday (2006). Includes community 3 in Austin et al. (2000) for central Lachlan region. Part of vegetation community 9 in the draft Western Riverina RVMP (WRRVC 2001). Includes Floristic Group 17 being part of map unit FPL1 in Lewer et al. (2003). Part of BVT 70 in DEC (2006a). This community also probably extends into northern Victoria. This community mainly occurs on the NSW South Western Slopes and Riverina Bioregions. Similar to ID83 in the Darling Riverine Plain Bioregion to the north. Often adjoins riverine Western Grey Box woodland (ID237) along rivers.

**Interstate Equivalent(s):** Victoria: similar to EVC803 Plains Woodland or EVC 67 Alluvial Terrace Herb-rich Woodland.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mappable from aerial photos with ground checking but difficult to distinguish from Western Grey Box. Mapped for northern section of southern wheatbelt by Sivertsen & Metcalfe (1995) and as part of Mixed Box Woodland along the Murray River (MDBC & Smith & Smith 1990). Small part of map unit FLP1 in Lewer et al. (2003) along the Lachlan River. Localised mapping in state forests, reserves and along roads.

**Climate Zone:** Temperate: no dry season (hot summer); Semi-arid: warm (winter rain).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); Riverina (30-70%).

**IBRA Sub-Region:** Lower Slopes (30-70%); Murray Fans (1-30%).

**Botanical Division:** South Western Plains (SWP) (30-70%); South Western Slopes (SWS) (30-70%).

**Local Govt. Areas:** Albury (1-30%); Berrigan (1-30%); Bland (1-30%); Coolamon (1-30%); Corowa (1-30%); Deniliquin (1-30%); Forbes (1-30%); Greater Hume (1-30%); Lachlan (1-30%); Lockhart (1-30%); Narrandera (1-30%); Parkes (1-30%); Wagga Wagga (1-30%); Weddin (1-30%); Young (1-30%).

**CMAs:** Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium; Eolian sediment.

**Lithology:** Alluvial loams and clays.

**Great Soil Group:** Alluvial soil; Black earth; Grey clay.

**Soil Texture:** Clay loam; Clay loam, sandy; Light clay; Loam; Silty clay loam; Silty loam.

**Landform Patterns:** Flood plain; Meander plain.

**Landform Elements:** Plain; Terrace flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Dieback due to disease or senescence; Major alteration of species composition; Major reduction (>70%) in extent and/or range; Older age class over most of distribution.

**Pre-European Extent:** 30000 ha ±30%. Estimated from extant vegetation maps part range.

**Pre-European Extent Comments:** Estimate based on general reduction of box woodlands in this part of NSW. This community would have



occurred as patches on river flats over a large distribution of the southern wheatbelt of NSW and on flats adjoining large rivers of the eastern Riverina Bioregion.

**Current Extent:** 8000 ha  $\pm$ 30% or 27%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). 2150 ha mapped by Sivertsen & Metcalfe (1995) for the Forbes-Cargellico region. Probably about half of the approximately 6000 ha mapped along Murray River as Mixed Box Woodland in Margules & Partners (1990). It is part of the broad map unit FLP1 in Lewer et al. (2003) along the Lachlan River. It is known from the Murray River to just west of Deniliquin. It is considered that little remains compared to pre-European extent because it occurs on fertile floodplain soils that have mainly been cleared. Austin et al. (2000) predict that 2600 ha (10%) remains of pre-European extent in the central Lachlan region.

**Conservation Reserves:** Narrandera NR 8 (E2); Sanddune Pine FR 3 (E3); Toupna Creek FR 13 (E3).

**Reserves Total Area:** 24 ha.

**No. Representatives in Reserves:** 3

**Protected Area Explanation:** Areas in Toupna Creek Flora Reserve and Sanddune Pine Flora Reserve based on notes in Forestry Commission (1989a). Estimate from Narrandera Nature Reserve from Benson (1999-2009). PA DE9906 from overlaying Roberts & Roberts (2001).

**Secure Property Agreements:** DE9906 PA 3 (M).

**Secure PAs Total Area:** 3 ha.

**No. Representatives in Secure Property Agreements:** 1

**Protected Current Extent:** 0.33% 27 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 4

**Protected Pre-European Extent:** 0.09% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Requires a targeted survey over full range. Northern additions to Narrandera Nature Reserve. Sites along the Murray, Murrumbidgee and Lachlan Rivers and their tributaries. Stands of mature woodland near Mulwala, west of Corowa, may be worth investigating for protection under a property agreement.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Occasionally flooded and ground cover varies depending on flooding regime. A kind of ecotonal community between true River Red Gum forest and outer plains box woodlands.

**Fire Regime:** Unknown. Rare today. During pre-European times this community was possibly subjected to patch burns by Aborigines but few fires occur now due to fragmentation.

**Adjoining Communities:** May adjoin Riverine Western Grey Box woodland (ID237) on silty-clay soil along inland rivers. Grades into various River Red Gum forests on lower parts of the floodplain that are subject to more frequent flooding.

**Threatening Processes:** Further clearing of remnants, dieback of old trees, lack of regeneration of trees, weed domination of the ground cover, fertilizers, continuous heavy grazing and in some locations salinity.

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Dryland cropping; Irrigated cropping (incl. horticulture); Chemical pollution (incl. herbicides, pesticides); Nutrient changes through fertilizers or runoff; Hydrology (drainage); Forestry activities including logging; Salinity; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4; 5.

**Planning Controls:**

**Planning and Management:** May be protected from clearing under the Murray Valley Regional Environmental Plan but not protected to the north. Protected in some state forests along the Murray River. Requires active restoration management including fencing off areas. Requires more detailed survey to identify key sites. Remaining areas should be protected under appropriate catchment plans and selected sites under secure property agreements.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (183; 308; 24; 293; 11; 67; 34; 9; 146; 356; 373). Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeoglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Forestry Commission of NSW (1989a) Forest preservation in state forests of New South Wales. Research Note No. 47. (Forestry Commission of NSW: Sydney); Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. & Ryan, C. (2003) Native vegetation map report Bogan Gate, Boona Mount, Condobolin, Dandaloo, Tottenham and Tullamore 1:100 000 map sheets. (NSW Department of Infrastructure, Planning and Natural Resources). Submitted to Cunninghamia; Margules & Partners (1990) River Murray Riparian Vegetation Study. (Murray-Darling Basin Commission: Canberra); Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Sivertsen, D. & Metcalfe, L. (1995) Natural vegetation of the southern wheat-belt (Forbes and Cargellico 1:250 000 map sheets). Cunninghamia 4(1): 103-128; Smith, P. & Smith J. Ecological Consultants (1990) Floristic Communities. In River Murray Riparian Vegetation Study. (Murray-Darling Basin Commission: Canberra); Western Riverina Regional Vegetation Committee (2001) Draft Western Riverina Regional Vegetation Management Plan. (Western Riverina RVC: Deniliquin); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 76

**Common Name:** Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

**Scientific Name:** *Eucalyptus microcarpa* / *Dodonaea viscosa* subsp. *cuneata* - *Acacia buxifolia* subsp. *buxifolia* / *Austrodanthonia caespitosa* - *Austrostipa scabra* subsp. *falcata* - *Chloris truncata* - *Sida corrugata*

**Veg. Comm. ID.:** 76 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID76a\_PC248-9.jpg *Eucalyptus microcarpa* - *Callitris glaucophylla* tall woodland, Parkes to Wellington Road near Hervey Range, [AGD66 32°59'47"S 148°21'19"E], 04/05/2005, Jaime Plaza.



**Photo 2:** ID76b\_benson.jpg *Eucalyptus microcarpa* tall woodland grazed in drought, Morangarell Road near Narraburra north of Temora [AGD66 34°15.568'S 147°47.251'E], 14/2/2007, J.S. Benson.



**Photo 3:** ID76c\_img295pc.jpg *Eucalyptus microcarpa* grassy tall woodland on loamy clay, Bimbi Road TSR South of Grenfell, [AGD66 34°01'09"S 147°50'13"E], 12/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Qualitative Estimate)

**Trees:** *Eucalyptus microcarpa*; *Eucalyptus melliodora*; *Callitris glaucophylla*; *Allocasuarina luehmannii*.

**Shrubs/Vines/Epiphytes:** *Dodonaea viscosa* subsp. *cuneata*; *Acacia buxifolia* subsp. *buxifolia*; *Bursaria spinosa* subsp. *spinosa*; *Acacia oswaldii*; *Acacia pycnantha*; *Acacia hakeoides*; *Acacia brachybotrya*; *Santalum acuminatum*; *Acacia homalophylla*; *Templetonia stenophylla*; *Exocarpos aphyllus*.

**Ground Cover:** *Austrodanthonia caespitosa*; *Chloris truncata*; *Sida corrugata*; *Austrostipa scabra* subsp. *falcata*; *Wahlenbergia gracilis*; *Einadia nutans* subsp. *nutans*; *Paspalidium constrictum*; *Themeda australis*; *Austrostipa aristiglumis*; *Aristida behriana*; *Elymus scaber* var. *scaber*; *Austrodanthonia setacea*; *Carex inversa*; *Poa sieberiana*; *Vittadinia gracilis*; *Dianella porracea*; *Salsola tragus* subsp. *tragus*; *Oxalis perennans*; *Atriplex semibaccata*; *Chamaesyce drummondii*; *Lomandra filiformis* subsp. *coriacea*; *Asperula conferta*; *Convolvulus erubescens*; *Rhodanthe corymbiflora*; *Austrostipa bigeniculata*; *Enchylaena tomentosa*; *Leiocarpa panaetioides*; *Podolepis jaceoides*; *Atriplex semibaccata*.

**Weed Species:** *Heliotropium europaeum*; *Echium plantagineum*; *Medicago minima*; *Vulpia myuros*; *Schinus areira*; *Medicago polymorpha*; *Arctotheca calendula*; *Cerastium glomeratum*; *Avena barbata*; *Hordeum leporinum*; *Cirsium vulgare*; *Bromus diandrus*; *Lepidium africanum*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Woodland.

**Height Class (WH):** Tall; Very Tall.

**Vegetation Description:** Tall woodland to 25 m high dominated by Western Grey Box (*Eucalyptus microcarpa*) often as the only tree species often occupying 90% of the canopy cover but other trees may include Yellow Box (*Eucalyptus melliodora*), White Cypress Pine (*Callitris glaucophylla*) and minor Buloke. The shrub layer is absent or sparse and includes *Dodonaea viscosa* subsp. *cuneata*, *Acacia buxifolia*, *Acacia acinacea*, *Acacia hakeoides*, *Bursaria spinosa*. Grazing has eliminated shrubs these in many places. A mid-dense or dense grass ground cover is present composed of *Austrodanthonia caespitosa*, *Austrodanthonia setacea*, *Austrostipa scabra* subsp. *falcata*, *Paspalidium constrictum*, *Themeda australis*, *Austrostipa aristiglumis*, *Aristida behriana* and *Elymus scaber* var. *scaber* along with introduced grass species such as *Bromus* spp., *Vulpia* spp. and *Hordeum leporinum*. The small scrambler *Einadia nutans* subsp. *nutans* is usually present. Native forbs include *Sida corrugata*, *Wahlenbergia gracilis*, *Vittadinia gracilis*, *Dianella porracea*, *Oxalis perennans* and *Chamaesyce drummondii*. Occurs on texture contrast red or brown earths or grey clay soils (that may be gilgaid) on undulating alluvial plains in the predominantly winter rainfall belt of south-central western NSW with an average annual rainfall between 550 and 450 mm. Mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Distributed from north of Forbes in the north to near Albury in the south extending into north-central Victoria. It has lost its original shrub layer in many locations where grazing has been intense. Grades into the more shrubby Western Grey Box-White Cypress Pine - Buloke community (ID80) on loamy-sand soils and grades into White Box (*Eucalyptus albens*) on podzolic soils to the east on the western slopes. Grades into a riverine Western Grey Box community ID237 along the floodplains of the Murrumbidgee and Murray Rivers. Due to its occurrence on arable soils, this community has largely been cleared. Much of its remaining extent is threatened by grazing and weed invasion. It is a critically endangered community.

**Level of Classification:** Alliance / Sub-formation.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Inland Plains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 174 - White Box-Western boxes (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). A broadly classified community where Western Grey Box is a very dominant canopy species on clay to loam soils. Beadle (1981) separates Western Grey Box communities from the north to the south based on rainfall regimes. Moore (1953a) lists four associations of "Eucalyptus woollsiana" woodland on south-western NSW. This community equates to his "Eucalyptus woollsiana association" on red-earth and clay soils. Part of the broad Grassy Box Woodland map unit in Miles (2001) for the Murray Catchment. Includes community C3.1 in Bos & Lockwood (1996) is grouped under major vegetation unit 9 in Draft Western Riverina RVM Plan (WRRVC 2001). May include a small part of community 24 mapped in Porteners (1993) on the southern Hay Plain, equivalent to part of Western Grey Box community in the Mid-Lachlan area (Mid-Lachlan RVC 1999), probably includes community 12 in Austin et al. (2000) for central Lachlan area. May overlap with part of map units P3 and P4 in Sivertsen & Metcalfe (1995). It is equivalent to plant associations 2.4.1 (*Eucalyptus microcarpa*) and 2.4.2 in Brickhill (1984). Includes Biolandscapes SouA25e and part of Biolandscapes SouA255a, SouA25c, SouA25d and UlaV25a in Priday (2006). modelled and surveyed in Priday (2004) for Wagga Wagga region. Recorded along roadsides in the Corowa Shire (Mulham 1994). Some similarities to the shrubbier Western Grey Box woodland (ID80) that occurs on sandier soils over a similar distribution and the riverine Western Grey Box woodland (ID237) that occurs along rivers.

**Interstate Equivalent(s):** Victoria: similar to Floristic Community 55-06 in EVC803 Plains Woodland..

**Mapped/Modelled:** Current extent and pre-European extent mapped or modelled as part of a broader complex. **Sampling:** Inadequate.

**Mapping Info:** Mappable with field survey or soils mapping. Mapped as part of broad unit by Moore (1953a). Mapped as part of a broad Western Grey Box community by Porteners (1993). Modelled for Wagga Wagga Shire by Priday (2004).

**Climate Zone:** Temperate: no dry season (hot summer); Semi-arid: warm (winter rain).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); Riverina (1-30%).

**IBRA Sub-Region:** Lower Slopes (30-70%); Murray Fans (1-30%); Murrumbidgee (1-30%).

**Botanical Division:** South Western Plains (SWP) (30-70%); South Western Slopes (SWS) (1-30%).

**Local Govt. Areas:** Berrigan (1-30%); Conargo (1-30%); Coolamon (1-30%); Corowa (1-30%); Griffith (1-30%); Jerilderie (1-30%); Juneee (1-30%); Lachlan (1-30%); Leeton (1-30%); Lockhart (1-30%); Murray (1-30%); Temora (1-30%); Urana (1-30%); Wagga Wagga (1-30%); Greater Hume (1-30%).

**CMAs:** Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.



**Substrate Mass:** Alluvium.

**Lithology:** Alluvial loams and clays; Shale.

**Great Soil Group:** Grey clay; Red clay; Red-brown earth.

**Soil Texture:** Clay loam; Clay loam, sandy; Loam.

**Landform Patterns:** Alluvial plain; Flood plain.

**Landform Elements:** Levee; Plain; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range; Older age class over most of distribution.

**Pre-European Extent:** 500000 ha ±30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** An extensive community on the South Western Plains and western part of the South Western Slopes Botanical Divisions. Over 500000 ha Western Grey Box probably was modelled as existing prior to European settlement in the Western Riverina area (WRRVC 2001) but this covers several communities. Only small remnants remain and most of these have been heavily altered by grazing by stock and rabbits. Austin et al. (2000) model a pre-European extent of 155,200 ha for the central Lachlan region.

**Current Extent:** 40000 ha ±30% or 8% ± 60% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). The Western Riverina draft RVM Plan pre-European mapping indicates only 2.7% of its broad Western Grey Box type remains (14700 ha from an original 544500 ha) for that planning region. Miles (2001) indicates 8% of a grassy box woodland type remains in the Murray Catchment but this includes a number of box woodland communities. This community has been mainly cleared throughout its range. Austin et al. (2000) predict that only 3% (4600 ha) remain in the central Lachlan region.

**Conservation Reserves:** Flagstaff Memorial NR 10 (E2); Wiesners Swamp NR 20 (E1).

**Reserves Total Area:** 30 ha.

**No. Representatives in Reserves:** 2

**Protected Area Explanation:** Noted in Wiesners Swamp NR by Benson (1999-2009) and NSW NPWS (2001c) but the original shrub layer has been grazed out. Flagstaff Memorial NR from Brickhill (1978a). VCA038 estimate from the vegetation map in Moore (1953a). VCA108 from NSW NPWS files. PA AL9913 from DIPNR PANet database notes. PAs HE9901, NA9904 and WW0001 estimates from DNR database and coarse map in Moore (1952).

**Secure Property Agreements:** AL9913 PA 8 (E1); HE9901 PA 33 (E2); NA9904 PA 38 (E2); VCA108 Stockinbingal Cemetery VCA 4 (M); WW0001 PA 97 (E2).

**Secure PAs Total Area:** 180 ha.

**No. Representatives in Secure Property Agreements:** 5

**Protected Current Extent:** 0.52% 210 ha ± 30%.

**No. Representatives in Protected Areas:** 7

**Protected Pre-European Extent:** 0.04% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** This community is very poorly reserved. Greening Australia have fenced off some private land remnants of Western Grey Box in the Murray catchment. Some of the best sites are on Travelling Stock Reserves and roadsides, for examples see Mulham (1994), Friday (2004) and Friday (2006). Excellent stands with intact ground cover occur along Shoards Crossing Lane TSR, west of Young.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Varies with soil type and drainage. Areas on heavier clays contain less shrubs and a rich forb/grass cover. Areas on lighter loam soils may contain White Cypress Pine and Yellow Box. Little is known about natural succession due to gross changes of understorey due to weed invasion. Fire may have played a significant role in grass/shrub dynamics.

**Fire Regime:** Unknown, highly fragmented so most patches are rarely burnt.

**Adjoining Communities:** Grades into Western Grey Box-White Cypress Pine-Buloke (ID80) on sandier soils and into White Box (*Eucalyptus albens*) (ID266) on texture contrast soils to the east. Grades into Poplar Box (*Eucalyptus populnea* subsp. *bimbill*) woodlands to the northwest. Grades into Grey Box - *Callitris endlicheri* (Black Cypress Pine) - *Eucalyptus sideroxylon* community (ID110) upslope on rocky outcrops southern-central NSW. Grades into ID237 a riverine form of Western Grey Box along the Murray and Murrumbidgee Rivers and into River Red Gum - Blakely's Red Gum riparian woodland on the western slopes (ID79).

**Threatening Processes:** Mainly cleared in the past for grazing and crops. The shrub understorey of remnants has been largely eliminated by grazing by stock and rabbits. Annual weeds invade the ground cover including *Heliotropium europaeum*. Salinity is likely to increasingly affect some areas in the Riverina.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Irrigated cropping (incl. horticulture); Salinity; Unsustainable grazing and trampling by stock; Unsustainable grazing by introduced animals; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 1; 4; 5.

**Planning Controls:** Other

**Planning and Management:** Requires detailed survey and protection of what remains under Murray, Murrumbidgee and Lachlan Catchment Management Plans. May be protected in the Murray Catchment under the Murray Valley Regional Environmental Plan. Should be listed as an endangered ecological community.

**Listed Under Legislation:** Listed TSC Act, E: Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act, E: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (183; 3; 308; 177; 301; 67; 246; 166; 178; 154; 323; 153; 14; 316; 34; 146; 356). Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Beadle, N.C.W. (1981) The vegetation of Australia. (Cambridge University Press: Cambridge); Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Brickhill, J. (1978a) Information sheet on Flagstaff Memorial Nature Reserve. RN 39. (NSW National Parks and Wildlife Service: Griffith); Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Miles, C. (2001) NSW Murray Catchment: biodiversity action plan. (Nature Conservation Working Group Inc.: Albury); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Mulham, W.E. (1994) Roadside vegetation: survey and management guidelines Corowa Shire. (Central Murray Roadside Vegetation Management Group: Deniliquin); Norris, E.H. & Thomas, J. (1991) Vegetation on rocky outcrops and ranges

in central and south-western New South Wales. *Cunninghamia* 2(3): 411-442; NSW National Parks and Wildlife Service (2001c) Wiesners Swamp Nature Reserve. Draft Plan of Management. (NSW National Parks and Wildlife Service: Hurstville); NSW National Parks and Wildlife Service (undated a) The Rock Nature Reserve information leaflet. File note RN 38. (NSW National Parks and Wildlife Service: Griffith); Porteners, M.F. (1993) The natural vegetation of the Hay Plain: Booligal-Hay and Deniliquin-Bendigo 1:250 000 maps. *Cunninghamia* 3(1) 1-122; Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); 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; Western Riverina Regional Vegetation Committee (2001) Draft Western Riverina Regional Vegetation Management Plan. (Western Riverina RVC: Deniliquin); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan.

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 80

**Common Name:** Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South-western Slopes and Riverina Bioregions

**Scientific Name:** *Eucalyptus microcarpa* - *Callitris glaucophylla* - *Allocasuarina luehmannii* / *Maireana microphylla* - *Acacia deanei* subsp. *deanei* / *Austrostipa scabra* subsp. *scabra* - *Austrodanthonia setacea* - *Calotis cuneifolia*

**Veg. Comm. ID.:** 80 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID80a\_PC247-12.jpg *Eucalyptus microcarpa* - *Callitris glaucophylla* woodland, Backyamma State Forest, [AGD66 33°19'28.3"S 148°12'56.2"E], 03/05/2005, Jaime Plaza.



**Photo 2:** ID80b\_SWS0507342.jpg Western Grey Box (*Eucalyptus microcarpa*) with (*Callitris glaucophylla*) and Buloke (*Allocasuarina luehmannii*) in Clear Ridge State Forest north of Wyalong, [AGD66 33°45.220'S 147°18.992'E], 31/5/2007, Jaime Plaza.



**Photo 3:** ID80c\_img009pc.jpg *Eucalyptus microcarpa* - *Callitris glaucophylla* woodland, Buckingbong Flora Reserve, [AGD66 34°59'12.9"S 146°28'59.4"E], 9/4/02, Jaime Plaza.





**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus microcarpa*; *Callitris glaucophylla*; *Eucalyptus melliodora*; *Allocasuarina luehmannii*; *Pittosporum angustifolium*; *Brachychiton populneus* subsp. *populneus*; *Eucalyptus blakelyi*.

**Shrubs/Vines/Epiphytes:** *Maireana microphylla*; *Acacia deanei* subsp. *deanei*; *Dodonaea viscosa* subsp. *cuneata*; *Acacia hakeoides*; *Myoporum desertii*; *Senna artemisioides*; *Hakea leucoptera* subsp. *leucoptera*; *Alectryon oleifolius* subsp. *canescens*; *Geijera parviflora*; *Acacia oswaldii*; *Acacia salicina*; *Exocarpos aphyllus*; *Cassinia adunca*; *Cassinia laevis*; *Acacia brachybotrya*; *Acacia verniciflua*; *Acacia buxifolia* subsp. *buxifolia*; *Solanum ferocissimum*; *Jasminum lineare*.

**Ground Cover:** *Austrostipa scabra* subsp. *falcata*; *Austrodanthonia setacea*; *Calotis cuneifolia*; *Sida corrugata*; *Enteropogon acicularis*; *Austrodanthonia fulva*; *Maireana enchylaenoides*; *Stuartina muelleri*; *Austrodanthonia caespitosa*; *Oxalis perennans*; *Calotis lappulacea*; *Crassula sieberiana* subsp. *sieberiana*; *Vittadinia gracilis*; *Daucus glochidiatus*; *Cheilanthes sieberi* subsp. *sieberi*; *Chrysocephalum apiculatum*; *Einadia nutans* subsp. *nutans*; *Eremophila debilis*; *Lomandra filiformis* subsp. *filiformis*; *Carex inversa*; *Dichondra* sp. A; *Arthropodium minus*; *Rumex brownii*; *Goodenia pinnatifida*; *Wurmbea dioica* subsp. *dioica*; *Elymus scaber* var. *scaber*; *Aristida behriana*; *Aristida ramosa*; *Eragrostis lacunaria*; *Glycine tabacina*; *Vittadinia pterochaeta*; *Wahlenbergia communis*; *Hydrocotyle laxiflora*; *Bulbine semibarbata*; *Bulbine bulbosa*; *Plantago debilis*; *Tricoryne elatior*.

**Weed Species:** *Echium plantagineum*; *Hypochaeris glabra*; *Trifolium campestre*; *Trifolium arvense*; *Trifolium glomeratum*; *Lolium rigidum*; *Petrorhagia nanteuillii*; *Medicago minima*; *Medicago polymorpha*; *Sonchus oleraceus*; *Lycium ferocissimum*; *Vulpia myuros*; *Arctotheca calendula*; *Carthamus lanatus*; *Marrubium vulgare*; *Sisymbrium orientale*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** *Diuris tricolor* (Vulnerable, TSC Act); *Prasophyllum campestre*.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 50±3 (floristic group 12 in Lewer et al. 2002 in 20x20 m plots); 44±2 (floristic group 38 in Lewer et al. 2002 in 20x20 m plots)..

**Rainforest Structure (Webb):** Not assessed.

**Structure (WH):** Woodland; Open Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland up to 25 m high but averaging about 20m co-dominated by Western Grey Box (*Eucalyptus microcarpa*) and White Cypress Pine (*Callitris glaucophylla*) with the pine tending to be shorter than the eucalypts. Other trees may include Yellow Box (*Eucalyptus melliodora*), Buloke (*Allocasuarina luehmannii*), *Pittosporum angustifolium* and Kurrajong (*Brachychiton populneus*). A sparse layer of shrubs is may be present however they may be absent where grazing has been intense or the understorey has been cleared. Tall shrub species may include Wilga (*Geijera parviflora*), *Eremophila deserti*, Quandong (*Santalum acuminatum*) and wattles such as *Acacia deanei* subsp. *deanei*, *Acacia hakeoides*, *Acacia brachybotrya* and *Acacia buxifolia*. The low shrub *Maireana microphylla* is often the most common shrub present when tall shrubs have been eliminated. A sparse to mid-dense ground cover includes short shrubs such as *Einadia nutans* subsp. *nutans* and *Eremophila debilis* with grass species such as *Austrostipa scabra* subsp. *scabra*, *Austrodanthonia setacea*, *Austrodanthonia fulva*, *Elymus scaber* subsp. *scaber*, *Enteropogon acicularis* and *Aristida ramosa*. Forb species include *Calotis cuneifolia*, *Sida corrugata*, *Dichondra* sp. A, *Daucus glochidiatus*, *Oxalis perennans*, *Arthropodium minus*, *Bulbine* spp. and *Goodenia pinnatifida*. The rock fern *Cheilanthes sieberi* subsp. *sieberi* is common along with the graminoid *Lomandra filiformis*. Occurs on sandy-loam to clay-loam soils on alluvial or stagnant alluvial plains in the predominantly winter rainfall belt of southern-central NSW with an average annual rainfall of between 400 to 550 mm. Mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Most of this community has been cleared for grazing or crops but some sizable patches remain in state forests that have been managed for White Cypress Pine. Much of its remaining extent is threatened by grazing and weed invasion. Grades into Yellow Box - Pine community (ID75) on sandier soils e.g. from Narrandera to Urana. This community is endangered and very poorly conserved as of 2007.

**Level of Classification:** Association.

**Classification Confidence Level:** High.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Inland Plains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a shrubby understorey.

**Forest Type (RN 17):** 203 - Western Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes the "Eucalyptus woollsiana - Callitris glauca" association described on page 508 of Moore (1953a). It is the most widespread of the Western Grey Box associations ranging from near Dubbo to near the Murray River. Includes most of floristic group 12 being part of map units PNP2 and PNP3 and floristic group 38 being map unit ALP5 in Lewer et al. (2003). Includes community C3.2 and probably C3.3 in Bos & Lockwood (1996). Mapped for Murray Region as part of broad Western Grey Box type (Miles 2001) and comprises much of the mapped Western Grey Box in Western Riverina Regional Vegetation Community descriptions (2001). Part of map unit 24 in Porteners (1993). Some of the broad woodland types in map units P4 and P7 in Sivertsen & Metcalfe (1995) and mentioned as an association in Mid-Lachlan Regional Vegetation Committee (1999). Probably community 6 in (Friday 2004) for western Wagga Shire and part of Biolandscapes LacM25b, EasR25d and SouA25a in Friday (2006). Similar to community D9 in Seddon et al. (2002) for Little River. Part of BVT 74 in DEC (2006, 2006a). Eastern limit near Grenfell on the NSW SW Slopes (J Benson pers. obs). May be similar to the Western Grey Box - Buloke community described as community 10 in Sluiter et al. (1997) in Victoria and along the Murray in NSW. Part of BVT 20 in DEC (2006a).

**Interstate Equivalent(s):** Victoria: similar to Floristic Community 55-06 in EVC803 Plains Woodland.

**Mapped/Modelled:** Current extent and pre-European extent mapped or modelled as part of a broader ~~complex~~ **complex**: Inadequate.

**Mapping Info:** Moore (1953a) mapped this association as part of a broad Western Grey Box complex as does the Murray Catchment Trust (2001) for the Murray Catchment. Sivertsen & Metcalfe (1995) grouped this into a broader box woodland type. Some northern areas classified as floristic group 12 and mapped in map units ALP5, PNP2 and PNP3 in Lewer et al. (2003). Needs more plot sampling in southern areas as of 2007.

**Climate Zone:** Temperate: no dry season (hot summer); Semi-arid: warm (winter rain).

**IBRA Bioregion (v6):** NSW South-western Slopes (1-30%); Riverina (30-70%).

**IBRA Sub-Region:** Lachlan (1-30%); Lower Slopes (30-70%); Murray Fans (1-30%); Murrumbidgee (1-30%); Upper Slopes (1-30%).

**Botanical Division:** Central Western Slopes (CWS) (1-30%); South Western Plains (SWP) (30-70%); South Western Slopes (SWS) (1-30%).

**Local Govt. Areas:** Bland (1-30%); Cabonne (1-30%); Conargo (1-30%); Coolamon (1-30%); Greater Hume (1-30%); Forbes (1-30%); Griffith (1-30%); Jerilderie (1-30%); Lachlan (1-30%); Leeton (1-30%); Lockhart (1-30%); Murrumbidgee (1-30%); Narrandera (1-30%); Parkes (1-30%); Urana (1-30%); Wellington (1-30%).

**CMAs:** Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium; Colluvium; Plutonic rocks.

**Lithology:** Alluvial loams and clays; Alluvial sand; Eolian sand or loam; Granite; Sandstone.

**Great Soil Group:** Grey-brown podzolic soil; Red-brown earth.

**Soil Texture:** Clay loam, sandy; Sandy clay loam.

**Landform Patterns:** Alluvial plain; Stagnant alluvial plain.

**Landform Elements:** Plain.

**Land Use:** Cropping and Horticulture; Grazing; Timber Production.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 800000 ha  $\pm$ 30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate based on half of the broad Western Grey Box alliance mapped by Moore (1953a) and areas mapped by White (2002) for the Western Riverina region.

**Current Extent:** 140000 ha  $\pm$ 30% or 18%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). The Western Riverina draft RVM Plan pre-European mapping indicates only 2.7% of its broad Western Grey Box type remains (14700 ha from an original 544500 ha) for that planning region. Seddon et al.(2002) estimate only 2% remains in the Little River catchment at its northern range. Assume to be half of map unit PNP3 and one third of PNP2 i.e. 36000 ha with an additional 2550 ha for map unit ALP5 in Lewer et al. (2003).

**Conservation Reserves:** Buckingham FR 155 (M); Gubbata NR 5 (E1); Wilbertray FR 22 (E1).

**Reserves Total Area:** 182 ha.

**No. Representatives in Reserves:** 3

**Protected Area Explanation:** Area in Gubbata NR - from NSW NPWS (1987). Wilbertray Flora Reserve estimate from notes in Forestry Commission (1989a) and forest type map of reserve. Buckingham Flora Reserve from Forestry Commission (1989a) and checked there by Benson (1999-2009). PAs AL9907, AL9908, AL9909, AL9910 from DIPNR PA database - some areas in these PAs may be cleared. AL9921 from DIPNR GIS file excluding 44 ha that is cleared in this PA area.

**Secure Property Agreements:** AL9907 PA 14 (E1); AL9908 PA 17 (E1); AL9909 PA 30 (M); AL9910 PA 134 (M); AL9921 PA 19 (E1).

**Secure PAs Total Area:** 214 ha.

**No. Representatives in Secure Property Agreements:** 5

**Protected Current Extent:** 0.28% 396 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 8

**Protected Pre-European Extent:** 0.04% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** State Forests such as Wahgunyah, Buckingham, Matong and Yarranjerry (see Bos & Lockwood 1996). However, most state forests have been "timber stand improved" to reduce eucalypts in favour of cypress pine. TSRs throughout range. Occurs between Boginderra and Temora on SW slopes.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Mostly fragmented into small stands. This community probably contained a mid-dense layer of shrubs that in most areas have been grazed out.

**Fire Regime:** Unknown - occasional wildfire sweeps through the region but most remnants are now so isolated that they rarely burn. The original fire regime may have been 10-40 years but fragmentation would modify how one would burn it today.

**Adjoining Communities:** Grades into ID110 on colluvial soils in hilly country on the NSW South Western Slopes. Grades into Yellow Box - Pine (ID75) near Urana, into grassy Western Grey Box (ID76) on clay-loam soils, into Myall (*Acacia pendula*) open woodland on heavier alluvial soils (ID26). Grades into ID70 Callitris Pine woodland on sandier soil in the wheatbelt.

**Threatening Processes:** Further clearing for crops, weed invasion, silviculture in state forests, salinity affecting some areas.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Forestry activities including logging; Salinity; Unsustainable grazing and trampling by stock; Weed (exotic) invasion; Woody shrub (native) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4; 5.

**Planning Controls:**

**Planning and Management:** Clearing of this community should cease under Mid-Western, Lachlan, Murrumbidgee and Murray Catchment Management Plans. Some areas require reservation and others protection under property agreements. Fence patches in good or reasonable condition on private land.

**Listed Under Legislation:** Listed TSC Act, E: Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act, E: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (308; 177; 177; 152; 149; 24; 293; 167; 67; 165; 166; 14; 316; 34; 21; 146; 285; 276; 356; 372; 373; 373). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Fleetwood, R. (1987b) The Charcoal Tank NR vegetation abundance and distribution ratings. File note RN 58. (NSW National Parks and Wildlife Service: Griffith); Fleetwood, R. (1987d) Abundance and distribution ratings of vegetation in Gubbata Nature Reserve. Unpublished file note RN 60. (NSW National Parks and Wildlife Service: Griffith); Forestry Commission of NSW (1989a) Forest preservation in state forests of New South Wales. Research Note No. 47. (Forestry Commission of NSW: Sydney); Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. & Ryan, C. (2003) Native vegetation map report Bogan Gate, Boona Mount, Condobolin, Dandaloo, Tottenham and Tullamore 1:100 000 map sheets. (NSW Department of Infrastructure, Planning and Natural Resources). Submitted to Cunninghamia; Lilley, D.M. & Tidemann, C.R. (1994) Flora and fauna of Buddigower Nature Reserve NSW. Report to NSW National Parks and Wildlife Service (School of Resources and Environmental Management Aust. National University: Canberra); Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Miles, C. (2000) Classification and mapping of broad vegetation types (BVTs) for the NSW Murray Catchment. Unpublished. (Murray Catchment Trust: Albury); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Porteners, M.F. (1993) The natural vegetation of the Hay Plain: Booligal-Hay and Deniliquin-Bendigo 1:250 000 maps. Cunninghamia 3(1) 1-122; Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); 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; Sluiter, I.R.K., Minchin, P.R. & Jaensch, S.C. (1997) The Buloke and pine woodlands of semi-arid and dry sub-humid Victoria and nearby areas. Report to Environment Australia. (Victorian Dept.

Natural Resources and Environment: Mildura); Western Riverina Regional Vegetation Committee (2001) Draft Western Riverina Regional Vegetation Management Plan. (Western Riverina RVC: Deniliquin); White, M. (2002b) Pre-European mapping of the Riverina. Unpublished GIS map. (Ecology Australia: Fairfield, Victoria); Seddon, J., Briggs, S. & Doyle, S. (2002) Little River Catchment biodiversity assessment. Report. (NSW National Parks and Wildlife Service c/- CSIRO Sustainable Ecosystems: Canberra); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 82

**Common Name:** Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion

**Scientific Name:** *Eucalyptus microcarpa* - *Eucalyptus populnea* subsp. *bimbil* - *Callitris glaucophylla* / *Acacia deanei* subsp. *paucijuga* - *Dodonaea viscosa* subsp. *spatulata* - *Pimelea microcephala* subsp. *microcephala* - *Eremophila mitchellii* / *Monachather paradoxus* - *Calotis cuneifolia* - *Austrostipa scabra* subsp. *scabra* - *Einadia nutans* subsp. *nutans*

**Veg. Comm. ID.:** 82 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID82a\_SWS0507400.jpg Poplar Box (*Eucalyptus populnea*) - Western Grey Box (*Eucalyptus microcarpa*) - White Cypress Pine (*Callitris glaucophylla*) open woodland on red loam soil west of Lake Cowal, central NSW, [AGD66 33°33.270'S 147°22.272'E], 31/5/2007, Jaime Plaza.



**Photo 2:** ID82b\_img143pc.jpg *Eucalyptus microcarpa* - *Callitris glaucophylla* woodland, north of Rankins Springs, [AGD66 33°48'41.4"S 146°17'57.2"E], 18/4/02, Jaime Plaza.



**Photo 3:** ID82c\_Ballestrin.jpg *Eucalyptus microcarpa* - *E. populnea* - *Callitris glaucophylla* woodland, Woolshed section of Cocoparra National Park, 21/10/2004, M. Ballestrin.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Eucalyptus microcarpa*; *Eucalyptus populnea* subsp. *bimbi*; *Callitris glaucophylla*; *Allocasuarina luehmannii*; *Pittosporum angustifolium*; *Brachychiton populneus* subsp. *populneus*.

**Shrubs/Vines/Epiphytes:** *Dodonaea viscosa* subsp. *spatulata*; *Geijera parviflora*; *Acacia deanei* subsp. *paucijuga*; *Pimelea microcephala* subsp. *microcephala*; *Eremophila mitchellii*; *Myoporum montanum*; *Apophyllum anomalum*; *Eremophila glabra* subsp. *glabra*; *Parsonia eucalyptophylla*; *Bertya cunninghamii*; *Acacia montana*; *Olearia pimeleoides*; *Myoporum montanum*; *Maireana aphylla*; *Acacia hakeoides*; *Eremophila longifolia*; *Senna form taxon 'zygophylla'*; *Abutilon fraseri*; *Ptilotus obovatus*.

**Ground Cover:** *Monachather paradoxus*; *Calotis cuneifolia*; *Austrostipa scabra* subsp. *scabra*; *Einadia nutans* subsp. *nutans*; *Enteropogon acicularis*; *Eragrostis lacunaria*; *Sclerolaena bicornis* var. *bicornis*; *Walwhalleya subxerophilum*; *Aristida jerichoensis* var. *subspinulifera*; *Austrodanthonia caespitosa*; *Paspalidium constrictum*; *Sclerolaena diacantha*; *Sclerolaena birchii*; *Chenopodium desertorum* subsp. *desertorum*; *Cheilanthes sieberi* subsp. *sieberi*; *Austrostipa verticillata*; *Dichondra repens*; *Goodenia hederacea* subsp. *hederacea*; *Vittadinia cuneata* var. *hirsuta*; *Elymus scaber* var. *scaber*; *Carex inversa*; *Glycine tabacina*; *Oxalis perennans*; *Rostellularia adscendens* var. *adscendens*; *Sida corrugata*; *Wahlenbergia communis*; *Digitaria brownii*; *Calotis lappulacea*; *Sida cunninghamii*; *Solanum ellipticum*; *Dianella porracea*.

**Weed Species:** *Lycium ferocissimum*; *Carthamus lanatus*; *Hypochaeris radicata*; *Hypochaeris radicata*; *Sonchus oleraceus*; *Echium plantagineum*.

**Weediness:** Medium (5-15%) with <10% cover.

**Threatened Plants:** *Pterostylis hamata*; *Capparis loranthifolia* var. *loranthifolia*; *Diuris sheaffiana*; *Swainsona sericea*.

**Threatened Fauna:** Australian Bustard; Bush Stone-curlew; Major Mitchell's Cockatoo; Red-tailed Black-Cockatoo; Glossy Black-Cockatoo; Pied Honeyeater; Little Pied Bat; Chestnut Quail-thrush; Grey Falcon; Squatter Pigeon; Painted Honeyeater; Brolga; Square-tailed Kite; Hooded Robin (south-eastern form); Black-chinned Honeyeater (eastern subspecies); Barking Owl; Eastern Long-eared Bat (south eastern form); Koala; Grey-crowned Babbler (eastern subspecies); Grey-crowned Babbler (eastern subspecies); Speckled Warbler; Yellow-bellied Sheath-tail-bat; Diamond Firetail; Masked Owl; Hairy-nosed freetail bat.

**Mean Species Richness:** 31 (Porteners 2001 in 20x20 m plots); 50±2 (floristic group 10 in Lewer et al. 2002 in 20x20 m plots).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland between 12 and 25 m high dominated by Western Grey Box (*Eucalyptus microcarpa*), Poplar Box (*Eucalyptus populnea* subsp. *bimbi*) and White Cypress Pine (*Callitris glaucophylla*). Kurrajong (*Brachychiton populneus*) and Buloke (*Allocasuarina luehmannii*) may be present. Shrubs are sparse and include Deanes Wattle (*Acacia deanei*), Shrubby Rice Flower (*Pimelea microcephala* subsp. *microcephala*), Budda (*Eremophila mitchellii*), Wilga (*Geijera parviflora*), hop bush (*Dodonaea viscosa* subsp. *spatulata*), Tar Bush (*Eremophila glabra* subsp. *glabra*) and daisy bush *Olearia pimelioides*). The ground cover is sparse and contains forbs such as Purple Burr daisy (*Calotis cuneifolia*), Yellow Burr Daisy (*Calotis lappulacea*), *Oxalis perennans*, fuzze weed (*Vittadinia cuneata*) and kidney weed (*Dichondra repens*). Grass species include *Austrostipa scabra* subsp. *scabra*, *Monachather paradoxus*, *Walwhalleya subxerophilum*, *Eragrostis lacunaria*, *Enteropogon acicularis* and *Austrodanthonia caespitosa*. Occurs on red-brown earths soils comprising Quaternary alluvium often as terraces on old alluvial plains or undulating peneplain landforms overlaying a range of underlying rock types including sandstone. Distributed in central western NSW mostly in the eastern section of the Cobar Peneplain Bioregion near Nymagee, Tottenham and Boona and extending southwards Griffith. Most of this community has been cleared for agriculture and remaining areas are threatened. As of 2005 it was poorly sampled in protected areas.

**Level of Classification:** Association.

**Classification Confidence Level:** High.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Inland Plains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a shrubby understorey.

**Forest Type (RN 17):** 203 - Western Box (P).

**Authority(s):** (Quantitative Data). Probably includes most of map unit P13 in Sivertsen & Metcalfe (2001) and forms part of P4 in Sivertsen & Metcalfe (1995). Includes part of map unit 10 in Pickard & Norris (1994). Similar to the "Eucalyptus woolliana -Eucalyptus populifolia" association on page 507 of Moore (1953a). This community also equates to the Grey Box community map unit GRW in Dykes (2002) for Cobar Shire. Includes Floristic Group 10 being part of map unit PNP2 and PNP3 in Lewer et al. (2003) which provides a detailed description. Probably part of community C10 in Beeston et al. (1980). Probably includes communities 8, 9 and 11 in Austin et al. (2000) for the central and northwestern sections of the central Lachlan region. Part of Biolandscape Lacm25c in Priday (2006). Described for Woggoon NR by Porteners (2001a). Part of BVTs 20 in DEC (2006).

**Interstate Equivalent(s):** None known.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mapped as community P13 in Sivertsen & Metcalfe (2001), also part of map unit P4 in Sivertsen & Metcalfe (1995). Sampled but mapped as a broader unit in Lewer et al. (2003). Map unit GRW in Cobar Shire in Dykes (2002). Needs more sampling in its far west and southern distribution.

**Climate Zone:** Temperate: no dry season (hot summer); Semi-arid: warm (winter rain).

**IBRA Bioregion (v6):** Cobar Peneplain (30-70%); Murray-Darling Depression (1-30%); NSW South-western Slopes (1-30%).

**IBRA Sub-Region:** Darling Depression (1-30%); Lower Slopes (1-30%); Nymagee (30-70%).

**Botanical Division:** South Western Plains (SWP) (>70%); Central Western Slopes (CWS) (1-30%).

**Local Govt. Areas:** Bogan (1-30%); Cobar (1-30%); Lachlan (1-30%); Narromine (1-30%); Griffith (1-30%); Carrathool (1-30%).

**CMAs:** Central West (30-70%); Lachlan (30-70%); Western (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium.

**Lithology:** Alluvial loams and clays; Gravel.

**Great Soil Group:** Red earth; Red-brown earth.

**Soil Texture:** Clay loam; Loam; Sandy clay loam.

**Landform Patterns:** Peneplain; Plain; Rises; Terrace (alluvial).

**Landform Elements:** Footslope; Hillslope; Plain; Terrace flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 400000 ha ±30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate from assuming 80% has been cleared in the Central Division and 50% in the Western Division. This vegetation community was much more widespread before clearing.

**Current Extent:** 100000 ha ±30% or 25% ± 60% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Assumed to be about one third or 30000 ha of map unit PNP2 and half or 6000 ha of map unit PNP3 are floristic group 10 in Lewer et al. (2003) covering part of its distribution. Approximately 60000 ha mapped as map unit P13 for Nymagee, Narromine and Dubbo regions by Sivertsen & Metcalfe (2001). Pickard & Norris (1994) mapped 43,200 ha in an area that partially overlaps the area mapped by Sivertsen & Metcalfe (2001). Also, it is assumed that a proportion of the map unit P4 mixed woodlands in Sivertsen & Metcalfe (1995) contains this community. Austin et al. (2000) indicate that 21% of their community 8 (part of this ID82) remains in the western Lachlan region. Dykes (2002) maps 1740 ha in the south-eastern section of Cobar Shire as map unit GRW. Additional areas to the south are unmapped. Mostly cleared in Central Division but some reasonable-sized areas remain in the Western Division.

**Conservation Reserves:** Cocoparra NP 3 (E1); Cocoparra NR 64 (E1); Strahorn FR 30 (E3); Woggoon NR 200 (E1).

**Reserves Total Area:** 297 ha.

**No. Representatives in Reserves:** 4

**Protected Area Explanation:** Not mapped in any reserves by Sivertsen & Metcalfe (2001) or Pickard & Norris (1994). Woggoon NR estimate from maps in Porteners (2001a). Cocoparra National Park and Cocoparra Nature Reserve estimates from map unit 1a in Whiting (1997). PA CD9910 from P13 in Sivertsen & Metcalfe (2001) and PNP2 in Lewer et al. (2003). PA WE9902 estimated from notes in DIPNR PANet database but this may be inaccurate. Strahorn Flora Reserve estimate from map unit PNP2 in Lewer et al. (2003) and notes in Forestry Commission (1989a) that state that both Box-Pine woodland and pure Pine stands are in the reserve.

**Secure Property Agreements:** CD9910 PA 36 (E1); WE9902 PA 15 (E1).

**Secure PAs Total Area:** 51 ha.

**No. Representatives in Secure Property Agreements:** 2

**Protected Current Extent:** 0.34% 348 ha ± 10%.

**No. Representatives in Protected Areas:** 6

**Protected Pre-European Extent:** 0.08% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Targeted survey required in Nymagee region. Site data and mapping in Sivertsen & Metcalfe (2001, 1995) and other mapping may assist. Protection of a selection of Western Lands Leases on eastern edge of Western Division may be an option to protect samples of this community. Small areas occur along roads near Lake Cowal.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Species composition is affected by grazing intensity and soil variation.

**Fire Regime:** Highly fragmented and many areas are now rarely burnt. The pre-European burning regime is unknown but there may have been 10-40 year intervals between wildfires.

**Adjoining Communities:** This Western Grey Box community occupies country to the west and south west of community ID81 (Grey Box in BBS Bioregion) and grades into Cypress Pine - Poplar Box (ID72), Eucalyptus intertexta (ID104) and Eucalyptus populnea (ID103, 105) communities on the Cobar Peneplain in drier areas to the west. Grades into and similar to ID80 on the NSW south western slopes and the south-western plains but the latter does not contain Poplar Box and contains different understorey species as it receives more winter rainfall. Grades into Green Mallee (Eucalyptus viridis) and ID217 (Western Grey Box - Mugga Ironbark) on gravel rises.

**Threatening Processes:** An endangered community that is threatened by further clearing and occurs in one of the hotspots in NSW for clearing during 1990 - 2003. Soil erosion, weed invasion, woody native weeds, and loss of understorey through heavy grazing are other threats.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Soil erosion; Unsustainable grazing and trampling by stock; Unsustainable grazing by introduced animals; Weed (exotic) invasion; Woody shrub (native) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4; 5.

**Planning Controls:**

**Planning and Management:** Protect from further clearing and over-grazing.

**Listed Under Legislation:** Listed TSC Act, E: Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act, E: Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (183; 142; 282; 24; 293; 166; 27; 273; 34; 46; 143; 356; 372). Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Beeston, G.R., Walker, P.J., Purdie, R. & Pickard, J. (1980) Plant communities of the Poplar Box (Eucalyptus populnea) lands of eastern Australia. Australian Rangelands 2: 1-30; Dykes, P. (2002) Vegetation communities of the Cobar Shire. Unpublished report. (Department of Land and Water Conservation, Far West Region: Dubbo); Forestry Commission of NSW (1989a) Forest preservation in state forests of New South Wales. Research Note No. 47. (Forestry Commission of NSW: Sydney); Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. & Ryan, C. (2003) Native vegetation map report Bogon Gate, Boona Mount, Condobolin, Dandaloo, Tottenham and Tullamore 1:100 000 map sheets. (NSW Department of Infrastructure, Planning and Natural Resources). Submitted to Cunninghamia; Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Pickard, J. & Norris, E.H. (1994) The natural vegetation of north-western New South Wales: notes to accompany the 1:1 000 000 vegetation map sheet. Cunninghamia 3(3): 423-464; Porteners, M.F. (2001a) Vegetation survey of Woggoon and Tollingo Nature Reserves. Report for the NSW National Parks and Wildlife Service; 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; Sivertsen, D. & Metcalfe, L. (2001) Northern wheatbelt vegetation mapping. Unpublished 1:250 000 scale vegetation maps and vegetation descriptions covering northern NSW wheatbelt. (NSW National Parks and Wildlife Service: Hurstville); Whiting, E. (1997) Vegetation survey of Cocoparra National Park and Cocoparra Nature Reserve. Unpublished report (NSW National Parks and Wildlife Service: Griffith District); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 237

**Common Name:** Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone

**Scientific Name:** *Eucalyptus microcarpa* - *Eucalyptus camaldulensis* subsp. *camaldulensis* / *Acacia acinacea* - *Maireana enchylaenoides* / *Paspalidium jubiflorum* - *Austrodanthonia caespitosa* - *Juncus flavidus* - *Atriplex semibaccata*

**Veg. Comm. ID.:** 237 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID237a\_img021pc.jpg *Eucalyptus microcarpa* woodland, Millewa State Forest, [AGD66 35°48'17.3"S 145°08'48.1"E], 10/4/02, Jaime Plaza.



**Photo 2:** ID237b\_img022pc.jpg *Eucalyptus microcarpa* woodland, Millewa State Forest, [AGD66 35°48'17.3"S 145°08'48.1"E], 10/4/02, Jaime Plaza.



**Photo 3:** ID237c\_img382ps.jpg Western Grey Box (*Eucalyptus microcarpa*) open-forest in Ulupna Island Flora and Fauna Reserve (north of Strathmerton), Reserve Track, approx. 1.4 km from junction of Ulupna Creek and River Murray, Victoria; 14/11/1987, Peter Smith.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus microcarpa*; *Eucalyptus camaldulensis* subsp. *camaldulensis*; *Eucalyptus largiflorens*;

*Allocasuarina luehmannii*.

**Shrubs/Vines/Epiphytes:** *Acacia acinacea*; *Acacia dealbata*; *Maireana enchylaenoides*; *Sclerolaena muricata* var. *muricata*.

**Ground Cover:** *Paspalidium jubiflorum*; *Austrodanthonia caespitosa*; *Juncus flavidus*; *Atriplex semibaccata*; *Carex inversa*; *Einadia nutans* subsp. *nutans*; *Austrodanthonia laevis*; *Chloris truncata*; *Sida corrugata*; *Oxalis perennans*; *Carex appressa*; *Rumex brownii*; *Enteropogon ramosus*; *Salsola tragus* subsp. *tragus*; *Chenopodium desertorum* subsp. *microphyllum*; *Brachyscome basaltica* var. *gracilis*; *Oxalis perennans*; *Austrostipa scabra* subsp. *falcata*; *Wahlenbergia fluminalis*.

**Weed Species:** *Heliotropium europaeum*; *Echium plantagineum*; *Vulpia myuros*; *Hordeum leporinum*; *Cirsium vulgare*; *Bromus diandrus*; *Bromus hordeaceus*; *Bromus madritensis*; *Marrubium vulgare*; *Avena fatua*; *Lolium rigidum*; *Chondrilla juncea*; *Carduus tenuiflorus*; *Trifolium striatum*; *Trifolium campestre*; *Trifolium glomeratum*; *Trifolium tomentosum*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed (Superb Parrot?).

**Mean Species Richness:** 37±5 with about 21 (58%) exotic spp. (community 34 in Smith & Smith 1990).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland with trees up to 20 m high dominated by Western Grey Box (*Eucalyptus microcarpa*) often with River Red Gum (*Eucalyptus camaldulensis* subsp. *camaldulensis*) of Black Box (*Eucalyptus largiflorens*) and often grading into Yellow Box (*Eucalyptus melliodora*) and Buloke (*Allocasuarina luehmannii*) on lighter soils. Shrubs are absent or very sparse. Golden dust Wattle (*Acacia acinacea*) may be present along with the low shrub *Maireana enchylaenoides*. The ground cover may be dense or sparse depending on time since rain. It includes grass species such as *Austrodanthonia caespitosa*, *Austrodanthonia laevis*, *Paspalidium jubiflorum* and *Chloris truncata*. The rush *Juncus flavidus* and the sedge *Carex inversa* are often present along with small chenopod shrubs such as *Atriplex semibaccata* and *Einadia nutans* subsp. *nutans*. Forbs species include *Sida corrugata*, *Oxalis perennans* and *Rumex brownii*. Occurs on grey clays on slight rises on floodplains dominated by River Red Gum forests mainly along the Murray and Murrumbidgee Rivers of south-western NSW from near Albury in the east to west of the Millewa forests near Deniliquin. Restricted in extent. Grades into River Red Gum, Yellow Box or Black Box woodlands.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** Eucalyptus Communities of Inland Watercourses and Inner Floodplains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus woodlands with a grassy understorey.

**Forest Type (RN 17):** 200 - River Red Gum-Black Box/Coolabah (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Riparian part of Moore (1953a) *Eucalyptus woollsiana* alliance. Includes community 34 with species listed in Table 1.2 in Smith & Smith (1990) for Murray River riparian zone. Probably includes part of Biolandscape SouA75 in Priday (2006). Species noted in Benson (1999-2009). Often occurs near a similar Yellow Box riparian community (ID74). Closely allied and grade into ID76 (Western Grey Box on alluvial red loams) but differs by containing less shrubs and more floodplain species in the ground cover. It occurs on clay or loam soils on floodplains among River Red Gum forest/woodland.

**Interstate Equivalent(s):** Victoria: part of EVC 235 Plains Woodland / Herb-rich Gilgai Wetland Mosaic.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Difficult to distinguish from related Yellow Box community along rivers but Mappable as a broad unit. Most of extent mapped as part of broad Mixed Box Woodland map unit in Margules & Partners (1990) along Murray River.

**Climate Zone:** Temperate: no dry season (hot summer); Semi-arid: warm (winter rain).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); Riverina (30-70%).

**IBRA Sub-Region:** Lachlan (1-30%); Lower Slopes (1-70%); Murray Fans (30-70%); Murrumbidgee (1-30%).

**Botanical Division:** Central Western Slopes (CWS) (1-30%); South Western Plains (SWP) (30-70%); South Western Slopes (SWS) (1-30%).

**Local Govt. Areas:** Albury (1-30%); Berrigan (1-30%); Bland (1-30%); Deniliquin (1-30%); Greater Hume (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%); Wagga Wagga (1-30%); Wakool (1-30%).

**CMAs:** Lachlan (1-30%); Murray (30-70%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium.

**Lithology:** Clay.

**Great Soil Group:** Grey clay; Grey earth.

**Soil Texture:** Clay loam; Heavy clay; Medium clay.

**Landform Patterns:** Flood plain.

**Landform Elements:** Plain; Terrace plain.

**Land Use:** Cropping and Horticulture; Grazing; Timber Production.

**Impacts of European Settlement:** Major alteration of species composition; Medium reduction (30-70%) in extent and/or range.

**Pre-European Extent:** 15000 ha ±50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate only. Substantial areas probably occurred in areas now cleared.

**Current Extent:** 4000 ha ±30% or 27% ± 70% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Margules & Partners (1990) maps approximately 6000 ha of Mixed Box Woodland along Murray River half of which may be this community and half ID74 Yellow Box woodland. Small areas occur along the Murrumbidgee River.

**Conservation Reserves:** Billabong FR 2 (E3); Sanddune Pine FR 3 (E3); Toupna Creek FR 13 (E3).

**Reserves Total Area:** 18 ha.

**No. Representatives in Reserves:** 3

**Protected Area Explanation:** Estimates of areas in conservation reserves along Murray River (Billabong, Sanddune Pine, Toupna Creek Flora Reserves) have been derived from descriptions in Forestry Commission (1989a) and by overlaying the distribution of the communities defined by Smith & Smith (1990) with the structural mapping by Margules & Partners (1990) and Murray River forests forest typing by State Forests of NSW.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 0.45% 18 ha ± 50%.

**No. Representatives in Protected Areas:** 3

**Protected Pre-European Extent:** 0.12% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Areas on the Murray River floodplain including in a number of state forests such as Gulpi State Forest.

**Degree of Fragmentation:** Naturally fragmented stands of variable patch sizes with <50% extent remaining.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Large floods inundate this community but it is generally on higher ground than River Red Gum. Shrubs were probably more abundant prior to stock grazing.

**Fire Regime:** Rarely burns due to lack of ground biomass.

**Adjoining Communities:** Grades into various types of River Red Gum forest or woodland, or Black Box Woodland (ID13). Occurs in similar locations to ID74 (Riverine Yellow Box). Grades into the more widespread Western Grey Box communities ID76 and ID80 on alluvial plains distant from the rivers.

**Threatening Processes:** Past clearing has been the main cause of decline, however grazing and weed invasion are ongoing impacts that affect most stands.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Forestry activities including logging; Salinity; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Protect this community from clearing or intensive grazing in Murray and Murrumbidgee catchment management plans.

**Listed Under Legislation:** Listed TSC Act, E: Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act, E: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Part).

**Recovery Plan:** Doesn't exist and not required.

**Reference List:** (308; 11; 166; 9; 356). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Margules & Partners (1990) River Murray Riparian Vegetation Study. (Murray-Darling Basin Commission: Canberra); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Smith, P. & Smith J. Ecological Consultants (1990) Floristic Communities. In River Murray Riparian Vegetation Study. (Murray-Darling Basin Commission: Canberra); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan.



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 248

**Common Name:** Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW

**Scientific Name:** *Eucalyptus microcarpa* - *Eucalyptus melliodora* - *Eucalyptus populnea* subsp. *bimbil* / *Senna form taxon 'zygophylla'* - *Myoporum montanum* - *Hakea tephrosperma* / *Austrostipa scabra* subsp. *scabra* - *Enteropogon acicularis* - *Calotis lappulacea* - *Maireana enchylaenoides*

**Veg. Comm. ID.:** 248 **Original Entry:** John Benson 31/12/2005

**Photo 1:** ID248a\_DIPNR.jpg Mixed woodland of central NSW with *Eucalyptus microcarpa*, *Eucalyptus populnea*; Steve Lewer 2002, DIPNR Dubbo.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Eucalyptus microcarpa*; *Eucalyptus melliodora*; *Eucalyptus populnea* subsp. *bimbil*; *Alectryon oleifolius* subsp. *canescens*.

**Shrubs/Vines/Epiphytes:** *Senna form taxon 'zygophylla'*; *Hakea tephrosperma*; *Myoporum montanum*; *Acacia deanei* subsp. *deanei*; *Maireana microphylla*; *Sclerolaena muricata*.

**Ground Cover:** *Austrostipa scabra* subsp. *scabra*; *Enteropogon acicularis*; *Calotis lappulacea*; *Maireana enchylaenoides*; *Einadia nutans* subsp. *nutans*; *Sida corrugata*; *Elymus scaber* var. *scaber*; *Atriplex semibaccata*; *Atriplex spinibractea*; *Sclerolaena diacantha*; *Salsola tragus* subsp. *tragus*; *Vittadinia cuneata*; *Calotis cuneifolia*; *Oxalis perennans*.

**Weed Species:** *Lycium ferocissimum*; *Lepidium africanum*; *Lolium rigidum*; *Marrubium vulgare*; *Medicago truncatula*; *Sonchus oleraceus*; *Trifolium arvense*; *Trifolium angustifolium*; *Echium plantagineum*; *Hordeum leporinum*; *Avena ludoviciana*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** None recorded.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 43±5 (floristic group 39 in Lewer et al. 2003 in 20x20 m plots).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland averaging about 14 m high dominated by a number of box eucalypts including Western Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) and Polar Box (*Eucalyptus populnea* subsp. *bimbil*) with Western Rosewood (*Alectryon oleifolius* subsp. *canescens*) as a small tree. Shrubs are very sparse or absent. They include *Senna form taxon 'zygophylla'*, *Hakea tephrosperma*, *Myoporum montanum*, *Acacia deanei* subsp. *deanei* and *Maireana microphylla*. The ground cover is usually mid-dense and is dominated by grasses such as *Austrostipa scabra* subsp. *scabra*, *Enteropogon acicularis* and *Elymus scaber* var. *scaber* along with forbs such as *Calotis lappulacea*, *Sida corrugata*, *Vittadinia cuneata* and *Atriplex semibaccata*. Low shrubs such as *Maireana enchylaenoides* and *Sclerolaena diacantha* may be present. Occurs on sandy loam soils on low rises on alluvial and stagnant alluvial plains in central NSW of the Lachlan River alluvial plain. Mainly in the north-western section of the NSW South Western Slopes and eastern section of the Cobar Peneplain Bioregions. Most of this community has been cleared for grazing or cropping and remnants have been heavily grazed.

**Level of Classification:** Association.

**Classification Confidence Level:** Low.

**Formation Group:** Eucalyptus (Mostly Grassy) Box Woodlands of the Inland Plains.

**State Veg Map (Keith 2004):** Floodplain Transition Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus woodlands with a grassy understorey.

**Forest Type (RN 17):** 203 - Western Box (P).

**Authority(s):** (Quantitative Data). Equivalent to floristic group 39 being part of map unit ALP6 in Lewer et al. (2003). Similar in some respects to ID82 on the Cobar Peneplain but this community lacks Cypress Pine and contains an open understorey dominated by grasses. A mixed woodland community occurring on low rises on alluvial plains in central NSW.

**Interstate Equivalent(s):** Victoria: some similarity with EVC803: Plains Woodland.

**Mapped/Modelled:** Current extent and pre-European extent mapped or modelled as part of a broader community.

**Sampling:** Inadequate.

**Mapping Info:** Part of distribution mapped as part of ALP6 in Lewer et al. (2003). Not sampled or mapped over full range as of 2005.

**Climate Zone:** Temperate: no dry season (hot summer).

**IBRA Bioregion (v6):** Cobar Peneplain (30-70%); NSW South-western Slopes (30-70%).

**IBRA Sub-Region:** Lachlan Plains (30-70%); Lower Slopes (30-70%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%); South Western Plains (SWP) (30-70%).

**Local Govt. Areas:** Bogan (1-30%); Carrathool (1-30%); Lachlan (1-30%); Narromine (1-30%).

**CMAs:** Central West (1-30%); Lachlan (30-70%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium.

**Lithology:** Alluvial loams and clays.

**Great Soil Group:** Alluvial soil; Brown earth.

**Soil Texture:** Sandy loam.

**Landform Patterns:** Alluvial plain; Rises; Stagnant alluvial plain.

**Landform Elements:** Plain.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 50000 ha ±50%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate only. Mostly cleared.

**Current Extent:** 10000 ha ±50% or 20% ± 80% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Perhaps half of the 10600 ha mapped in map unit ALP6 in Lewer et al. (2003) and would extend beyond the boundaries of that mapping. Most of the original extent of this map unit has been cleared based on clearing patterns.

**Conservation Reserves:** None.

**Reserves Total Area:** 0 ha.

**No. Representatives in Reserves:** 0

**Protected Area Explanation:**

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** Not known to be protected.

**No. Representatives in Protected Areas:** 0

**Protected Pre-European Extent:** 0% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Areas south of the Lachlan River.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** A mixed community that is pseudo-ecotonal between Western Grey Box on heavier soils and Poplar Box on loam soils. Occurs on slight rises on the alluvial plain.

**Fire Regime:** Fire is now largely absent due to fragmentation.

**Adjoining Communities:** Grades into Poplar Box (ID244), Western Grey Box (ID82, ID76) on different soils on the alluvial plains.

**Threatening Processes:** Mostly cleared and fragmented. Weeds dominate many sites. Overgrazing affects understorey condition.

**Threatening Process List:** Clearing for agriculture; Dryland cropping; Firewood collection; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Remnants require protection from clearing under Lachlan and central-West catchment plans. Some areas should be fenced off from continuous grazing. Samples should be protected in reserves or under property agreements.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (293). Lewer, S., Ismay, K., Grounds, S., Gibson, R., Harris, M., Armstrong, R., Deluca, S. & Ryan, C. (2003) Native vegetation map report Bogan Gate, Boona Mount, Condobolin, Dandaloo, Tottenham and Tullamore 1:100 000 map sheets. (NSW Department of Infrastructure, Planning and Natural Resources). Submitted to Cunninghamia;.





# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 283

**Common Name:** Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South-western Slopes Bioregions

**Scientific Name:** *Eucalyptus bridgesiana* - *Eucalyptus blakelyi* / *Acacia dealbata* / *Microlaena stipoides* var. *stipoides* - *Gonocarpus tetragynus* - *Dichondra repens* - *Poa sieberiana*

**Veg. Comm. ID.:** 283 **Original Entry:** J.S Benson 27/01/2006

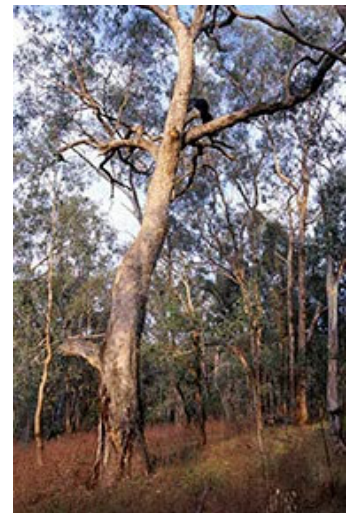
**Photo 1:** ID283a\_PC208-3.jpg *Eucalyptus bridgesiana* - *Acacia dealbata* gully herbaceous woodland in Ellerslie Nature Reserve, [AGD66 35°14'33"S 147°51'30"E], 20/10/02, Jaime Plaza.



**Photo 2:** ID283b\_PC188-10.jpg *Eucalyptus albens* - *E. brigesiana* - *E. blakelyi* herbaceous grassy gully woodland, Livingstone National Park, [AGD66 35°20'50"S 147°20'42"E], 15/10/02, Jaime Plaza.



**Photo 3:** ID283c\_PC192-3.jpg *Eucalyptus bridgesiana* - *E. melliodora* valley woodland on the Little Billabong - Tumbarumba Road, [AGD66 35°33'20"S 147°37'02"E], 15/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus bridgesiana*; *Eucalyptus blakelyi*; *Eucalyptus melliodora*; *Eucalyptus macrorhyncha*.

**Shrubs/Vines/Epiphytes:** *Acacia dealbata*; *Acacia implexa*; *Acacia paradoxa*; *Cassinia aculeata*; *Leptospermum continentale*; *Callistemon sieberi*; *Pultenaea procumbens*; *Pultenaea subspicata*.

**Ground Cover:** *Microlaena stipoides* var. *stipoides*; *Dichondra repens*; *Gonocarpus tetragynus*; *Acaena ovina*; *Hydrocotyle laxiflora*; *Themeda australis*; *Elymus scaber* var. *scaber*; *Scleranthus pungens*; *Senecio hispidulus*; *Hypericum gramineum*; *Poa sieberiana*; *Drosera peltata*; *Pteridium esculentum*; *Cheilanthes austrotaeniifolia*; *Hypoxis hygrometrica* var. *hygrometrica*; *Drosera auriculata*; *Arthropodium minus*; *Poranthera microphylla*; *Ranunculus inundatus*; *Senecio prenanthoides*; *Epilobium billardioreanum* subsp. *hydrophilum*; *Craspedia variabilis*; *Solenogyne dominii*; *Plantago hispida*; *Bulbine bulbosa*; *Viola hederacea*; *Haloragis heterophylla*; *Cyperus lucidus*; *Luzula meridionalis*; *Carex appressa*; *Schoenus apogon*; *Luzula densiflora*; *Urtica incisa*; *Rumex brownii*; *Drosera peltata*; *Cymbonotus lawsonianus*; *Bothriochloa macra* *Poa labillardierei* var. *labillardierei*; *Schoenus apogon*; *Juncus vaginatus*; *Juncus subsecundus*; *Lythrum hyssopifolia*; *Plantago gaudichaudii*; *Plantago varia*; *Themeda australis*; *Tricoryne elatior*; *Solenogyne dominii*; *Senecio quadridentatus*; *Senecio tenuiflorus*; *Viola betonicifolia*; *Wurmbea dioica* subsp. *dioica*; *Vittadinia cuneata*; *Wahlenbergia communis*; *Wahlenbergia gracilis*; *Wahlenbergia stricta* subsp. *stricta*; *Microseris lanceolata*; *Panicum effusum*; *Hypericum gramineum*; *Glycine clandestina*; *Elymus scaber* var. *scaber*; *Eragrostis parviflora*; *Echinopogon ovatus*.

**Weed Species:** *Bromus hordeaceus*; *Rosa rubiginosa*; *Rubus ulmifolius*; *Hypericum perforatum*; *Aira caryophyllea*; *Hypochoeris radicata*; *Centaurium erythraea*; *Trifolium campestre*; *Trifolium dubium*; *Cirsium vulgare*; *Marrubium vulgare*; *Cerastium glomeratum*; *Anagallis arvensis*; *Trifolium repens*; *Holcus lanatus*; *Bromus molliformis*; *Bromus diandrus*.

**Weediness:** Very high (>30%) with 10-30% cover.

**Threatened Plants:** *Acacia phasmoides*.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 35 +/- 10 spp in 20 x 20 m plots (Gellie & Fanning 2004).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Open Forest; Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall open forest or woodland dominated by Apple Box (*Eucalyptus bridgesiana*) often with Blakely's Red Gum (*Eucalyptus blakelyi*) or Yellow Box (*Eucalyptus melliodora*). The shrub layer is very sparse or absent and often contains wattes such as *Acacia dealbata* at higher elevations or *Acacia deanii* and *Acacia implexa* in western locations along with *Cassinia* and *Leptospermum*. The ground cover is mid-dense to dense and dominated by grass species such as *Microlaena stipoides* var. *stipoides*, *Elymus scaber* var. *scaber* and *Themeda australis*. Forb species include *Dichondra repens*, *Acaena ovina*, *Hydrocotyle laxiflora*, *Epilobium billardioreanum* subsp. *hydrophilum*, *Craspedia variabilis* and *Solenogyne dominii*. Sedges include such as *Cyperus lucidus* and *Carex appressa* and the rush *Luzula meridionalis* may be present. Occurs on clay loams or silty clay loam soils derived from colluvium or sedimentary, metamorphic, igneous or volcanic substrates on flats and gentle hillslopes in hill landscape patterns of the NSW South-western Slopes Bioregion. Grades into Blakely's Red Gum and Yellow Box dominated communities. Mostly cleared and often infested with weeds. An endangered community.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Southern Tableland Grassy Woodlands; Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 103 - Apple Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). A widespread broadly typed community on the NSW SW Slopes including community 7 in Austin et al.(2000). Community D9 in Seddon et al.(2002). Community C12 in Bos & Lockwood (1996). Includes Vegetation Group 12 in Gellie & Fanning (2004). Vegetation group 21 in EcoGIS (2005). Some similarities to Vegetation Groups 154 and 159 in Gellie (2005). Probably includes part of Biolandscapes SouV24 and UlaV39a in Priday (2006). Probably includes most or part of the Blakely's Red Gum - Apple Box community in NPWS (2002a) for Boorowa Shire. Noted in various locations in Benson (1999-2009)

**Interstate Equivalent(s):** Victoria: EVC 47 Valley Grassy Forest.

**Mapped/Modelled:** Current extent and pre-European extent not mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Not mapped over range and limited site sampling as of 2006. Difficult to map out from other box woodlands except for riparian zones.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); South Eastern Highlands (1-30%).

**IBRA Sub-Region:** Bathurst (1-30%); Crookwell (1-30%); Monaro (1-30%); Murrumbateman (1-30%); Orange (1-30%); Upper Slopes (30-70%).

**Botanical Division:** South Western Slopes (SWS) (1-30%); Southern Tablelands (ST) (1-30%); Central Western Slopes (CWS) (1-30%).

**Local Govt. Areas:** Bathurst Regional (1-30%); Bland (1-30%); Blayney (1-30%); Cabonne (1-30%); Cootamundra (1-30%); Cowra (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Upper Lachlan (1-30%); Young (1-30%); Wellington (1-30%); Wagga Wagga (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Colluvium; Plutonic rocks; Metamorphic rocks; Sedimentary rocks; Volcanic rocks.

**Lithology:** Basalt; Colluvial sediments; Conglomerate; Granite; Metamorphic rock (unidentified); Sandstone; Shale.

**Great Soil Group:** Brown earth; Brown podzolic soil.

**Soil Texture:** Clay loam; Silty clay loam.

**Landform Patterns:** Hills.

**Landform Elements:** Footslope; Hillslope; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Dieback due to disease or senescence; Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 35000 ha ±50%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Gellie (2005) models about 18000 ha as Vegetation Group 159 for part of its range. 3084 ha predicted to have occurred in Boorowa Shire (2002a) of which nearly 78% has been cleared.

Friday, 27 January 2012

**Current Extent:** 3000 ha  $\pm$ 30% or 9%  $\pm$  60% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Gellie (2005) estimates that 11% of this community remains (about 2000 ha) for the area he modelled which is less than one third of its range. Only 6% of this community remains in Little River Catchment. Only 671 ha remains in Boorowa Shire.

**Conservation Reserves:** Ellerslie NR 120 (E1); Woomargama NP 11 (E1); Bogandyera NR 10 (E4); Livingstone NP 10 (E3).

**Reserves Total Area:** 151 ha.

**No. Representatives in Reserves:** 4

**Protected Area Explanation:** Ellerslie NR (including 2006 acquired land), Woomargamba NP areas from vegetation group 12 in Gellie & Fanning (2004). Mentioned in EcoGIS (2005) as being in Bogandyera NR but not substantiated. A similar community is in Numerella NR on the tablelands. Livingstone NP estimate from observations in Benson (1999-2009).

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 5.03% 151 ha  $\pm$  50%.

**No. Representatives in Protected Areas:** 4

**Protected Pre-European Extent:** 0.43% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Requires investigation. Scattered across the NSW south-western slopes but it is difficult to find areas in good condition due to its location along river flats and low slopes which are highly cleared and disturbed.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Contains a similar understorey to other grassy box woodlands in southern New South Wales. Understorey species range with altitude and substrate and with distance from creeklines. Sedges may dominate wet areas.

**Fire Regime:** Pre-European fire regime unknown but may have been pathily burnt by Aborigines. Fire is now relatively infrequent 10-30 years. Fire may be important as a means to reduce Nitrogen levels that favour the dominance of exotic annual species.

**Adjoining Communities:** Grades into ID278 Blakely's Red Gum riparian open forest and into ID277 Blakely's Red Gum - Yellow Box woodland on clay - loam soils on hills and slopes and into stringybark (*Eucalyptus macroryncha*) woodland on poorer soils on higher slopes and ridges. Similar to ID275 White Box - Apple Box riparian woodland and ID298 Norton's Box - Apple Box open forest on the southern upper SW slopes.

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Clearing on small lots (hobby farms); Disease and/or dieback (abnormal); Dryland cropping; Firewood collection; Chemical pollution (incl. herbicides, pesticides); Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: gully, tunnel, landslips; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 4; 1.

**Planning Controls:**

**Planning and Management:** Protect remnants in protected areas and under property plans. Regenerate some creeklines and flats. Weed programs are required in some areas.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (177; 308; 183; 340; 276; 350; 336; 353; 356). Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Seddon, J., Briggs, S. & Doyle, S. (2002) Little River Catchment biodiversity assessment. Report. (NSW National Parks and Wildlife Service c/- CSIRO Sustainable Ecosystems: Canberra); EcoGIS (2005) Vegetation of the Upper Murray reserves: Report to NSW Department of Environment and Conservation (DEC Upper Murray Area, Snowy Mountains Region: Khancoban); NSW National Parks and Wildlife Service (2002a) The native vegetation of Boorowa Shire (NSW National Parks and Wildlife Service: Hurstville); Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254; Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan.



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 312

**Common Name:** Yellow Box grassy tall woodland on valley flats in the upper slopes of the South-western Slopes Bioregion and South Eastern Highlands Bioregion

**Scientific Name:** *Eucalyptus melliodora* / *Acacia dealbata* - *Hibbertia obtusifolia* / *Austrodanthonia racemosa* var. *racemosa* - *Microlaena stipoides* var. *stipoides* - *Carex inversa* - *Senecio quadridentatus*

**Veg. Comm. ID.:** 312 **Original Entry:** J.S. Benson 26/03/2007

**Photo 1:** ID312a\_DX28629.jpg Yellow Box (*Eucalyptus melliodora*) tall woodland with an altered grassy ground cover along the lower reaches of Tumberumba Creek in the upper Murray River region, [AGD66 35°53.380'S 148°03.439'E], 5/5/2006, Jaime Plaza.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Eucalyptus melliodora*.

**Shrubs/Vines/Epiphytes:** *Acacia dealbata*; *Hibbertia obtusifolia*; *Cassinia longifolia*.

**Ground Cover:** *Austrodanthonia racemosa* var. *racemosa*; *Microlaena stipoides* var. *stipoides*; *Carex inversa*; *Bulbine bulbosa*; *Senecio quadridentatus*; *Austrostipa scabra* subsp. *falcata*; *Themeda australis*; *Dichelachne micrantha*; *Poa sieberiana*; *Austrodanthonia penicillata*; *Austrodanthonia pilosa*; *Senecio bathurstianus*; *Desmodium brachypodium*; *Vittadinia cuneata* var. *cuneata* f. *cuneata*; *Wahlenbergia communis*; *Wahlenbergia gracilis*; *Wurmbea dioica* subsp. *dioica*; *Desmodium varians*; *Cheilanthes austrotenuifolia*; *Gonocarpus tetragynus*; *Lomandra filiformis* subsp. *coriacea*; *Oxalis perennans*.

**Weed Species:** *Rubus discolor*; *Hypericum perforatum*; many species of exotic grasses.

**Weediness:** Very high (>30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Forest.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland or open forest dominated by Yellow Box (*Eucalyptus melliodora*) and generally lacking Blakey's Red Gum (*Eucalyptus blakelyi*). The shrub layer is very sparse or absent and if present may include *Acacia dealbata* or *Hibbertia obtusifolia*. The ground cover is mid-dense to dense and often dominated by grass species such as *Austrodanthonia racemosa* var. *racemosa*, *Poa sieberiana*, *Microlaena stipoides*, *Themeda australis*, *Austrostipa scabra* subsp. *falcata* and *Dichelachne micrantha*. Forbs include *Bulbine bulbosa*, *Senecio quadridentatus*, *Senecio bathurstianus*, *Vittadinia cuneata* var. *cuneata*, *Wahlenbergia communis*, *Wahlenbergia gracilis* and *Wurmbea dioica* subsp. *dioica*. The climbers *Desmodium brachypodium* and *Desmodium varians* may occur. Occurs on either orange-brown deep podzolic soils derived from granite or brown loam-clays derived from metasediments or sedimentary rocks in valley floors and on footslopes slopes in the upper slopes sub-region of the NSW South Wales South-western Slopes Bioregion. Grades into a western lower slopes similar community to the west (ID276). This community is mostly cleared and the ground cover is often dominated by exotic species. It is a critically endangered community.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** Eucalyptus (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Southern Tableland Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus forests with a grassy understorey.

**Forest Type (RN 17):** 171 - Yellow Box (P).

**Authority(s):** (Quantitative Data). Similar to Vegetation Group 161 in Gellie (2005) and includes Vegetation Group 25 for upper Murray River region in EcoGIS (2005). Minor part of vegetation group 23 in Gellie & Fanning (2004). Observed over range by Benson (1999-2009). Similar in structure and tree species to ID276 that occurs to the west of this community. Floristically similar to the widespread broadly classified ID277. Limited data limited as of 2007.

**Interstate Equivalent(s):** Victoria: probably part of EVC188 Plains Grassy Woodland / Valley Grassy Forest Complex.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Modelled as Vegetation Group 161 by Gellie (2005) for its central range. Mapped in reserves in the upper Murray region in EcoGIS (2005). Would require fine-scale mapping to map out this community from ID277 and other similar communities.

**Climate Zone:** Montane: no dry season (mild summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); South Eastern Highlands (30-70%).

**IBRA Sub-Region:** Upper Slopes (30-70%); Bondo (30-70%); Murrumbateman (1-30%).

**Botanical Division:** South Western Slopes (SWS) (30-70%); Southern Tablelands (ST) (30-70%).

**Local Govt. Areas:** Tumut (1-30%); Tumbarumba (30-70%); Yass Valley (1-30%).

**CMAs:** Murrumbidgee (30-70%); Murray (30-70%).

**MD Basin:** Yes.

**Substrate Mass:** Colluvium; Plutonic rocks; Metamorphic rocks.

**Lithology:** Colluvial sediments; Granite; Metamorphic rock (unidentified).

**Great Soil Group:** Brown podzolic soil; Red podzolic soil.

**Soil Texture:** Clay loam; Light clay; Medium clay.

**Landform Patterns:** Hills.

**Landform Elements:** Foothills; Valley flat.

**Land Use:** Grazing.

**Impacts of European Settlement:** Dieback due to disease or senescence; Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 40000 ha  $\pm$ 30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Gellie (2005) (Vegetation Group 161) estimated 87,000 ha may have occurred but this is imprecise and may include the widely distributed ID277.

**Current Extent:** 3000 ha  $\pm$ 30% or 8%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Small patches with intact ground cover remain. Gellie maps 3800 ha remaining. Areas of isolated trees remain but the ground cover tends to be dominated by exotic pasture species.

**Conservation Reserves:** Bogandyera NR 97 (M); Woomargama NP 50 (E4).

**Reserves Total Area:** 147 ha.

**No. Representatives in Reserves:** 2

**Protected Area Explanation:** Bogandyera NR from EcoGIS (2005) that also mentions with community is in Woomargama NP where an estimate is split off from the ID277 occurrence in that reserve. Occurrences in reserves in the SE Highlands Bioregion may increase proportion protected.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 4.9% 147 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 2

**Protected Pre-European Extent:** 0.36% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** In the north it occurs in valleys in the Yass region. It also occurs along Tumbarumba Creek and other tributaries of the upper Murray River.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** The understorey species would vary over range from north to south but the basic structure and canopy species are consistent.

**Fire Regime:** Unknown. May originally have been subject to regular patch burns by Aborigines but now highly fragmented and rarely burns. Some landholders may burn off the ground cover from time to time.

**Adjoining Communities:** Grades into the widespread Yellow Box - Blakely's Red Gum woodland (ID277) in valleys and slopes and into Norton's Box - Red Stringybark open forests upslope in the upper Murray region. Grades into a similar alluvial and parna Yellow Box woodland (ID276) on the lower slopes of the NSW South-western slopes Bioregion.

**Threatening Processes:** Mostly cleared and weed infested. Further clearing for agriculture or pine plantation may threaten some remaining stands. Over grazing is preventing regeneration of trees in most locations.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Clearing for pine plantations; Nutrient changes through fertilizers or runoff; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Prevent further clearing of this community. Active management, including weeding, is required to allow regeneration of remnants on private land. Part of Grassy White Box - Yellow Box listed EEC.

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box - Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

Friday, 27 January 2012

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**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (308; 350; 340). Benson, J.S. (1999-2006) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); EcoGIS (2005) Vegetation of the Upper Murray reserves: Report to NSW Department of Environment and Conservation (DEC Upper Murray Area, Snowy Mountains Region: Khancoban); Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan.



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 266

**Common Name:** White Box grassy woodland in the upper slopes sub-region of the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus albens* / *Acacia decora* - *Acacia implexa* - *Acacia deanei* subsp. *paucijuga* / *Themeda australis* - *Poa sieberiana* - *Wurmbea dioica* - *Cymbonotus lawsonianus*

**Veg. Comm. ID.:** 266 **Original Entry:** J. S. Benson 10/01/2006

**Photo 1:** ID266a\_PC178-22.jpg *Eucalyptus albens* grassy woodland, Quamby-Thuddungra TSR south of Grenfell, [AGD66 34°09'28"S 148°08'39"E], 12/10/02, Jaime Plaza.



**Photo 2:** ID266b\_PC172-12.jpg *Eucalyptus albens* - *Themeda australis* grassy woodland, Canowindra Cemetery, [AGD66 33°32'59"S 148°40'17"E], 10/10/02, Jaime Plaza.



**Photo 3:** ID266c\_PC193-12.jpg *Eucalyptus albens* grassy woodland, Minjary National Park, [AGD66 35°13'18"S 148°07'20"E], 16/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus albens*; *Brachychiton populneus* subsp. *populneus*; *Eucalyptus blakelyi*; *Eucalyptus bridgesiana*; *Eucalyptus melliodora*.

**Shrubs/Vines/Epiphytes:** *Acacia decora*; *Acacia implexa*; *Acacia deanei* subsp. *paucijuga*; *Acacia genistifolia*; *Acacia penninervis* var. *penninervis*; *Acacia buxifolia* subsp. *buxifolia*; *Acacia paradoxa*; *Dodonaea viscosa* subsp. *cuneata*; *Bursaria spinosa* subsp. *spinosa*; *Cassinia aculeata*; *Hibbertia riparia*.

**Ground Cover:** *Themeda australis*; *Poa sieberiana*; *Wurmbea dioica*; *Cymbonotus lawsonianus*; *Aristida behriana*; *Panicum effusum*; *Austrodanthonia auriculata*; *Austrodanthonia caespitosa*; *Microlaena stipoides*; *Austrostipa bigeniculata*; *Bothriochloa macra*; *Elymus scaber* var. *scaber*; *Aristida ramosa*; *Enteropogon acicularis*; *Austrostipa aristiglumis*; *Austrodanthonia monticola*; *Gonocarpus elatus*; *Oxalis perennans*; *Lomandra filiformis* subsp. *coriacea*; *Lomandra multiflora*; *Dianella longifolia*; *Tricoryne elatior*; *Desmodium varians*; *Hydrocotyle laxiflora*; *Asperula conferta*; *Leptorhynchus squamatus*; *Craspedia variabilis*; *Podolepis jaceoides*; *Stackhousia monogyna*; *Dichopogon strictus*; *Velleia paradoxa*; *Diuris dendrobioides*; *Microtis unifolia*; *Cheilanthes sieberi* subsp. *sieberi*; *Acaena novae-zelandiae*; *Acaena ovina*; *Ajuga australis*; *Xerochrysum viscosum*; *Vittadinia cuneata*; *Wahlenbergia luteola*; *Solenogyne dominii*; *Scutellaria humilis*; *Ranunculus lappaceus*; *Rumex brownii*; *Plantago varia*; *Hypericum gramineum*; *Chrysocephalum apiculatum*; *Chloris truncata*; *Calotis cuneata* var. *cuneata*; *Glycine clandestina*; *Calotis lappulacea*; *Microseris lanceolata*; *Geranium retrorsum*; *Goodenia pinnatifida*; *Microseris lanceolata*; *Eryngium ovinum*; *Prasophyllum odoratum*; *Diuris dendrobioides*.

**Weed Species:** *Hypochaeris radicata*; *Bromus hordeaceus*; *Vulpia muralis*; *Vulpia myuros*; *Avena fatua*; *Echium plantagineum*; *Trifolium campestre*; *Trifolium arvense*; *Plantago lanceolata*; *Phalaris aquatica*; *Carthamus lanatus*; *Lolium perenne*; *Dactylis glomerata*; *Anagallis arvensis*; *Briza minor*.

**Weediness:** Very high (>30%) with >30% cover.

**Threatened Plants:** *Microseris lanceolata* (depleted).

**Threatened Fauna:** Superb Parrot; Swift Parrot; Brown Treecreeper; Diamond Firetail; Pale-headed Snake; Striped Legless Lizard.

**Mean Species Richness:** In good sites over 40 spp. in 20 X 20 m plots but such sites are rare..

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland with trees to 25 m high dominated by White Box (*Eucalyptus albens*) often as the only tree species. Kurrajong (*Brachychiton populneus* subsp. *populneus*) is often present, particularly on limestone or rocky ground. *Eucalyptus bridgesiana* or *Eucalyptus blakelyi* or *Eucalyptus melliodora* may also be present as minor components of the canopy. The shrub layer is usually sparse or absent depending on grazing history or soil type. Wattles are common shrubs including *Acacia decora*, *Acacia implexa*, *Acacia pycnantha*, *Acacia deanei* subsp. *paucijuga*, *Acacia genistifolia*, *Acacia penninervis* var. *penninervis*, *Acacia buxifolia* subsp. *buxifolia* and *Acacia paradoxa*. Other shrubs include *Dodonaea viscosa* subsp. *cuneata*, *Bursaria spinosa* subsp. *spinosa* and *Cassinia* spp. The ground cover is usually mid-dense to dense except during drought and may be very diverse in grass and forb species. Very few areas contain a native ground cover with a rich flora but where this occurs it typically contains grasses such as *Themeda australis*, *Poa sieberiana*, *Elymus scaber* var. *scaber* and a range of *Austrodanthonia* species including *Monachather paradoxus* and *Austrodanthonia auriculata*. Forbs in such sites include *Wurmbea dioica*, *Gonocarpus elatus*, *Microseris lanceolata*, *Leptorhynchus squamatus*, *Craspedia variabilis*, *Podolepis jaceoides*, *Hypericum gramineum*, *Stackhousia monogyna*, *Ranunculus lappaceus*, *Dichopogon strictus*, *Velleia paradoxa* and *Diuris dendrobioides*. In heavily grazed sites fewer native species are present and the sites are dominated by *Austrostipa* spp., *Aristida* spp. and *Austrodanthonia* spp. Grasses with some hardy forbs such as *Calotis* spp., *Xerochrysum viscosum*, *Vittadinia cuneata*, *Wahlenbergia luteola*, *Solenogyne dominii*, *Scutellaria humilis* and *Oxalis perennans*. In sites exposed to continuous grazing, soil disturbance and fertilizer application, exotic species dominate the ground cover including *Bromus* spp., *Vulpia* spp., *Avena fatua*, *Echium plantagineum*, *Trifolium* spp. and *Plantago lanceolata*. Floristic composition varies from north to south and on different aspects and soil types. Occurs between 300 - 600 m altitude in the 500 - 700 mm rainfall zone, most of which falls in winter. The soils are mainly red-brown earths, red or yellow podsols with some brown and black earths. The soils are derived from a variety of lithologies including shale, limestone, fine grained metamorphic rocks, granite and basalt. Species composition appears not to vary greatly across these lithologies. Mainly occurs on hillslopes in low hill or hill landform patterns in the NSW South-western Slopes Bioregion overlapping into the South Eastern Highlands Bioregion. Most of this community has been cleared and most of the extent of ground cover has been replaced by exotic annual plant species. Sheet erosion has led to top soil loss on heavily grazed slopes. Small areas with an "intact" ground cover remain in cemeteries, roadsides and travelling stock reserves. While this community is poorly sampled in public reserves, some progress is being made in protecting remnants in non-reserve conservation measures. A highly threatened plant community due to ground cover change and clearing.

**Level of Classification:** Alliance / Sub-formation.

**Classification Confidence Level:** High.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 175 - White Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes most of the White Box association in Moore (1953a). Includes Vegetation Group 31 in Gellie & Fanning (2004) and Vegetation Group 117 in Gellie (2005). Community 3 in Priday (2004) for Wagga Wagga Shire. Part of Biolandscapes BuLS24 and SouV24 in Priday (2006). White Box woodland in Boorowa Shire (NSWNPWS 2002a). Community 74 (*Eucalyptus albens*) in Austin (2001) for mid-Lachlan region. Probably most of the White Box woodland in Sedden et al. (2002) for the Little River Catchment. Much of the White Box community in Prober (1996) and Prober & Thiele (1995) Includes BVT78 in DEC (2006, 2006a). A sub-formation that could be sub-divided with plot data analysis.

**Interstate Equivalent(s):** Victoria: part of EVC 175-62 Rainshadow Grassy Woodland.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Full range not mapped as of 2007. Mapped by Priday (2004) in Wagga Wagga Shire. Mapped in the Boorowa and Yass Shires and in some reserves. Difficult to discern a native understorey from an exotic understorey using aerial photos.

**Climate Zone:** Temperate: no dry season (warm summer); Temperate: no dry season (hot summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%); South Eastern Highlands (1-30%).

**IBRA Sub-Region:** Bondo (1-30%); Crookwell (1-30%); Lower Slopes (1-30%); Orange (1-30%); Upper Slopes (30-70%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%); South Western Slopes (SWS) (30-70%).

**Local Govt. Areas:** Albury (1-30%); Bland (1-30%); Boorowa (1-30%); Cabonne (1-30%); Coolamon (1-30%); Cootamundra (1-30%); Cowra (1-30%); Forbes (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Junee (1-30%); Parkes (1-30%); Temora (1-30%); Wagga Wagga (1-30%); Weddin (1-30%); Wellington (1-30%); Young (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.



**Substrate Mass:** Volcanic rocks; Metamorphic rocks; Sedimentary rocks; Plutonic rocks.

**Lithology:** Basalt; Calcareous mudstone; Claystone; Granite; Hornfels; Jasper; Limestone; Mudstone; Phyllite; Schist; Shale; Slate.

**Great Soil Group:** Black earth; Chocolate soil; Red podzolic soil; Red-brown earth.

**Soil Texture:** Clay loam; Light clay; Light medium clay; Medium clay.

**Landform Patterns:** Hills; Low hills.

**Landform Elements:** Hillcrest; Hillslope; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 800000 ha ±30%. Estimated from pre-European map: part range.

**Pre-European Extent Comments:** Moore (1953a) mapped 1.1 million ha of pre-European White Box woodland from Young to Albury on the NSW south western slopes but this broad map includes several types of White Box woodland. However, this did not cover the northern extent of this community.

**Current Extent:** 50000 ha ±30% or 6% ± 50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Miniscule White Box woodland remains with a native ground cover but White Box paddock trees are common mostly with a weedy ground cover. The current extent estimate depends on whether one is recording "intactness of ground cover" or tree patch cover. Prober & Thiele (1993) state that only 0.01% of White Box woodland south of Molong remains relatively unmodified. NSWNPWS map 5584 of a predicted 30511 ha (18%) of White Box woodland in Boorowa Shire but this includes paddock patches. Seddon et al. (2002) estimate only 3% remains in the Little River Catchment.

**Conservation Reserves:** Flagstaff Memorial NR 6 (E2); Barton NR 6 (M); Minjary NP 30 (E3); Oak Creek NR 100 (E3); Tumblong SCA 18 (E1); Ellerslie NR 300 (E3).

**Reserves Total Area:** 460 ha.

**No. Representatives in Reserves:** 6

**Protected Area Explanation:** Flagstaff Memorial NR from Brickhill (1978a). Barton NR from White Box woodland in Lembit & Skelton (1998). VCA116 and VCA111 from DEC file notes. Oak Creek NR and Minjary NP and from vegetation group 31 in Gellie & Fanning (2004). HE9901 and WT9902 from DNR database. Ellerslie NR and Tumblong SCA from ADS-40 mapping (DECC South 2010).

**Secure Property Agreements:** VCA116 Marra Cemetery VCA 4 (M); VCA111 Wallendbeen Cemetery VCA 3 (E1); HE9901 PA 6 (E2); WT9908 PA 64 (E2).

**Secure PAs Total Area:** 77 ha.

**No. Representatives in Secure Property Agreements:** 4

**Protected Current Extent:** 1.07% 537 ha ± 30%.

**No. Representatives in Protected Areas:** 10

**Protected Pre-European Extent:** 0.06% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Some travelling stock routes, cemeteries and roadsides contain good condition grassy White Box woodland. These include Guise's Hill TSR and Mangoplah Landcare site in Wagga Shire (Priday 2004), Warraderry Range in the Lachlan Catchment, Hovell's Creek and Bennet Springs TSRs in Boorowa Shire.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Occurs over a large range on many lithologies and a number of soil types. Floristic composition varies but Prober (1996) describes consistency in ground cover species composition with a gradual latitudinal change from south to northern NSW.

**Fire Regime:** Aboriginal burning of grassy woodlands favoured grasses such as Themeda australis and native yam (Microseris lanceolata). An appropriate fire regime may be 3-15 years. Fire is rare due to fragmentation and lack of ground cover due to grazing. The prevalence of an exotic, annual ground flora has changed the fire regimes. Burning could decrease exotic annual species by flushing soil nitrogen.

**Adjoining Communities:** Grades into and shares many ground species with Blakely's Red Gum - Yellow Box woodland (ID277) on lower slopes and flats; into Fuzzy Box (Eucalyptus conica) woodland (ID201) on colluvial lower slopes and flats; to the west into Western Grey Box (Eucalyptus microcarpa) woodland (ID76 or ID80) on brown loams and clays and into shrubby White Box or Tumbledown Red Gum - Mugga Ironbark - Red Stringybark communities on steep hills.

**Threatening Processes:** Highly fragmented due to clearing. High nitrogen levels due to fertilizer use, coinciding with the introduction of exotic pasture weeds replacing perennial native grasses and forbs. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Dryland cropping; Chemical pollution (incl. herbicides, pesticides); Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: sheet erosion; Soil erosion, wind; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002). Prevent travelling stock routes from being sold off or overgrazed. Protect key sites in public conservation reserves. Off-reserve measures such as the Grassy Woodlands Conservation Management Network can protect sites in good condition on private land. Management of remnants may require regular burning or mowing to remove nutrients and annual species and stimulate reproduction of native forbs and grasses.

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box - Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (183; 166; 336; 316; 338; 276; 338; 343; 301; 179; 340; 348; 340; 356; 353; 372; 373). Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; NSW National Parks and Wildlife Service (2002a) The native vegetation of Boorowa Shire (NSW National Parks and Wildlife Service: Hurstville); Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Prober, S. (1996) Conservation of the grassy White Box woodlands: rangewide floristic variation and implications for reserve design. Aust. J. Botany 44: 57-77; Seddon, J., Briggs, S. & Doyle, S. (2002) Little River Catchment biodiversity assessment. Report. (NSW National Parks and Wildlife Service c/- CSIRO Sustainable Ecosystems: Canberra); Prober, S. (1996) Conservation of the grassy White Box woodlands: rangewide floristic variation and implications for reserve design. Aust. J. Botany 44: 57-77; Prober, S.M. & Thiele, K.R. (1995) Conservation of the grassy White Box woodlands: relative contributions of size and disturbance to floristic composition and diversity of remnants. Aust. J. Bot. 43: 349-366; Brickhill, J. (1978a) Information sheet on Flagstaff Memorial



Nature Reserve. RN 39. (NSW National Parks and Wildlife Service: Griffith); Lembit, R. & Skelton, N. (1998) Vegetation survey of Copperhanna, Barton, Dapper and Boginderra Hills Nature Reserves. Report to the NSW National Parks and Wildlife Service: Central West; Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Lambert, J. & Elix, J. (2002) Grassy White Box woodlands information kit (Community Solutions: Sydney); Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Priday, S. (in prep. 2006) The native vegetation of the New South Wales South-western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 267

**Common Name:** White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus albens* - *Eucalyptus microcarpa* - *Callitris glaucophylla* / *Acacia decora* - *Acacia hakeoides* - *Dodonaea viscosa* subsp. *cuneata* - *Maireana microphylla* / *Austrostipa densiflora* - *Austrodanthonia caespitosa* - *Chrysocephalum apiculatum* - *Lomandra filiformis* subsp. *coriacea*

**Veg. Comm. ID.:** 267 **Original Entry:** J. S. Benson 10/01/2006

**Photo 1:** ID267a\_PC247-7.jpg *Eucalyptus albens* - *Callitris glaucophylla* open forest on a low hill on Backgamma Road, near Parkes, [AGD66 33°17'13.8"S 148°15'47.1"E], 03/05/2005, Jaime Plaza.



**Photo 2:** ID267b\_benson.jpg *Eucalyptus albens* with *Callitris glaucophylla* on red parna soils, roadside south of Temora, lower slopes sub-region of NSW SWS Bioregion, February 2007, J.S. Benson.



**Photo 3:** ID267c\_PC253-24.jpg *Eucalyptus albens* - *Callitris glaucophylla* woodland, Tanners Spring Road, [AGD66 32°33'50"S 148°21'55.9"E], 5/05/2005, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus albens*; *Callitris glaucophylla*; *Eucalyptus microcarpa*; *Callitris endlicheri*; *Allocasuarina luehmannii*; *Eucalyptus melliodora*.

**Shrubs/Vines/Epiphytes:** *Acacia decora*; *Acacia hakeoides*; *Dodonaea viscosa* subsp. *cuneata*; *Maireana microphylla*; *Myoporum montanum*; *Pittosporum angustifolium*; *Senna artemisioides*; *Acacia pycnantha*; *Acacia deanei* subsp. *paucijuga*; *Acacia implexa*; *Acacia paradoxa*; *Acacia verniciflua*; *Acacia acinacea*; *Eremophila longifolia*; *Senna form* taxon 'artemisioides'; *Indigofera australis*; *Cassinia aculeata*; *Grevillea floribunda*; *Geijera parviflora*; *Indigofera australis*; *Maireana enchylaenoides*.

**Ground Cover:** *Austrostipa densiflora*; *Austrodanthonia caespitosa*; *Chrysocephalum apiculatum*; *Lomandra filiformis* subsp. *coriacea*; *Xerochrysum viscosum*; *Dianella revoluta*; *Sida corrugata*; *Lomandra multiflora*; *Dichopogon strictus*; *Hydrocotyle laxiflora*; *Chenopodium desertorum* subsp. *desertorum*; *Plantago varia*; *Einadia nutans* subsp. *nutans*; *Brachyscome multifida* var. *multifida*; *Podolepis jaceoides*; *Vittadinia cuneata* var. *cuneata* f. *cuneata*; *Einadia hastata*; *Wahlenbergia communis*; *Wahlenbergia luteola*; *Atriplex semibaccata*; *Glycine tabacina*; *Glycine clandestina*; *Goodenia pinnatifida*; *Asperula conferta*; *Eremophila debilis*; *Bothriochloa macra*; *Austrostipa verticillata*; *Austrostipa bigeniculata*; *Cymbopogon refractus*; *Chloris truncata*; *Austrostipa scabra* subsp. *scabra*; *Enteropogon acicularis*.

**Weed Species:** *Echium plantagineum*; *Vulpia bromoides*; *Vulpia muralis*; *Hypochaeris radicata*; (and may others).

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Swift Parrot; Grey-crowned Babbler.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Woodland.

**Height Class (WH):** Mid-High; Tall.

**Vegetation Description:** Tall or mid-high woodland or open woodland with trees to about 15 m high dominated by White Box (*Eucalyptus albens*), White Cypress Pine (*Callitris glaucophylla*) and often Western Grey Box (*Eucalyptus microcarpa*) and rarely Black Cypress Pine (*Callitris endlicheri*). The shrub layer is sparse containing wattles such as *Acacia decora*, *Acacia hakeoides*, *Acacia deanei* subsp. *paucijuga*, *Acacia implexa* and in the south *Acacia pycnantha*. Other shrubs include *Dodonaea viscosa* subsp. *cuneata*, *Myoporum montanum*, *Pittosporum angustifolium*, *Senna artemisioides*, *Maireana enchylaenoides* and *Maireana microphylla*. The ground cover is mid-dense to very sparse depending on rainfall. It may contain the decumbent shrubs *Eremophila debilis*. Grass species include *Austrostipa densiflora*, *Austrostipa bigeniculata*, *Austrostipa verticillata*, *Austrodanthonia caespitosa*, *Themeda australis*, *Enteropogon acicularis* and *Bothriochloa macra*. Forb species include *Xerochrysum viscosum*, *Dianella revoluta*, *Dichopogon strictus*, *Chrysocephalum apiculatum*, *Hydrocotyle laxiflora*, *Podolepis jaceoides*, *Vittadinia cuneata*, *Wahlenbergia luteola*, *Einadia hastata*, *Einadia nutans*, *Plantago varia* and *Atriplex semibaccata*. The mat-rushes *Lomandra multiflora* and *Lomandra filiformis* subsp. *coriacea* may be present. Weeds dominate disturbed locations. Occurs on red-brown loamy soils or loamy sandy soils derived from sedimentary or volcanic rocks on hillslopes and hillcrests or parna soils on low rises in undulating low hills landscapes in the mid-western part of the NSW South-western Slopes Bioregion. Contains elements of White Box woodland on the slopes (e.g. ID266), White Cypress Pine woodland (ID70) and Western Grey Box woodlands on the plains (ID76 and ID80). Mostly cleared with remnant stands affected by heavy grazing and weed invasion.

**Level of Classification:** Association.

**Classification Confidence Level:** Low.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 175 - White Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Probably includes the White Box - White Cypress Pine association in Moore (1953a). Includes the White Box - White Cypress Pine - Grey Box woodland and part of the Wagga Wagga Hills Open Forest map units in Priday (2004) for Wagga Wagga Shire. Probably includes Biolandscapes Eas25c, EasR53a, BulS53b and UlaV25b in Priday (2006). Probably includes community 75 (*Eucalyptus albens* - *E. microcarpa*) in Austin et al. for Lachlan River catchment. Probably the White Cypress Pine - White Box unit in MLVMP (1999). Grey Box - White Box community in the Urangeline region in Stelling (1998). Part of BVTs 19 or 77 in DEC (2006, 2006a).

**Interstate Equivalent(s):** Victoria: similar to EVC187 Plains Woodland or EVC 175-62 Rainshadow Grassy Woodland.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Priday (2004) models and maps this community for the Wagga Wagga Shire. Mapped in several biolandscapes in Priday (2006). Observed in other regions but as of 2007 not mapped throughout its range.

**Climate Zone:** Temperate: no dry season (hot summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Lower Slopes (30-70%); Upper Slopes (1-30%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%); South Western Slopes (SWS) (1-30%).

**Local Govt. Areas:** Bland (1-30%); Cabonne (1-30%); Coolamon (1-30%); Dubbo (1-30%); Forbes (1-30%); Junee (1-30%); Lockhart (1-30%); Parkes (1-30%); Temora (1-30%); Wagga Wagga (1-30%); Weddin (1-30%); Wellington (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Colluvium; Metamorphic rocks; Parna; Sedimentary rocks.

**Lithology:** Colluvial sediments; Conglomerate; Metamorphic rock (unidentified); Mudstone; Shale.

**Great Soil Group:** Brown earth; Red clay; Red earth.

**Soil Texture:** Clay loam; Clay loam, sandy; Light clay.

**Landform Patterns:** Low hills; Rises.

**Landform Elements:** Footslope; Hillslope.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.



**Pre-European Extent:** 70000 ha ±50%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate based on landscape position - mainly in mid-western areas of the NSW SW Slopes Bioregion.

**Current Extent:** 8000 ha ±50% or 11% ± 70% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Mostly cleared. Priday (2004) notes this community has restricted distribution compared to the more general White Box woodland (ID266) on the NSW SW slopes.

**Conservation Reserves:** Wiesners Swamp NR 10 (E1).

**Reserves Total Area:** 10 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Wiesners Swamp NR area from its plan of management and Benson (1999-2009). VCA038 from DEC NSW file notes.

**Secure Property Agreements:** VCA038 VCA 3 (M).

**No. Representatives in Secure Property Agreements:** 1

**Secure PAs Total Area:** 3 ha.

**Protected Current Extent:** 0.16% 13 ha ± 10%.

**No. Representatives in Protected Areas:** 2

**Protected Pre-European Extent:** 0.01% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Requires survey. A remnant lines the lane north of Weisners Swamp NR. Some sites occur along the Wagga Wagga - Coolamon Road, Olympic Highway and nearby railway reserves and further north near Backyabba State forest near Parkes. Also, north-east of Stockinbingal.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Unknown.

**Fire Regime:** Prior to European settlement, there may have been regular patch burning of grassy woodlands by Aborigines - the frequency and extent of which is debatable. An appropriate fire regime may have been 3-10 years but patchy with the occasional wildfire. Fire is now limited by fragmentation due to clearing and lack of ground cover due to grazing. The prevalence of an annual ground flora in many locations may also have changed the intensity of fire compare to pre-European times.

**Adjoining Communities:** Situated between ID266 White Box grassy woodland on red and yellow podzolic soils in hilly country to the east and ID76s and 80 (Western Grey Box woodlands) to the west. Grades into Blakey's Red Gum - River Red Gum communities on alluvium along watercourses. A similar community occurs in the BBS Bioregion to the north (ID435).

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. A key threat is the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a natural shrub or ground cover native plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Dryland cropping; Chemical pollution (incl. herbicides, pesticides); Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Protect all TSRs and roadsides containing this community. Protect remnants on private land under secure property agreements. Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002).

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakey's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box-Yellow Box-Blakey's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (308; 316; 341; 183; 166; 67; 356; 372; 373). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Stelling, F. (Ed.) (1998) South West Slopes Revegetation Guide (Murray Catchment Management Committee and Department of Land & Water Conservation: Albury); Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 268

**Common Name:** White Box - Blakely's Red Gum - Long-leaved Box - Norton's Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the New South Wales South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus albens* - *Eucalyptus blakelyi* - *Eucalyptus goniocalyx* - *Eucalyptus macrorhyncha* / *Acacia genistifolia* - *Lissanthe strigosa* subsp. *strigosa* - *Dillwynia sericea* - *Acacia implexa* / *Dianella revoluta* var. *revoluta* - *Lomandra filiformis* subsp. *coriacea* - *Austrodanthonia eriantha* - *Microlaena stipoides* var. *stipoides*

**Veg. Comm. ID.:** 268 **Original Entry:** J. S. Benson 31/12/2005

**Photo 1:** ID268a\_PC207-2.jpg *Eucalyptus albens* - *E. blakelyi* - *E. macrorhyncha* shrubby hillslope woodland in Ellerslie Nature Reserve, [AGD66 35°13'34"S 147°52'13"E], 20/10/02, Jaime Plaza.



**Photo 2:** ID268b\_SWS0507002.jpg White Box (*Eucalyptus albens*) open forest with Red Stringybark (*Eucalyptus macrorhyncha*), Blakely's Red Gum (*Eucalyptus blakelyi*) and the shrub *Acacia genistifolia* in Wyangala State Recreation Area, [AGD66 33°54.149'S 149°00.117'E], 1/6/2007, Jaime Plaza.



**Photo 3:** ID268c\_benson.jpg Blakely's Red Gum - White Box - Norton's Box - Red Stringybark woodland with altered ground cover on a hill near Jindera, 30 km north of Albury, 7/2/2008, J.S. Benson.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus albens*; *Eucalyptus polyanthemos*; *Eucalyptus blakelyi*; *Eucalyptus macrorhyncha*; *Eucalyptus sideroxyton*; *Eucalyptus goniocalyx*; *Eucalyptus nortonii*.

**Shrubs/Vines/Epiphytes:** *Acacia implexa*; *Acacia genistifolia*; *Dillwynia sericea*; *Lissanthe strigosa* subsp. *strigosa*; *Acacia decora*; *Bursaria spinosa* subsp. *spinosa*; *Daviesia latifolia*; *Melichrus urceolatus*; *Acacia paradoxa*; *Hibbertia obtusifolia*; *Hibbertia riparia*; *Persoonia rigida*; *Pultenaea lapidosa*; *Leucopogon virgatus*; *Xanthorrhoea glauca*.

**Ground Cover:** *Dianella revoluta* var. *revoluta*; *Lomandra filiformis* subsp. *coriacea*; *Austrodanthonia eriantha*; *Microlaena stipoides* var. *stipoides*; *Hydrocotyle laxiflora*; *Solenogyne dominii*; *Acaena ovina*; *Themeda australis*, *Joycea pallida*; *Poa sieberiana*; *Elymus scaber* var. *scaber*; *Aristida ramosa*; *Schoenus apogon*; *Carex breviculmis*; *Carex inversa*; *Luzula densiflora*; *Gonocarpus tetragynus*, *Geranium solanderi* var. *solanderi*; *Cheilanthes sieberi* subsp. *sieberi*; *Ammobium craspedioides*; *Bulbine bulbosa*; *Lomandra multiflora*; *Juncus filicaulis*; *Carex inversa*; *Austrostipa densiflora*; *Austrodanthonia caespitosa*; *Echinopogon ovatus*; *Acaena novae-zelandiae*; *Rumex brownii*; *Senecio prenanthoides*; *Veronica plebeia*; *Galium propinquum*; *Stellaria pungens*; *Echinopogon ovatus*; *Xerochrysum viscosum*; *Xerochrysum bracteatum*; *Euchiton gymnocephalus*; *Senecio quadridentatus*; *Pratia purpurascens*; *Dichondra repens*; *Hypericum gramineum*; *Juncus subsecundus*; *Opercularia varia*; *Oxalis perennans*; *Ajuga australis*; *Mentha diemenica*; *Wahlenbergia stricta* subsp. *stricta*; *Dichopogon strictus*; *Asperula conferta*; *Glycine clandestina*; *Poranthera microphylla*; *Arthropodium minus*; *Cheiranthra cyanea* var. *cyanea*.

**Weed Species:** *Hypericum perforatum*; *Anagallis arvensis*; *Vulpia bromoides*; *Vulpia muralis*; *Hypochaeris glabra*; *Hypochaeris radicata*; *Rubus ulmifolius*; *Centaurium erythraea*; *Trifolium campestre*; *Bromus hordeaceus*; *Cirsium vulgare*; *Conyza bonariensis*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Barking Owl; Swift Parrot; Black-chinned honeyeater.

**Mean Species Richness:** 40 +/- 10 (Gellie & Fanning 2004 in 20 x 20 m plots).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland; Open Forest.

**Height Class (WH):** Tall; Mid-High.

**Vegetation Description:** Tall to mid-high woodland or open forest dominated by White Box (*Eucalyptus albens*), Blakely's Red Gum (*Eucalyptus blakelyi*), Long-leaved Box (*Eucalyptus goniocalyx*) and Red Stringybark (*Eucalyptus macrorhyncha*) and often with Red Box (*Eucalyptus polyanthemos*). Some areas may contain occasional Mugga Ironbark (*Eucalyptus sideroxyton*). Shrubs are sparse and include *Acacia paradoxa*, *Dillwynia sericea*, *Acacia implexa*, *Acacia genistifolia*, *Lissanthe strigosa* subsp. *strigosa*, *Bursaria spinosa* subsp. *spinosa*, *Daviesia latifolia*, *Hibbertia obtusifolia* and *Melichrus urceolatus*. The ground cover is generally mid-dense. Grass species include *Microlaena stipoides* var. *stipoides*, *Poa sieberiana*, *Themeda australis*, *Austrodanthonia eriantha*, *Austrostipa densiflora* and *Elymus scaber* var. *scaber*. Forb species include *Dianella revoluta* var. *revoluta*, *Hydrocotyle laxiflora*, *Solenogyne dominii*, *Acaena* spp., *Gonocarpus tetragynus*, *Geranium solanderi* var. *solanderi*, *Xerochrysum* spp. and *Arthropodium minus*. The rush *Luzula densiflora* and sedges *Schoenus apogon*, *Carex breviculmis* and *Carex inversa* may occur. The mat-rush *Lomandra filiformis* is usually common. Occurs on shallow clay or loamy clay soils derived from fine grained sedimentary, metamorphic or igneous substrates on hillcrests hillslopes in low hill and hill landform patterns in the upper slopes sub-region of the NSW South-western Slopes Bioregion. Mostly cleared with some remnants in more rugged terrain or in public land with degraded patches on private land. Weeds are abundant in some locations including St John's Wort (*Hypericum perforatum*) that may be a problem. A threatened plant community due to the degree of clearing and alteration of the ground cover. This woodland provides habitat for a number of threatened woodland bird species and its restoration would assist with landscape function for some key species of fauna.

**Level of Classification:** Alliance / Sub-formation.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 175- White Box (P); 99 - Red Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). A broadly classified type occurring on hills on NSW SW Slopes Bioregion. Includes Vegetation Group 27 in Gellie & Fanning (2004). Probably includes Vegetation Group 120 in Gellie (2005). Includes part of the Kyeamba Granites and part of the Coreinbob Hills vegetation map units in Wagga Wagga Shire mapped by Priday (2004). Community 3 in Australian Bush Heritage Fund (2001). Observed in Benson (1999-2009).



**Interstate Equivalent(s):** Victoria: part of EVC 175\_62 Rainshadow Grassy Woodland or EVC.

**Mapped/Modelled:** Current extent and pre-European extent not mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Small areas mapped in some reserves and local government areas but not mapped over full range as of 2007.

**Climate Zone:** Temperate: no dry season (hot summer); Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Lower Slopes (1-30%); Upper Slopes (>70%).

**Botanical Division:** South Western Slopes (SWS) (30-70%); Central Western Slopes (CWS) (1-30%).

**Local Govt. Areas:** Bland (1-30%); Cabonne (1-30%); Coolamon (1-30%); Cootamundra (1-30%); Cowra (1-30%); Forbes (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Lockhart; Junee (1-30%); Orange (1-30%); Parkes (1-30%); Wagga Wagga (1-30%); Weddin (1-30%); Wellington (1-30%); Young (1-30%); Boorowa (1-30%).

**CMAs:** Murray (30-70%); Murrumbidgee (30-70%); Central West (1-30%); Lachlan (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Colluvium; Igneous rocks; Plutonic rocks; Metamorphic rocks; Sedimentary rocks.

**Lithology:** Arkose; Colluvial sediments; Granite; Shale; Sandstone.

**Great Soil Group:** Black earth; Brown clay.

**Soil Texture:** Clay loam; Light clay.

**Landform Patterns:** Hills; Low hills.

**Landform Elements:** Foothills; Gully; Hillslope.

**Land Use:** Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 80000 ha  $\pm$ 30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate based on landscape position.

**Current Extent:** 30000 ha  $\pm$ 30% or 38%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Mostly cleared. Some areas are recorded in reserves but these represent a minor part of the original extent.

**Conservation Reserves:** Benambra NP 1029 (M); Livingstone NP 230 (E1); Livingstone SCA 28 (M); Nest Hill NR 60 (M); Tabletop NR 7 (M); Woomargama NP 30 (E3); Ellerslie NR 300 (E3); Tumblong SCA 260 (E1).

**Reserves Total Area:** 1944 ha.

**No. Representatives in Reserves:** 8

**Protected Area Explanation:** Benambra NP, Livingstone NP, Livingstone SCA, Nest Hill BR and Tabletop NR areas from vegetation group 27 in Gellie & Fanning (2004). Tarcutta Hills BHR from ABH (2001) including 30 ha of regenerating woodland. Woomargama NP area from estimate in Benson (1999-2009) retyping an area of veg group 22 in Gellie & Fanning (2004) on South Creek Trail on the edge of the park. Tarcutta Hills ABH reserve area from ABH (2001) including 50 ha of regenerating woodland. Ellerslie NR and Tumblong SCA from DECCW South ADS-40 mapping 2010.

**Secure Property Agreements:** Tarcutta Hills BHR 80 (E2).

**Secure PAs Total Area:** 80 ha.

**No. Representatives in Secure Property Agreements:** 1

**Protected Current Extent:** 6.74% 2024 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 9

**Protected Pre-European Extent:** 2.53% which is inadequately protected across distribution.

**Common in 1750:** Code 4a: 1-5% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Few sites remain in good condition other than those in reserves. Surveys are required to document sites for conservation action. Wyangala State Recreation Area contains good examples of this community. Hills north of Albury contain some areas worthy of restoration.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Varies due to grazing history and grazing intensity. High levels of grazing reduces shrub cover and shrub diversity and favours the development of a grassy ground cover. Areas in non-grazing reserves tend to have denser shrub cover and large variety of species.

**Fire Regime:** Prior to European settlement there was probably Aboriginal burning of grassy woodlands - the frequency of which is debatable. Fire is now limited by fragmentation due to clearing and lack of ground cover due to grazing. The prevalence of an annual ground flora in many locations may also have changed the intensity of fire compare to pre-European times.

**Adjoining Communities:** Grades into Red Stringybark (e.g. ID348), Mugga Ironbark (e.g. ID342) or Inland Scribbly Gum communities upslope on shallower soils and into grassy White Box woodland (ID266) on clay soils on undulating hills. Grades into ID286 (Swampy Red Box Woodland) in depressions and along creeks in the south. Similar to the restricted community (ID269) that occurs on the hills around Albury but ID268 lacks some of the shrub species that are in ID269.

**Threatening Processes:** A vulnerable community due to past clearing resulting in a highly fragmented landscape. Exotic pasture weeds occur in many locations. Few remnants contain a healthy shrub or ground cover plant species composition.

**Threatening Process List:** Clearing for agriculture; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/4a

**Threat Criteria:** 5; 4; 1.

**Planning Controls:**

**Planning and Management:** Protect more stands under property agreements or in reserves. Limit grazing to allow for regeneration of the community where this is possible.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist and not required.

**Reference List:** (308; 340; 344; 316; 353). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Australian Bush Heritage Fund (2001) Tarcutta Hills Reserve Management Plan (Australian Bush Heritage Fund: Melbourne); Priddy, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254.

Friday, 27 January 2012

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# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 276

**Common Name:** Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus melliodora* / *Acacia decora* - *Maireana microphylla* / *Bothriochloa macra* - *Austrostipa bigeniculata* - *Austrodanthonia setacea* - *Vittadinia cuneata*

**Veg. Comm. ID.:** 276 **Original Entry:** J.S. Benson 18/01/2006

**Photo 1:** ID276a\_benson.jpg Yellow Box woodland on red loam and alluvium north of Junee, 14/03/2007, J.S. Benson.



**Photo 2:** ID276b\_DX27763.jpg Yellow Box woodland on alluvial flats south of Jugiong grading into *Eucalyptus blakelyi* (ID277) on hills in the background, [AGD66 34°54.298'S 148°19.100'E], 29/04/2006, Jaime Plaza.



**Photo 3:** ID276c\_PC261-21.jpg *Eucalyptus melliodora* woodland on flats near Nubingerie, West of Wellington, [AGD66 32°31'22.7"S 148°40'15.8"E], 08/05/2005, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus melliodora*; *Eucalyptus blakelyi*; *Eucalyptus bridgesiana*.

**Shrubs/Vines/Epiphytes:** *Acacia decora*; *Maireana microphylla*; *Acacia deanei* subsp. *deanei*; *Acacia implexa*; *Acacia montana*; *Acacia pycnantha*; *Acacia paradoxa*.

**Ground Cover:** *Bothriochloa macra*; *Austrostipa bigeniculata*; *Vittadinia cuneata*; *Elymus scaber* var. *scaber*; *Chloris truncata*; *Convolvulus graminetinus*; *Sida corrugata*; *Goodenia pinnatifida*; *Austrodanthonia auriculata*; *Austrodanthonia setacea*; *Austrostipa scabra* subsp. *falcata*; *Calotis cuneata* var. *cuneata*; *Carex inversa*; *Oxalis exilis*; *Rumex brownii*.

**Weed Species:** *Avena barbata*; *Paspalum dilatatum*; *Lolium perenne*; *Hordeum leporinum*; *Verbena bonariensis*; *Marrubium vulgare*; *Holcus lanatus*; *Echium plantagineum*; *Sonchus oleraceus*; *Bromus hordeaceus*.

**Weediness:** Very high (>30%) with >30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall grassy woodland dominated by Yellow Box (*Eucalyptus melliodora*) generally without other tree species or if present they are in low numbers. The shrub layer is either absent or very sparse and includes wattles such as *Acacia decora*, *Acacia implexa* and *Acacia pycnantha*. The ground cover is generally dense and dominated by grasses including *Bothriochloa macra*, *Austrostipa bigeniculata*, *Elymus scaber* var. *scaber* and *Chloris truncata*. Forbs include *Sida corrugata*, *Goodenia pinnatifida* and *Vittadinia cuneata*. Occurs on alluvial or aelian (parna) red-brown loam or clay soils on flats on floodplains or plains in the NSW South-western Slopes Bioregion generally west of the Hume Highway around Wagga Wagga to Temora and north to Wellington. Grades into the more common Yellow Box - Blakely's Red Gum community and White Box (*Eucalyptus albens*) woodland on upper slopes to the east and a similar ID312 in this same region. This is an endangered community because most of it has been cleared due to its occurrence on arable soils and its location on flat terrain that is suitable for grazing and cropping including irrigation. Pasture weeds have invaded most remnants.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 171 - Yellow Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes the Yellow Box Woodland in Priday (2004) and probably part of Biolandscapes SouA24, SouA25c and SouA25d in Priday (2006). Community 2 *Eucalyptus melliodora* in Austin et al. for Lachlan River catchment. Yellow Box woodland in Mid-Lachlan Regional Vegetation Committee (1999). A western form of the mainly tablelands Vegetation Group 161 in Gellie (2005) (ID312). Part of BVT 70 in DEC (2006a). Noted by Benson (1999-2009).

**Interstate Equivalent(s):** Victoria: part of EVC188 Plains Grassy Woodland / Valley Grassy Forest Complex.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Partly mapped and modelled for areas such as Wagga Wagga (Priday 2004) and Mid-Lachlan (Austin et al. (2000) but not mapped or sampled over its full range.

**Climate Zone:** Temperate: no dry season (hot summer); Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (30-70%); Lower Slopes (30-70%).

**Botanical Division:** South Western Slopes (SWS) (1-30%); Central Western Slopes (CWS) (30-70%); Central Tablelands (CT) (1-30%); Southern Tablelands (ST) (1-30%).

**Local Govt. Areas:** Cabonne (1-30%); Coolamon (1-30%); Forbes (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Cootamundra (1-30%); Junee (1-30%); Mid-Western Regional (1-30%); Parkes (1-30%); Temora (1-30%); Lockhart; Wagga Wagga (1-30%); Weddin (1-30%); Wellington (1-30%); Young (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium; Eolian sediment; Parna.

**Lithology:** Alluvial loams and clays; Eolian sand or loam.

**Great Soil Group:** Alluvial soil; Brown clay; Brown earth; Calcareous red earth.

**Soil Texture:** Clay loam; Light clay; Silty clay loam; Silty loam.

**Landform Patterns:** Alluvial plain; Low hills.

**Landform Elements:** Backplain; Plain; Terrace plain; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range; Older age class over most of distribution.

**Pre-European Extent:** 40000 ha  $\pm$ 50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate based on landscape position and distribution in relation to clearing patterns. Yellow Box woodland on flats would have been more restricted than similar box woodlands on slopes.

**Current Extent:** 4000 ha  $\pm$ 50% or 10%  $\pm$  70% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Estimate. Very little remains in good condition. These rich soil flats have been nearly totally cleared.



**Conservation Reserves:** None.

**Reserves Total Area:** 0 ha.

**No. Representatives in Reserves:** 0

**Protected Area Explanation:** Property Agreements WT9910 and YO0102 estimates from DNR canopy species database.

**Secure Property Agreements:** YO0102 PA 43 (E2); WT9910 PA 30 (E2).

**Secure PAs Total Area:** 73 ha.

**No. Representatives in Secure Property Agreements:** 2

**Protected Current Extent:** 1.82% 73 ha ± 30%.

**No. Representatives in Protected Areas:** 2

**Protected Pre-European Extent:** 0.18% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Requires survey of remnants on alluvial and valley flats. Examples include Kyeamba Creek alluvial floodplain east of Wagga and on alluvium to red loamy parma soils north of Wagga, also occurs near Junee.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Floristic composition varies over range from north to south. Shrub density probably depends on long term grazing pressure.

**Fire Regime:** Rarely burns due to fragmentation and grazing. May have been patch burnt by Aborigines before European settlement. Fire may be important as a means to reduce Nitrogen levels that favour the dominance of exotic annual species.

**Adjoining Communities:** Grades into the more widespread Yellow Box - Blakely's Red Gum (ID277) and various White Box woodlands on adjoining slopes. Grades into the riparian Yellow Box - River Red Gum community (ID74) on the lower slopes and plains to the west. Similar tree composition and structure to ID312 that occurs on the very upper slopes and tablelands. Similar to ID437 in the BBS Bioregion north of Wellington.

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Firewood collection; Irrigated cropping (incl. horticulture); Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: gully, tunnel, landslips; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** .

**Planning Controls:**

**Planning and Management:** Protect remnants from further clearing and fence off some to allow regeneration due to the senescence of old trees. Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002).

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (308; 316; 183; 67; 348; 353; 356; 373). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeoglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Lambert, J. & Elix, J. (2002) Grassy White Box woodlands information kit (Community Solutions: Sydney); Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254; Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 277

**Common Name:** Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus blakelyi* - *Eucalyptus melliodora* - *Eucalyptus bridgesiana* / *Acacia dealbata* / *Themeda australis* - *Poa sieberiana* - *Bothriochloa macra* - *Aristida ramosa*

**Veg. Comm. ID.:** 277 **Original Entry:** J.S. Benson 19/01/2006

**Photo 1:** ID277a\_PC171-11.jpg Yellow Box (*Eucalyptus melliodora*) - Blakely's Red Gum (*E. blakelyi*) tall woodland, on flats near Forbes [AGD66 33°24'37"S 148°11'23"E], 10/10/02, Jaime Plaza.



**Photo 2:** ID277b\_SWS0507093.jpg Blakely's Red Gum (*Eucalyptus blakelyi*) - Yellow Box (*Eucalyptus melliodora*) woodland on light brown soils along High Rock Road east of Rye Park, [AGD66 34°32.025'S 148°55.483'E], 29/5/2007, Jaime Plaza.



**Photo 3:** ID277c\_PC262-6.jpg *Eucalyptus melliodora* - *E. blakelyi* grassy woodland on the Yeoval-Cumnock Road, [AGD66 32°53'26.6"S 148°44'12.1"E], 8/05/2005, Jaime Plaza.





**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus blakelyi*; *Eucalyptus melliodora*; *Eucalyptus bridgesiana*; *Eucalyptus albens*; *Eucalyptus microcarpa*; *Eucalyptus conica*; *Callitris glaucophylla*; *Eucalyptus goniocalyx*; *Eucalyptus polyanthemos subsp. polyanthemos*.

**Shrubs/Vines/Epiphytes:** *Acacia dealbata*; *Hibbertia obtusifolia*.

**Ground Cover:** *Themeda australis*; *Poa sieberiana*; *Bothriochloa macra*; *Aristida ramosa*; *Panicum effusum*; *Austrostipa verticillata*; *Austrostipa scabra subsp. scabra*; *Austrostipa bigeniculata*; *Austrodanthonia auriculata*; *Austrodanthonia setacea*; *Cymbopogon refractus*; *Elymus scaber var. scaber*; *Juncus usitatus*; *Lomandra filiformis subsp. coriacea*; *Alternanthera nana*; *Geranium solanderi var. solanderi*; *Chrysocephalum apiculatum*; *Sida corrugata*; *Carex inversa*; *Wahlenbergia luteola*; *Chloris truncata*; *Cheilanthes sieberi subsp. sieberi*; *Vittadinia cuneata*; *Lomandra filiformis subsp. coriacea*; *Enteropogon acicularis*; *Convolvulus graminetinus*; *Bulbine bulbosa*; *Dianella revoluta var. revoluta*; *Calotis scabiosifolia var. scabiosifolia*.

**Weed Species:** *Marrubium vulgare*; *Plantago lanceolata*; *Paspalum dilatatum*; *Bromus hordeaceus*; *Echium plantagineum*; *Anagallis arvensis*.

**Weediness:** Very high (>30%) with 10-30% cover.

**Threatened Plants:** *Ammobium craspedioides*.

**Threatened Fauna:** Brown Treecreeper, Superb Parrot, Swift Parrot, Grey-crowned Babbler, Bush Thickknee; Squirrel Glider.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland to about 20 m high dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). Blakely's Red Gum or Yellow Box vary in their dominance and either can be absent in some places grading into areas with more Apple Box (*Eucalyptus bridgesiana*), Long-leaved Box (*Eucalyptus goniocalyx*) and rarely *Eucalyptus microcarpa* or *Eucalyptus polyanthemos*. Shrubs are sparse or absent and may include *Acacia dealbata*. The ground cover may be dense to sparse depending on rainfall and is dominated by grass species including *Poa sieberiana*, *Bothriochloa macra*, *Aristida ramosa*, *Themeda australis*, *Austrodanthonia* spp and *Austrostipa* spp. Forbs include *Vittadinia cuneata*, *Chrysocephalum apiculatum* and *Sida corrugata*. A very widespread community on fertile deep, loam or clay soils derived from a range of substrates including fine-grained sedimentary and metamorphic rocks but also volcanics and fine-grained granite. Occurs on flats, footslopes and hillslopes mainly in the upper slopes sub-region of the NSW South-western Slopes Bioregion mainly east of Wagga Wagga. Grades into White Box (*Eucalyptus albens*) grassy woodland (ID266) on hillslopes and into either ID76 (Western Grey Box woodland) or ID276 (Yellow Box woodland) on parna or alluvial flats. Mainly cleared and subjected to nitrification from fertilizers and associated weed invasion.

**Level of Classification:** Alliance / Sub-formation.

**Classification Confidence Level:** High.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 172 - Yellow Box-Blakely's Red Gum (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). A broadly classified community covering a large area of the NSW South-western Slopes. Includes Yellow Box- Blakely's Red Gum in Mid-Lachlan RVMC (1999). Vegetation class 1 in NECS (1999) for the Yass Shire. Includes Vegetation Group 160 in Gellie (2005). Community D8 in Seddon et al.(2002) for Little River area. BRG - YB variations in South West Slopes Revegetation Guide (Stelling 1998). Probably community 5 in Austin et al. (2000). Part of Blakely's Red Gum - Yellow Box community in NSW NPWS (2002a). Includes Biolandscape EaS24, part of SouA24 and SouV24 and part of BulS24 in Friday (2006). Part of BVT 46 in DEC (2006, 2006a). The combination Yellow Box- Blakely's Red Gum is one of the most widespread on the NSW slopes and tablelands gradually differing in floristics over its range with altitude, soil type and latitude.

**Interstate Equivalent(s):** Victoria: part of EVC 175 Grassy Woodland or EVC 47 Valley Grassy Forest.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mapped in some local government areas and reserves and in some regional assessments (for example vegetation group 160 in Gellie 2005). Areas mapped in ADS-40 mapping on SW slopes by DECCW (eg DECCW 2010b).

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%); Bondo (1-30%); Murrumbateman (1-30%).

**Botanical Division:** South Western Slopes (SWS) (30-70%); Central Western Slopes (CWS) (30-70%).

**Local Govt. Areas:** Albury (1-30%); Boorowa (1-30%); Cabonne (1-30%); Coolamon (1-30%); Cootamundra (1-30%); Cowra (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Junee (1-30%); Mid-Western Regional (1-30%); Parkes (1-30%); Tumbarumba (1-30%); Tumut (1-30%); Upper Lachlan (1-30%); Wagga Wagga (1-30%); Weddin (1-30%); Wellington (1-30%); Young (1-30%); Yass Valley (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Igneous rocks; Plutonic rocks; Metamorphic rocks; Sedimentary rocks.

**Lithology:** Colluvial sediments; Granite; Limestone; Microgranite; Mudstone; Phyllite; Shale; Slate; Limestone.

**Great Soil Group:** Brown clay; Brown earth; Grey-brown podzolic soil; Solodized solonetz.

**Soil Texture:** Clay loam; Light clay.

**Landform Patterns:** Hills.

**Landform Elements:** Footslope; Hillslope; Plain; Valley flat.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Dieback due to disease or senescence; Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 500000 ha  $\pm$ 30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Estimate based on landscape position and distribution in relation to clearing patterns. This community would have been one of the most widespread communities on the upper south western slopes and adjacent tablelands. Gellie (2005) modelled about 250000 ha over part of its range as his Vegetation Group 160.



**Current Extent:** 30000 ha  $\pm$ 30% or 6%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Most mapping and surveys point to most of this community having been extensively cleared, particularly the ground cover which is now dominated by exotic species. Gellie (2005) estimates only 3% remains intact. Large areas of isolated paddock trees remain with exotic ground pasture cover but these areas are considered as cleared in this estimate. Modeling of this community in Yass Shire (NECS 1999) estimates that only 7% remains there. modelled mpping of Vegetation Group 160 in Gellie (2005) suggests that only 3% remains overall.

**Conservation Reserves:** Boginderra Hills NR 10 (M); Ulandra NR 758 (E1); Woomargama NP 220 (E1); Jingellic NR 24 (M); Conimbla NP 90 (E4); Jindalee NP 10 (E1).

**Reserves Total Area:** 1112 ha.

**No. Representatives in Reserves:** 6

**Protected Area Explanation:** Woomargama NP and Ulandra NR from vegetation group 23 in Gellie & Fanning (2004). Boginderra Hills NR from Lembit & Skelton (1998) although this may have been shrubbier (ID278) before grazing. Jingellic NR from group 26 in EcoGIS (2005). Yellow Box map unit in Conimbla NP by ERM Mitchell McCotter (1996) but this needs checking. Jindalee NP from DECCWb). WW9901 and WT9902 estimates from DNR PA database.

**Secure Property Agreements:** WW9901 PA 17 (E2); WT9902 PA 313 (E2).

**Secure PAs Total Area:** 330 ha.

**No. Representatives in Secure Property Agreements:** 2

**Protected Current Extent:** 4.8% 1442 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 8

**Protected Pre-European Extent:** 0.28% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** The best remnants occur along roadsides, in cemeteries and in Travelling Stock Reserves with examples such as Godfreys Creek, Breakfast Creek and Doonside TSRs in the Boorowa Shire. Quamby - Thuddungra TSR near Forbes and other areas.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Ground cover alters composition across its wide distribution with altitude and latitude, but there are many species that are common to most sites across its range.

**Fire Regime:** Fire may be important as a means to reduce Nitrogen levels that favour the dominance of exotic annual species.

**Adjoining Communities:** Grades into ID341 on hilly landscapes where Red Box co-occurs with Blakely's Red Gum. Grades into Yellow Box (Eucalyptus melliodora) grassy woodland (ID276) on river flats and they share many species. Grades into White Box woodland (ID266) on better drained duplex soils upslope and into various Red Box, Long-leaved Box or Red Stringybark communities on steeper slopes

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Echium (Patersons Curse) is a major weed species. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Clearing for pine plantations; Disease and/or dieback (abnormal); Dryland cropping; Firewood collection; Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: gully, tunnel, landslips; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002). Need to encourage nature ground cover by eliminating fertilizer use and fencing off remnants to allow trees to regrow. Weeding programs are required for some areas.

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (67; 341; 183; 336; 276; 348; 179; 349; 350; 263; 356; 353; 372; 373; 634). Mid-Lachlan Regional Vegetation Committee (1999) Plan Draft Mid-Lachlan Regional Vegetation Management Plan for Public Exhibition. (Mid-Lachlan RVC: Forbes); Stelling, F. (Ed.) (1998) South West Slopes Revegetation Guide (Murray Catchment Management Committee and Department of Land & Water Conservation: Albury); Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); NSW National Parks and Wildlife Service (2002a) The native vegetation of Boorowa Shire (NSW National Parks and Wildlife Service: Hurstville); Seddon, J., Briggs, S. & Doyle, S. (2002) Little River Catchment biodiversity assessment. Report. (NSW National Parks and Wildlife Service c/- CSIRO Sustainable Ecosystems: Canberra); Lambert, J. & Elix, J. (2002) Grassy White Box woodlands information kit (Community Solutions: Sydney); Lembit, R. & Skelton, N. (1998) Vegetation survey of Copperhanna, Barton, Dapper and Boginderra Hills Nature Reserves. Report to the NSW National Parks and Wildlife Service: Central West; National Environmental Consulting Services (NECS) (1999) Yass Shire vegetation mapping Stage 1 (Yass Shire Council: Yass); EcoGIS (2005) Vegetation of the Upper Murray reserves: Report to NSW Department of Environment and Conservation (DEC Upper Murray Area, Snowy Mountains Region: Khancoban); ERM Mitchell McCotter Pty. Ltd. (1996) Bathurst vegetation survey for NSW National Parks and Wildlife Service: Bathurst District covering Winburndale NR, Nangar NP, Conimbla NP and Weddin Mountains NP. (NSW National Parks and Wildlife Service: Bathurst); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South-western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. Cunninghamia 9(2): 219-254; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DECCW (2010b) Vegetation Mapping by 3-D Digital Image Interpretation - DECCW South Branch Report Series Report No. 3: Vegetation of the Cootamundra and June 1:100,000 mapsheets. Technical Report DECCW 2010/70. NSW Department of Environment, Climate Chang.

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 278

**Common Name:** Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus blakelyi* - *Eucalyptus bridgesiana* / *Acacia dealbata* - *Acacia deanei* subsp. *paucijuga* - *Styphelia triflora* / *Carex appressa* - *Hydrocotyle laxiflora* - *Rumex brownii* - *Poa labillardierei* var. *labillardierei*

**Veg. Comm. ID.:** 278 **Original Entry:** J.S. Benson 20/01/2006

**Photo 1:** ID278a\_PC248-16.jpg *Eucalyptus blakelyi* valley sedge-grass woodland with *Acacia paradoxa* shrubs in Goobang NP, Spring Creek Trail, [AGD66 32°57'23"S 148°25'16.9"E], 04/05/2005, Jaime Plaza.



**Photo 2:** ID278b\_PC174-16.jpg *Eucalyptus blakelyi* - *E.goniocalyx* riparian woodland with *Gahnia aspera* ground cover. Conimbla National Park, [AGD66 33°48'40"S 148°26'50"E], 11/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus blakelyi*; *Eucalyptus melliodora*; *Eucalyptus bridgesiana*; *Eucalyptus goniocalyx*; *Eucalyptus microcarpa*.

**Shrubs/Vines/Epiphytes:** *Acacia dealbata*; *Acacia paradoxa*; *Acacia deanei* subsp. *paucijuga*; *Styphelia triflora*; *Acrotriche rigida*; *Acacia acinacea*; *Dodonaea viscosa* subsp. *Cuneata*.

**Ground Cover:** *Carex appressa*; *Hydrocotyle laxiflora*; *Rumex brownii*; *Juncus flavidus*; *Poa labillardierei* var. *labillardierei*; *Microlaena stipoides* var. *stipoides*; *Carex inversa*; *Carex incomitata*; *Juncus subglaucus*; *Poranthera microphylla*; *Centipeda cunninghamii*; *Echinopogon ovatus*; *Cynoglossum australe*; *Scutellaria humilis*; *Dichondra repens*; *Dianella revoluta* var. *revoluta*; *Geranium retrorsum*; *Acaena ovina*; *Persicaria lapathifolia*; *Ranunculus sessiliflorus* var. *sessiliflorus*; *Ranunculus pumilio* var. *pumilio*; *Oxalis perennans*; *Xerochrysum viscosum*; *Gahnia aspera*.

**Weed Species:** *Centaurium erythraea*; *Hypochaeris glabra*; *Hypochaeris radicata*; *Rubus discolor*; *Phalaris aquatica*; *Trifolium repens*; *Trifolium campestre*; *Vulpia bromoides*; *Anagallis arvensis*; *Cirsium vulgare*; *Briza minor*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** *Pomaderris costata* (restricted near Parkes).

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 45 +/- 10 (community 6 in Porteners 1997a in 20 x 20 m plots).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Open Forest; Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall open forest or woodland dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) often with Yellow Box (*Eucalyptus melliodora*), Apple Box (*Eucalyptus bridgesiana*) or Long-leaved Box (*Eucalyptus gonicalyx*). Shrubs are sparse and usually contain a number of wattles (*Acacia* spp) with tea tree (*Leptospermum* spp) or hopbush (*Dodonaea viscosa* var. *cuneata*). The ground cover is often dense containing sedges such as *Carex appressa* and other *Carex* species. Rushes (*Juncus* spp.) may be common in wet sites. Grasses include *Poa labillardierei* var. *labillardierei* and *Microlaena stipoides* var. *stipoides*. Forbs include *Rumex brownii*, *Ranunculus* spp., *Hydrocotyle laxiflora*, *Dichondra repens*, *Dianella revoluta* var. *revoluta*, *Geranium retrorsum*, *Acaena ovina*, *Persicaria lapathifolia* and *Ranunculus sessiliflorus* var. *sessiliflorus*. Occurs on deep alluvial silty clay-loam soils in gullies and on creek flats in hill landscapes or along creeks mainly in the Upper Slopes sub-region of the NSW South-western Slopes Bioregion. Mostly cleared with some areas remaining along creeks in forested hills. Grades into the widespread ID277 Blakely's Red Gum - Yellow Box woodland on hillslopes with deep soil.

**Level of Classification:** Association.

**Classification Confidence Level:** Low.

**Formation Group:** Eucalyptus (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus forests with a grassy understorey.

**Forest Type (RN 17):** 178 - Western Red Gums (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Possibly includes north-western areas of Vegetation Group 162 in Gellie (2005). Community I in Conimbla National Park (ERM Mitchell McCotter 1996). Sub-community D9 Seddon et al.(2002) for Little River Catchment. Community 6 in Porteners (1997a) for Goobang NP. Part of BVT 46 in DEC (2006, 2006a). A broadly classified community (sub-formation) covering riparian vegetation dominated by Blakely's Red Gum for the central to north parts of the NSW South-western Slopes Bioregion.

**Interstate Equivalent(s):** .

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mapped in some reserves but not over whole range. Distributed over a large area but with limited remaining areas.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); South Eastern Highlands (30-70%).

**IBRA Sub-Region:** Crookwell (1-30%); Hill End (1-30%); Murrumbateman (1-30%); Orange (1-30%); Oberon (1-30%); Upper Slopes (30-70%).

**Botanical Division:** South Western Slopes (SWS) (1-30%); Central Western Slopes (CWS) (30-70%); Central Tablelands (CT) (1-30%).

**Local Govt. Areas:** Bathurst Regional (1-30%); Blayney (1-30%); Boorowa (1-30%); Cootamundra (1-30%); Cowra (1-30%); Forbes (1-30%); Harden (1-30%); Orange (1-30%); Parkes (1-30%); Weddin (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Alluvium; Colluvium.

**Lithology:** Alluvial loams and clays; Colluvial sediments.

**Great Soil Group:** Grey earth; Grey-brown podzolic soil.

**Soil Texture:** Clay loam; Silty clay loam.

**Landform Patterns:** Hills; Plateau; Terrace (alluvial).

**Landform Elements:** Bank (streambank); Gully; Valley flat.

**Land Use:** Grazing.

**Impacts of European Settlement:** Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 30000 ha  $\pm$ 50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate based on landscape position and distribution in relation to clearing patterns over NSW SW Slopes Bioregion.

**Current Extent:** 6000 ha  $\pm$ 50% or 20%  $\pm$  70% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Model of Vegetation Group 162 (Gellie (2005) 78% had been cleared for one region.

**Conservation Reserves:** Conimbla NP 353 (M); Goobang NP 3000 (E1).

**Reserves Total Area:** 3353 ha.

**No. Representatives in Reserves:** 2

**Protected Area Explanation:** Conimbla NP from ERM Mitchell McCotter (1996). Goobang NP from map unit 6 and proportion of mosaics with 6 in them in Porteners (1997a). VCA081 from file description of creek vegetation.

**Secure Property Agreements:** VCA081 VCA 21 (E3).

**Secure PAs Total Area:** 21 ha.

**No. Representatives in Secure Property Agreements:** 1

**Protected Current Extent:** 56.23% 3374 ha  $\pm$  50%.

**No. Representatives in Protected Areas:** 3

**Protected Pre-European Extent:** 11.24% which is inadequately protected across distribution.

**Common in 1750:** Code 3a: 5-15% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Requires specific survey. Few sites in good condition remain as most areas are cleared or invested with weeds.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** There is large variation in species composition over the range of this community with consistently recurring species in all layers.

**Fire Regime:** Some valleys may have been patch burnt by Aboriginal people. Current fire regimes vary across its range - some areas are burnt regularly (less than 10 years) others infrequently.

**Adjoining Communities:** Grades into the more widespread grassy Blakely's Red Gum - Yellow Box woodland (ID277) on hills and plateaux. Grades into ID79 where River Red Gum in larger streams or western areas. Grades into a variety of forests on adjoining slopes in hilly country being dominated by box or stringybark trees. Some similarities with ID298 in the southern part of the NSW South-western Slopes and ID283 where Apple Box dominates. Grades upslope into ironbark woodlands in northern range.

**Threatening Processes:** Few areas remain in good condition due to its position in valleys. Past clearing has resulted in highly fragmented remnants. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a



natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Clearing for agriculture; Clearing for pine plantations; Disease and/or dieback (abnormal); Nutrient changes through fertilizers or runoff; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/3a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002).

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box-

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (263; 69; 348; 276; 372; 373). ERM Mitchell McCotter Pty. Ltd. (1996) Bathurst vegetation survey for NSW National Parks and Wildlife Service: Bathurst District covering Winburndale NR, Nangar NP, Conimbla NP and Weddin Mountains NP. (NSW National Parks and Wildlife Service: Bathurst); Porteners, M.F. (1997a) Vegetation communities of Goobang National Park and adjoining areas. Unpublished report and vegetation map to NSW National Parks and Wildlife Service: Bathurst; Lambert, J. & Elix, J. (2002) Grassy White Box woodlands information kit (Community Solutions: Sydney); Seddon, J., Briggs, S. & Doyle, S. (2002) Little River Catchment biodiversity assessment. Report. (NSW National Parks and Wildlife Service c/- CSIRO Sustainable Ecosystems: Canberra); DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 280

**Common Name:** Red Stringybark - Blakely's Red Gum +- Long-leaved Box shrub/grass hill woodland of the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus macrorhyncha* - *Eucalyptus blakelyi* - *Eucalyptus gonicalyx* / *Lissanthe strigosa* subsp. *strigosa* - *Cassinia aculeata* - *Bursaria spinosa* - *Acacia baileyana* / *Austrodanthonia setacea* - *Austrostipa densiflora* - *Themeda australis* - *Chrysocephalum semipapposum*

**Veg. Comm. ID.:** 280 **Original Entry:** J.S. Benson 23/01/2006

**Photo 1:** ID280a\_PC184-19.jpg *Eucalyptus gonicalyx* - *E. blakelyi* shrub - grass woodland on hills on the Temora - Cootamundra Road, [AGD66 34°33'32"S 147°58'11"E], 14/10/02, Jaime Plaza.



**Photo 2:** ID280b\_PC184-14.jpg The tall shrub *Acacia baileyana* in *Eucalyptus gonicalyx* - *E. blakelyi* woodland on the Stockinbingal - Cootamundra Road, [AGD66 34°33'32"S 147°58'11"E], 14/10/02, Jaime Plaza.



**Photo 3:** ID280c\_DX27774.jpg *Eucalyptus gonicalyx* - *E. blakelyi* - *E. melliodora* - *E. macrorhyncha* open forest on a ridge on Adjunbilly Road south of Jugiong, SW Slopes, [AGD66 35°03.746'S 148°20.115'E], 29/4/2006, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus macrorhyncha*; *Eucalyptus blakelyi*; *Eucalyptus goniocalyx*; *Eucalyptus melliodora*; *Eucalyptus polyanthemos* subsp. *polyanthemos*; *Eucalyptus dealbata*; *Callitris endlicheri*; *Brachychiton populneus* subsp. *populneus*.

**Shrubs/Vines/Epiphytes:** *Lissanthe strigosa* subsp. *strigosa*; *Bursaria spinosa*; *Acacia buxifolia* subsp. *buxifolia*; *Pultenaea foliolosa*; *Acacia baileyana*; *Acacia verniciflua*; *Cassinia aculeata*; *Hibbertia obtusifolia*; *Dodonaea viscosa* subsp. *spatulata*; *Leptospermum brevipes*.

**Ground Cover:** *Austrodanthonia setacea*; *Austrostipa densiflora*; *Themeda australis*; *Chrysocephalum semipapposum*; *Xerochrysum viscosum*; *Dianella revoluta* var. *revoluta*; *Hydrocotyle laxiflora*; *Stackhousia monogyna*; *Aristida ramosa*; *Gonocarpus tetragynus*; *Elymus scaber* var. *scaber*; *Hardenbergia violacea*; *Crassula sieberiana* subsp. *sieberiana*; *Triptilodiscus pygmaeus*; *Stuartina muelleri*; *Cheilanthes sieberi* subsp. *sieberi*; *Lomandra bracteata*; *Stypandra glauca*.

**Weed Species:** *Hypochaeris radicata*; *Trifolium arvense*; *Lolium perenne*; *Arctotheca calendula*; *Briza minor*; *Hordeum leporinum*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** *Acacia baileyana* occurs naturally in this community in its original range, although it is a weed elsewhere in Australia..

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 20 +/- 1 (Bos & Lockwood 1996).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Mid-High.

**Vegetation Description:** Mid-high woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Blakely's Red Gum (*Eucalyptus blakelyi*) sometimes with Long-leaved Box (*Eucalyptus goniocalyx*) or Yellow Box (*Eucalyptus melliodora*). The shrub layer is sparse to mid-dense and includes *Bursaria spinosa*, *Acacia buxifolia*, *Lissanthe strigosa*, *Hibbertia obtusiflora* and *Cassinia* spp. Cootamundra Wattle (*Acacia baileyana*) may be a dominant shrub in the Cootamundra region. The ground cover is mid-dense and is dominated by grasses such as *Themeda australis*, *Austrodanthonia setacea* and *Austrostipa densiflora* and forbs such as *Chrysocephalum semipapposum*, *Xerochrysum viscosum*, *Dianella revoluta* var. *revoluta*, *Hydrocotyle laxiflora* and *Stackhousia monogyna*. Occurs on red- brown loamy clay soils derived from granite, granodiorite, sedimentary or metamorphic rocks on steep hillslopes and hillcrests in hilly country from Cootamundra and eastwards in the NSW South-western Slopes Bioregion. Mainly cleared with limited representation in protected areas. A threatened community.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a shrubby understorey.

**Forest Type (RN 17):** 177 - Red Gum-Stringybark (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Community C15 in Bos & Lockwood (1996). Observed around Cootamundra with a variant in the upper Murray River valley near Jingellic (Benson 1999 - 2006). May include Blakely's Red Gum - Yellow Box - Long-leaved Box community mapped in Priday (2004) for Boorowa Shire. Includes part of Biolandscape UlaV39b in Priday (2006). May be part of Vegetation Group 116 in Gellie (2005). Probably part of the BVT 45 in DEC (2006, 2006a). Broad classification requiring more data analysis to define community.

**Interstate Equivalent(s):** Possibly similar to Victoria's EVC 175\_63: Shrubby Granitic Outwash Grassy Woodland.

**Mapped/Modelled:** Current extent and pre-European extent not mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Limited mapping for some reserves. Not mapped over range as of 2007. Bos & Lockwood (1996) sampled some areas.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%).

**Botanical Division:** South Western Slopes (SWS) (>70%).

**Local Govt. Areas:** Cootamundra (30-70%); Junee (1-30%); Gundagai (1-30%); Tumbarumba (1-30%); Boorowa (1-30%); Harden (1-30%).

**CMAs:** Lachlan (30-70%); Murrumbidgee (30-70%); Central West (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Igneous rocks; Metamorphic rocks; Plutonic rocks; Volcanic rocks.

**Lithology:** Andesite; Granite; Granodiorite; Metamorphic rock (unidentified); Rhyolite.

**Great Soil Group:** Brown clay; Grey-brown podzolic soil.

**Soil Texture:** Light clay; Light medium clay.

**Landform Patterns:** Hills.

**Landform Elements:** Hillcrest; Hillslope.

**Land Use:** Grazing.

**Impacts of European Settlement:** Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 60000 ha ±50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate based on landscape position and distribution in relation to clearing patterns.

**Current Extent:** 12000 ha ±50% or 20% ± 70% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Mostly cleared. 91% of a modelled 5761 ha in the Boorowa Shire has been cleared (Priday 2004).

**Conservation Reserves:** Ulandra NR 900 (E3).

**Reserves Total Area:** 900 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Bos & Lockwood (1996) record this community in Ulandra NR and it appears to coincide with community 2 in the vegetation map of the reserve by Black (1992).



**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 7.5% 900 ha ± 30%.

**No. Representatives in Protected Areas:** 1

**Protected Pre-European Extent:** 1.5% which is inadequately protected across distribution.

**Common in 1750:** Code 4a: 1-5% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Few large patches remain. Areas may occur in Jindalee State Forest.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** The shrub understorey varies with aspect, and land use history and across its range. Heavily grazed areas tend to lack shrubs including legumes. More analysis may produce several communities perhaps linked to different substrates from granite in the upper Murray river to metamorphics near Cootamundra. Red Stringybark and Yellow Box dominate on ridges and steeper upper slopes and these areas could be split to form a new community.

**Fire Regime:** Rarely burns due to fragmented and small remnants. Fire may be important as a means to reduce Nitrogen levels that favour the dominance of exotic annual species.

**Adjoining Communities:** Grades into White Box on mid slopes, into Blakely's Red Gum-Yellow Box or Red Box woodland on lower slopes and flats and into Red Stringybark - Black Cypress Pine communities on silicious ridges.

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Clearing for agriculture; Clearing for pine plantations; Nutrient changes through fertilizers or runoff; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/4a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Protect from further clearing. Revegetation programs required on private land. Protect roadside remnants. May be included in EEC listings but this needs assessment.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (308; 177; 347; 316; 356; 353; 372; 373). Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Bos, D. & Lockwood, M. (1996) Flora, fauna and other features of the south west slopes biogeographic region, NSW. Report No. 59, Johnson Centre of Parks, Recreation and Heritage. (Charles Sturt University: Albury); Black, D. (1992) Vegetation of the Ulandra Nature Reserve. Report to NSW National Parks and Wildlife Service, Queanbeyan Office; Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Priday, S. (in prep. 2006) The native vegetation of the New South Wales South Western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254; DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 282

**Common Name:** Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus blakelyi* - *Eucalyptus albens* - *Eucalyptus melliodora* - *Callitris endlicheri* / *Lissanthe strigosa* subsp. *strigosa* - *Acacia implexa* - *Acacia decora* / *Themeda australis* - *Aristida ramosa* - *Austrodanthonia racemosa* - *Chrysocephalum apiculatum*

**Veg. Comm. ID.:** 282 **Original Entry:** J.S Benson 24/01/2006

**Last Modified:** J.S. Benson 3/04/2007

**Photo 1:** ID282a\_PC187-16.jpg *Eucalyptus blakelyi* grassy hill woodland, south of Wagga Wagga, [AGD66 35°14'22"S 147°19'55"E], 15/10/02, Jaime Plaza.



**Photo 2:** ID282b\_benson.jpg *Eucalyptus blakelyi* regrowth with *Lissanthe strigosa* and *Aristida ramosa* on rolling hills in Dananbilla Nature Reserve near Young, [AGD66 34°10.179'S 148°33.714'E], 13/23/2007, J.S. Benson.



**Photo 3:** ID282c\_PC179-16.jpg *Eucalyptus blakelyi* - *E. melliodora* - *Callitris endlicheri* woodland, Koorawatha Cemetery [AGD66 34°03'08"S 148°33'10"E], 12/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Qualitative Estimate)

**Trees:** *Eucalyptus blakelyi*; *Eucalyptus albens*; *Eucalyptus melliodora*; *Callitris endlicheri*; *Eucalyptus bridgesiana*; *Eucalyptus macrorhyncha*.

**Shrubs/Vines/Epiphytes:** *Lissanthe strigosa* subsp. *strigosa*; *Acacia implexa*; *Acacia decora*; *Acacia dealbata*; *Acacia paradoxa*; *Dodonaea viscosa* subsp. *angustifolia*; *Exocarpos cupressiformis*.

**Ground Cover:** *Themeda australis*; *Aristida ramosa*; *Poa sieberiana*; *Arthropodium minus*; *Bulbine bulbosa*; *Dichopogon fimbriatus*; *Wurmbea dioica* subsp. *dioica*; *Chrysocephalum apiculatum*; *Asperula conferta*; *Microlaena stipoides* var. *stipoides*; *Elymus scaber* var. *scaber*; *Geranium retrorsum*; *Geranium solanderi* var. *solanderi*; *Plantago varia*; *Sorghum leiocladum*; *Wahlenbergia luteola*; *Wahlenbergia stricta* subsp. *stricta*; *Juncus remotiflorus*; *Carex appressa*; *Lomandra multiflora* subsp. *multiflora*; *Lomandra filiformis* subsp. *coriacea*; *Pimelea curviflora* var. *curviflora*; *Rumex brownii*; *Diuris punctata* var. *punctata*; *Acaena agnipila*; *Chloris truncata*; *Austrodanthonia racemosa* var. *racemosa*; *Austrodanthonia caespitosa*; *Austrodanthonia auriculata*; *Austrostipa scabra* subsp. *falcata*; *Aristida behriana*; *Bothriochloa macra*; *Carex inversa*; *Hydrocotyle laxiflora*; *Dianella revoluta* var. *revoluta*; *Cheilanthes sieberi* subsp. *sieberi*; *Glycine tabacina*; *Glycine clandestina*.

**Weed Species:** *Aira elegantissima*; *Anagallis arvensis*; *Arctotheca calendula*; *Briza minor*; *Briza maxima*; *Hypochaeris glabra*; *Hypochaeris radicata*; *Petrorhagia nanteuillii*; *Trifolium arvense*; *Trifolium campestre*; *Trifolium glomeratum*; *Vulpia bromoides*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** *Ammobium craspedioides*.

**Threatened Fauna:** Barking Owl.

**Mean Species Richness:** 40 +/- 10 spp. in good sites in 20 x 20 m plots but less in disturbed sites (J. Benson pers. obs).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall grassy woodland co-dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and White Box (*Eucalyptus albens*) often with either Yellow Box (*Eucalyptus melliodora*) or Apple Box (*Eucalyptus bridgesiana*). Stands of Black Cypress Pine (*Callitris endlicheri*) may be present. The shrub layer is absent or sparse and may include wattles such as *Acacia decora*, *Acacia dealbata* or *Acacia implexa*. The heath *Lissanthe strigosa* mat be common. The ground cover is mid-dense to dense dominated by grasses and forbs or weeds in disturbed sites. The ground cover in remnants of good condition include grasses such as *Themeda australis*, *Aristida ramosa*, *Austrodanthonia racemosa* var. *racemosa*, *Austrodanthonia caespitosa*, *Poa sieberiana*, *Chloris truncata*, *Aristida behriana*, *Bothriochloa macra* and *Elymus scaber*. Forbs species include *Arthropodium minus*, *Acaena ovina*, *Bulbine bulbosa*, *Dichopogon fimbriatus*, *Asperula conferta*, *Chrysocephalum apiculatum*, *Hypericum graminum*, *Microseris lanceolata*, *Solenogyne dominii*, *Stackhousia monogyna* and *Wurmbea dioica*. In low lying areas the rush *Juncus remotiflorus* and the sedge *Carex appressa* are often present. Weeds are abundant in most remnants due to ground disturbance, application of fertilizer and sowing of exotic pastures. Occurs on shallow clay loam soils, derived from igneous, volcanic (e.g. rhyolite) or fine grained sedimentary lithologies on hillslopes, hillcrests or footslopes on undulating hills in the NSW South-western Slopes Bioregion including in the Gundagai - Cootamundra - Cowra - Young - Boorowa region. Grades into Grassy White Box woodland (ID266) on better soils and Blakely's Red Gum - Yellow Box woodland (ID277) of Yellow Box woodland (ID276) on flats and lower hills. Mostly cleared and weed infested. A threatened community.

**Level of Classification:** Association.

**Classification Confidence Level:** Low.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 173 - Yellow Box-White Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Listed as an association in Moore (1953a). Includes community 4 in Austin et al. (2000) for Mid-Lachlan region. Vegetation Group 33 in Gellie & Fanning (2004). Probably includes Vegetation Group 159 in Gellie (2005). Probably part of the White Box - Blakely's Red Gum sub-alliance in NSWNPWS (2002a) for Boorowa Shire. Part of White Box Woodland in Friday (2004) for Wagga Wagga region. Includes parts of Biolandscapes EasR24, WagM24, SouV24, WynG24 and UlaV24 in Friday (in prep. 2006). Part of BVT 46 in DEC (2006, 2006a). Community 1a in Porteners (2007).

**Interstate Equivalent(s):** Possibly Victoria: EVC175\_62 Rainshadow Grassy Woodland or EVC 47 Valley Grassy Forest.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Various mapping over range and for some reserves but not mapped overall. Would be difficult to distinguish from other grassy box woodlands using API.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (30-70%); South Eastern Highlands (1-30%).

**IBRA Sub-Region:** Upper Slopes (30-70%); Bondo (1-30%); Murrumbateman (1-30%); Crookwell (1-30%); Orange (1-30%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%); South Western Slopes (SWS) (30-70%).

**Local Govt. Areas:** Bathurst Regional (1-30%); Bland (1-30%); Boorowa (1-30%); Cabonne (1-30%); Coolamon (1-30%); Cootamundra (1-30%); Cowra (1-30%); Forbes (1-30%); Greater Hume (1-30%); Gundagai (1-30%); Harden (1-30%); Junee (1-30%); Mid-Western Regional (1-30%); Orange (1-30%); Upper Lachlan (1-30%); Weddin (1-30%); Tumut (1-30%).

**CMAs:** Central West (1-30%); Lachlan (1-30%); Murray (1-30%); Murrumbidgee (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Igneous rocks; Metamorphic rocks; Sedimentary rocks; Plutonic rocks; Volcanic rocks.

**Lithology:** Granite; Granodiorite; Rhyolite; Sedimentary rock (unidentified); Metamorphic rock (unidentified); Tuff.

**Great Soil Group:** Brown podzolic soil; Yellow podzolic soil.

**Soil Texture:** Clay loam; Light clay.

**Landform Patterns:** Hills; Low hills.

**Landform Elements:** Footslope; Hillcrest; Hillslope.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 70000 ha ±50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate due to lack of mapping - once widespread in the central and south portions of the NSW SWS



Bioregion.

**Current Extent:** 5000 ha  $\pm$ 50% or 7%  $\pm$  70% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Mainly cleared and most remnants contain weed infestations.

**Conservation Reserves:** Mudjarn NR 24 (E1); Ulandra NR 105 (E1); Minjary NP 103 (M); Dananbilla NR 330 (E1); Illunie NR 110 (E1); Koorawatha NR 12 (M); Gungewalla NR 40 (E1).

**Reserves Total Area:** 724 ha.

**No. Representatives in Reserves:** 7

**Protected Area Explanation:** Small area observed in VCA036 by Benson (1999-2009). Minjary NP, Mudjarn NR and Ulandra NRs from veg group 33 in Gellie & Fanning (2004). Includes a component of the Windemere addition to Dananbilla NR (Benson 1999-2007), NSWNPWS (undated e) and community 1a in Porteners (2007). Koorawatha NR, Illunie NR and Gunawalla NR estimates from community 1a in Porteners (2007). VCA037 estimate from NSW DECC file notes but some of this area may be cleared.

**Secure Property Agreements:** VCA036 Monteagle Cemetery VCA 4 (E1); VCA037 VCA 50 (E3).

**Secure PAs Total Area:** 54 ha.

**No. Representatives in Secure Property Agreements:** 2

**Protected Current Extent:** 15.56% 778 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 9

**Protected Pre-European Extent:** 1.11% which is inadequately protected across distribution.

**Common in 1750:** Code 4a: 1-5% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Top Creek Road and Lachlan Valley Way north of Boorowa (Friday in prep. 2006). Various travelling stock reserves such as Hovells Creek and Reids Flat TSRs.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Very poor health as structure and/or composition severely altered. Insufficient biota remain for natural regeneration except some ruderal species.

**Variation & Disturbance:** Ground species vary considerably over range and between sites depending on past disturbance history.

**Fire Regime:** Pre-European fire regime unknown but may have been patch burnt by Aborigines. Fire is now relatively infrequent. Fire may be important as a means to reduce Nitrogen levels that favour the dominance of exotic annual species.

**Adjoining Communities:** Grades into White Box grassy woodland (ID266) and ID277 and Blakely's Red Gum - Yellow Box woodland (ID277) on richer soils.

**Threatening Processes:** Past clearing has resulted in a highly fragmented landscape. High nitrogen levels occur in most places due to high fertilizer use. This has coincided with the introduction of exotic pasture weeds in most remnants and a change from perennial native grasses and forbs to annual introduced species. Few remnants contain a natural shrub or ground cover plant species composition.

**Threatening Process List:** Acid soils due to fertilizer use; Age class of woody vegetation; Clearing for agriculture; Disease and/or dieback (abnormal); Dryland cropping; Firewood collection; Chemical pollution (incl. herbicides, pesticides); Irrigated cropping (incl. horticulture); Nutrient changes through fertilizers or runoff; Salinity; Soil erosion, water: gully, tunnel, landslips; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/4a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Prevent further clearing. Restoration of remnants through fencing and planting of key species. Restore native ground cover by reducing Nitrogen levels in the soil. Management advice is provided in the Grassy White Box Woodlands Information Kit (Lambert & Elix 2002).

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (183; 336; 316; 166; 348; 356; 340; 353; 362; 372; 373; 379; 308). Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); NSW National Parks and Wildlife Service (2002a) The native vegetation of Boorowa Shire (NSW National Parks and Wildlife Service: Hurstville); Friday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Moore, C.W.E. (1953a) The vegetation of the south-eastern Riverina, New South Wales 1: the climax communities. Aust. J. Botany 1: 485-547; Lambert, J. & Elix, J. (2002) Grassy White Box woodlands information kit (Community Solutions: Sydney); Friday, S. (in prep. 2006) The native vegetation of the New South Wales South-western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. Cunninghamia 9(2): 219-254; NSW National Parks and Wildlife Service (undated e) Sandy Creek (Wambanumba) Nature Reserve Proposal (Dananbilla NR). Investigation report (NSWNPWS file M2502); DEC (2006) Reconstructed and extant distribution of native vegetation in the Central West Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); DEC (2006a) Reconstructed and extant distribution of native vegetation in the Lachlan Catchment. Unpublished report (NSW Department of Environment and Conservation: Dubbo); Porteners, M.F. (2007) Vegetation survey and mapping of Koorawatha, Dananbilla, Gungewalla and Illunie Nature Reserves. Report to Department of Environment and Climate Change NSW; Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney).

# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 284

**Common Name:** Red Stringybark - Blakely's Red Gum - tea tree herbaceous swampy valley open forest of the southern NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus macrorhyncha* - *Eucalyptus blakelyi* / *Leptospermum continentale* - *Acacia dealbata* / *Microlaena stipoides* var. *stipoides* - *Hydrocotyle laxiflora* - *Acaena novae-zelandiae* - *Juncus remotiflorus*

**Veg. Comm. ID.:** 284 **Original Entry:** J.S. Benson 6/02/2006

**Photo 1:** ID284a\_PC197-19.jpg *Eucalyptus blakelyi* herbaceous - tea tree valley flat swampy woodland in Murragulrie Flora Reserve, [AGD66 35°29'44"S 147°37'54"E], 17/10/02, Jaime Plaza.



**Photo 2:** ID284b\_PC197-20.jpg *Eucalyptus blakelyi* - *Leptospermum contienale* valley flat swampy woodland in Murragulrie Flora Reserve, [AGD66 35°29'44"S 147°37'54"E], 17/10/02, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus macrorhyncha*; *Eucalyptus blakelyi*; *Eucalyptus goniocalyx*.

**Shrubs/Vines/Epiphytes:** *Leptospermum continentale*; *Acacia dealbata*; *Hibbertia vestita*; *Acrotriche serrulata*.

**Ground Cover:** *Microlaena stipoides* var. *stipoides*; *Acaena novae-zelandiae*; *Hydrocotyle laxiflora*; *Juncus remotiflorus*; *Cheilanthes austrotenuifolia*; *Dichopogon strictus*; *Hypericum gramineum*; *Ranunculus lappaceus*; *Senecio quadridentatus*; *Geranium solanderi* var. *solanderi*; *Dichondra repens*; *Senecio lautus* subsp. *dissectifolius*; *Senecio prenanthoides*; *Ajuga australis*; *Drosera peltata*; *Viola betonicifolia*; *Craspedia variabilis*; *Caladenia carnea* var. *carnea*; *Carex appressa*; *Hypoxis exilis*; *Cymbonotus lawsonianus*.

**Weed Species:** *Anagallis arvensis*; *Hypochoeris radicata*; *Rubus ulmifolius*; *Hypericum perforatum*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall.

**Vegetation Description:** Tall woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Blakely's Red Gum (*Eucalyptus blakelyi*) occasionally with Long-leaved Box (*Eucalyptus goniocalyx*) with a herbaceous ground cover. Shrubs are sparse with some dense patches and include *Acacia dealbata* and *Leptospermum continental*. The ground cover is dense and includes the grass *Microlaena stipoides* var. *stipoides*, forbs such as *Acaena novae-zelandiae*, *Hydrocotyle laxiflora*, *Dichopogon strictus*, *Hypericum gramineum*, *Ranunculus lappaceus*, *Senecio lautus* subsp. *dissectifolius* and *Viola betonicifolia* and sedges such as *Carex appressa* along with the

rush *Juncus remotiflorus*. Occurs on yellow to brown podzolic moist soils derived from adamellite lithology in broad, gently sloping drainage lines in the Murraguldrrie region in the southern part of the NSW South-western Slopes Bioregion. Restricted in extent. Sampled in one flora reserve as of 2007.

**Level of Classification:** Sub-association.

**Classification Confidence Level:** Low.

**Formation Group:** Eucalyptus (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** Eucalyptus woodlands with a grassy understorey.

**Forest Type (RN I7):** .

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Red Stringybark - Long-leaved Box community for Wagga Wagga Shire in Priday (2004). Vegetation group 13 in Gellie & Fanning (2004). Species list noted in Benson (1999-2009). May be part of Vegetation Group 116 in Gellie (2005). Possibly similar to community 30 in Austin et al.(2000) in the Lachlan catchment.

**Interstate Equivalent(s):** Victoria: possibly similar to EVC 80 Spring Soak Woodland.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Mapped in Wagga Wagga Shire by Priday (2004) recognise and map this community but with but it extends beyond that area. Both Priday (2004) and Gellie & Fanning (2004)

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%).

**Botanical Division:** South Western Slopes (SWS) (>70%).

**Local Govt. Areas:** Tumut (30-70%); Wagga Wagga (30-70%); Tumbarumba (1-30%); Greater Hume (1-30%); Gundagai (1-30%).

**CMAs:** Murrumbidgee (>70%); Murray (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Igneous rocks.

**Lithology:** Adamellite.

**Great Soil Group:** Brown podzolic soil; Yellow podzolic soil.

**Soil Texture:** Light clay.

**Landform Patterns:** Hills.

**Landform Elements:** Valley flat.

**Land Use:** Grazing; Nature Conservation.

**Impacts of European Settlement:** Medium reduction (30-70%) in extent and/or range.

**Pre-European Extent:** 3000 ha  $\pm$ 30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Based on area mapped in Priday (2004) and allowing for some area having been cleared.

**Current Extent:** 1000 ha  $\pm$ 30% or 33%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Priday (2004) considers a "moderate" proportion of its original extent has been cleared and converted to pines.

**Conservation Reserves:** Murraguldrrie FR 120 (E1).

**Reserves Total Area:** 120 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Murraguldrrie FR from Priday (2002) minus 10 ha for an estimate of Broad-leaved Sally (ID285) in that reserve.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 12% 120 ha  $\pm$  10%.

**No. Representatives in Protected Areas:** 1

**Protected Pre-European Extent:** 4% which is inadequately protected across distribution.

**Restricted in 1750:** Code 5b: <5% of pre-European extent in protected areas (1,000<area<10,000 ha).

**Key Sites for Protection:** Murraguldrrie region.

**Degree of Fragmentation:** Contiguous stands with high connectivity with >60% extent remaining and low edge to area ratio.

**Recoverability:** Moderate health as structure and/or composition altered. Likely to recover considerably if causal factors and secondary impacts removed.

**Variation & Disturbance:** Limited in extent so floristic variation is minimal.

**Fire Regime:** Rarely burnt now due to surrounding pine plantations and fragmentation.

**Adjoining Communities:** Grades upslope into Red Box (*Eucalyptus polyanthomes*) and Long-leaved Box (*Eucalyptus goniocalyx*) communities. May grade into small patches of Broad-leaved Sally woodland in poorly drained areas (ID285).

**Threatening Processes:** Clearing for pine plantations and weed infestation are the main threats. Although restricted in area much of it is on public land.

**Threatening Process List:** Clearing for agriculture; Clearing for pine plantations; Weed (exotic) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/5b

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Due to its restricted extent limit further areas being cleared for pine plantations.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist and not required.

**Reference List:** (336; 316; 183; 353). NSW National Parks and Wildlife Service (2002a) The native vegetation of Boorowa Shire (NSW National Parks and Wildlife Service: Hurstville); Priday, S. (2004) The native vegetation and threatened species of the City of Wagga Wagga. Unpublished report. (NSW National Parks and Wildlife Service, Southern Region: Queanbeyan); Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra); Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254.



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 301

**Common Name:** Drooping Sheoke - *Ricinocarpus bowmannii* - grasstree tall open shrubland of the Coolac - Tumut Serpentinite Belt

**Scientific Name:** *Eucalyptus nortonii* - *Eucalyptus albens* - *Brachychiton populneus* subsp. *populneus* / *Allocasuarina verticillata* - *Ricinocarpus bowmannii* - *Xanthorrhoea glauca* subsp. *angustifolia* - *Acacia implexa* / *Themeda australis* - *Austrodanthonia laevis* - *Aristida ramosa* var. *ramosa* - *Clematis microphylla* var. *leptophylla*

**Veg. Comm. ID.:** 301 **Original Entry:** J. S. Benson 6/07/2006

**Photo 1:** ID301a\_DX28770.jpg *Allocasuarina verticillata*, *Eucalyptus nortonii*, *Xanthorrhoea glauca* subsp. *angustifolia*, *Ricinocarpus bowmannii* tall shrubland on Coolac serpentinite near Brungle, [AGD66 35°07.734'S 148°17.996'E], 7/5/2006, Jaime Plaza.



**Photo 2:** ID301b\_DX28732.jpg Drooping Sheoak (*Allocasuarina verticillata*) shrubland on Coolac serpentinite showing boundary with non-serpentinite substrate at the base of the hill, Honeysuckle Range near Brungle [AGD66 35°07.998'S 148°17.91'E], 7/5/2006, Jaime Plaza.



**Photo 3:** ID301c\_DX27815.jpg *Allocasuarina verticillata* with *Acacia decora* and *Ricinocarpus bowmannii* on hill slope on Coolac serpentinite above Brungle Gap, [AGD66 35°12.033'S 148°21.257'E], 29/4/2006, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus nortonii*; *Eucalyptus albens*; *Brachychiton populneus* subsp. *populneus*.

**Shrubs/Vines/Epiphytes:** *Allocasuarina verticillata*; *Ricinocarpos bowmanii*; *Xanthorrhoea glauca* subsp. *angustifolia*; *Acacia implexa*; *Acacia decora*; *Exocarpos cupressiformis*; *Acacia penninervis* var. *penninervis*; *Spyridium parvifolium*.

**Ground Cover:** *Themeda australis*; *Aristida ramosa* var. *ramosa*; *Austrodanthonia laevis*; *Clematis microphylla* var. *leptophylla*; *Hypericum gramineum*; *Euchiton gymnocephalus*; *Acaena novae-zelandiae*; *Geranium solanderi* var. *solanderi*; *Bothriochloa macra*; *Poa sieberiana* var. *sieberiana*; *Panicum effusum*; *Austrostipa scabra* subsp. *falcata*; *Viola betonicifolia*; *Dianella revoluta* var. *revoluta*; *Stellaria pungens*; *Lomandra filiformis* subsp. *coriacea*; *Wahlenbergia communis*; *Oxalis exilis*; *Cheilanthes sieberi* subsp. *sieberi*; *Austrodanthonia racemosa* var. *racemosa*; *Austrodanthonia caespitosa*; *Austrodanthonia pilosa*; *Panicum effusum*; *Senecio quadridentatus*; *Ptilotus spathulatus* f. *spathulatus*.

**Weed Species:** *Carthamus lanatus*; *Hypericum perforatum*; *Avena barbata*; *Petrorhagia nanteuilii*; *Briza maxima*; *Hypochaeris radicata*; *Rubus discolor*.

**Weediness:** Medium (5-15%) with <10% cover.

**Threatened Plants:** Possibly contains *Grevillea wilkinsonii* (Makinson 1993) near Gundagai and this species may have been widespread but has been grazed out. *Ricinocarpos bowmanii* and *Spyridium parvifolium* are relatively restricted..

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 20 +/- 5 (J.S. Benson (1999-2009) in 20 X 20 m plot).

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Open Heath.

**Height Class (WH):** Tall.

**Vegetation Description:** A floristically and structurally distinct tall open heath or low sparse woodland dominated by the tall shrub/small tree Drooping Sheoke (*Allocasuarina verticillata*), the shrub *Ricinocarpos bowmanii*, the grasstree *Xanthorrhoea glauca* subsp. *angustifolia* and wattle shrubs such as Hickory (*Acacia implexa*), Western Golden Wattle (*Acacia decora*), *Acacia penninervis* var. *penninervis*, Native Cherry (*Exocarpos cupressiformis*) and the relatively rare *Spyridium parvifolium*. Taller trees are scattered and include Norton's Box (*Eucalyptus nortonii*), White Box (*Eucalyptus albens*) with occasional Kurrajong (*Brachychiton populneus* subsp. *populneus*). Rocks cover about 50% of the ground. The plant species ground cover is sparse on exposed slopes and dense in creeklines. Ground cover species includes grasses such as *Themeda australis*, *Aristida ramosa* var. *ramosa*, *Austrodanthonia laevis*, *Bothriochloa macra*, *Poa sieberiana* var. *sieberiana*, *Panicum effusum* and *Austrostipa scabra* subsp. *falcata*; the climber *Clematis microphylla* var. *leptophylla* is very common; forb species include *Stellaria pungens*, *Hypericum gramineum*, *Euchiton gymnocephalus*, *Acaena novae-zelandiae*, *Geranium solanderi* var. *solanderi*, *Oxalis exilis*, *Senecio quadridentatus* and an eastern occurrence of the semi-arid forb *Ptilotus spathulatus*; the rock fern *Cheilanthes sieberi* subsp. *sieberi* is common. Weeds may be common in heavily grazed locations. They include Saffron Thistle (*Carthamus lanatus*), St John's Wort (*Hypericum perforatum*), wild oat (*Avena barbata*), *Petrorhagia nanteuilii*, *Briza maxima*, *Hypochaeris radicata* and, in gullies, Blackberry (*Rubus discolor*). The endangered shrub *Grevillea wilkinsonii* may have been widespread in this community but has been grazed out. Occurs on shallow dark brown clays being euzozem or red podzolic soils derived from in a 50 kilometre narrow band of serpentinite and associated substrates between Coolac - Gundagai and Tumut in the NSW South-western Slopes Bioregion. A small area may also occur near Talbingo in the South Eastern Highlands Bioregion. The vegetation is structurally and floristically distinct from the surrounding Eucalyptus-dominated grassy box woodlands that occur on non-serpentinite substrates. Restricted in area and mostly cleared, with most areas grazed by sheep. As of 2007, this community was not sampled in any protected area.

**Level of Classification:** Association.

**Classification Confidence Level:** High.

**Formation Group:** Heaths and Shrublands on the Tablelands and Western Slopes of South-eastern Australia.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Cootamundra - Tumut Serpentinite and Ultramafics; .

**NVIS Major Veg Sub-Groups:** Casuarina and Allocasuarina forests and woodlands.

**Forest Type (RN 17):** 224 - Scrub (P); 227 - Grass Tree (P); 174 - White Box-Western boxes (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). A very distinct floristic and structural plant community occurring on Serpentinite substrate. Interaction of serpentine and some dominant plants documented in Lyons et al. (1974). Geology described and partly mapped in Ashley et al. (1971). Soils described by Jenkins (in prep.). Vegetation Group 182 in Gellie (2005). Biolandscape NonS53 in Priday (2006). Species plots recorded by J. Benson (1999-2009) in May 2006. Site data includes CoolacSerp2 and SZ40129.

**Interstate Equivalent(s):** None..

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Four sample plots sample this vegetation as of 2006. Some extent mapping in Priday (2006). The serpentine substrate on which this community occurs is mapped by Ashley et al. (1971) and is shown on geological maps published by the NSW Department Mineral Resources.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%); South Eastern Highlands (1-30%).

**IBRA Sub-Region:** Upper Slopes (>70%); Bondo (1-30%).

**Botanical Division:** South Western Slopes (SWS) (>70%).

**Local Govt. Areas:** Gundagai (30-70%); Tumut (30-70%).

**CMAs:** Murrumbidgee (>70%).

**MD Basin:** Yes.

**Substrate Mass:** Metamorphic rocks.

**Lithology:** Amphibolite; Serpentinite.

**Great Soil Group:** Euzozem; Red podzolic soil.

**Soil Texture:** Clay loam.

**Landform Patterns:** Hills.

**Landform Elements:** Gully; Hillcrest; Hillslope.

**Land Use:** Grazing.

**Impacts of European Settlement:** Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 8500 ha  $\pm$ 30%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** The Coolac to Tumut serpentinite belt is about 55 km long and ranges from 3.5 km to 300 m wide but there are several small outlying areas. Mulvaney et al (2005) map a pre-European extent of 7636 ha in Gundagia Shire with smaller areas in Tumut Shire.

**Current Extent:** 2400 ha  $\pm$ 30% or 28%  $\pm$  50% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate). Mulvaney et al. (2005) map 2013 ha in Gundagai Shire which implies 26% is remaining compared to its pre-European extent. Smaller areas remain in Tumut Shire. Field observations suggest that most of the hills along the serpentinite belt have been cleared for grazing and some recent pine plantations.

**Conservation Reserves:** None.

**Reserves Total Area:** 0 ha.

**No. Representatives in Reserves:** 0

**Protected Area Explanation:** Not known from any protected area as of 2006, however a small area of serpentinite occurs above Talbingo Dam in Bago State Forest near to the boundary of Kosciuszko National Park. At least one PVP incentive payment is known to have been made as of 2007 to limit grazing on the Mooney Range north Coolac near the Hume Highway.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** Not known to be protected.

**No. Representatives in Protected Areas:** 0

**Protected Pre-European Extent:** 0% which is inadequately protected across distribution.

**Restricted in 1750:** Code 5b: <5% of pre-European extent in protected areas (1,000<area<10,000 ha).

**Key Sites for Protection:** Coolac - Tumut Serpentine belt including the roadside and adjacent hill at Brungle Creek crossing on the Wee Jasper - Tumut Road and remnants along the Honeysuckle Range to the west near Brungle and northeast of Tumut. Small outliers may also occur near Gundagai.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** There are marked changes in the species composition from hillside vegetation to gullies or along creeks where sedgeland and *Leptospermum* may occur and grasstrees are less abundant. *Allocasuarina verticillata* tends to be present throughout its range. Eucalyptus species vary from place to place.

**Fire Regime:** Unknown, but is now rare due to the rocky terrain, lack of ground cover due to sheep grazing and the open nature of the shrubland. However, occasional fire (30-100 years) may be important for the germination and establishment of *Allocasuarina* and *Acacia* as long as the grazing intensity is low enough to allow seedlings to survive.

**Adjoining Communities:** Most of the community grades into White Box (*Eucalyptus albens*) (ID266) or Yellow Box (*Eucalyptus melliodora*) (ID277) grassy woodland on soils derived from fine-grained metamorphics adjacent to the serpentinite.

**Threatening Processes:** Further clearing or overgrazing of the hills may threaten the survival of many species in this restricted community. Weeds have invaded disturbed sites along gullies in particular. Localised mining and pine plantations on ridgelines have destroyed some areas. Pines do not grow well on serpentinite, yet have been planted in the past. There is a demand for grasstrees in the horticultural trade. Some root fungi are known to kill grasstrees.

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Clearing for pine plantations; Disease and/or dieback (abnormal); Mining or quarrying; Overharvesting or collecting of key species; *Phytophthora* dieback; Sedimentation; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Unsustainable grazing by introduced animals.

**Threat Category:** Endangered.

**Threat/Protected Area Code:** E/5b

**Threat Criteria:** 1; 4; 3.

**Planning Controls:**

**Planning and Management:** Protect remnants on Coolac serpentinite in reserves and/or under secure property agreements. Protect stands from stock grazing, too frequent fire and further pine plantings. Targeted weeding of some locations may be required. This community should be considered as a threatened community given its rarity and remaining extent.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (352; 353; 351; 308; 354; 356; 365; 369). Ashley, P.M., Chenhall, B.E., Cremer, P.L. & Irving, A.J. (1971) The geology of the Coolac Serpentine and adjacent rocks east of Tumut, New South Wales. *Journal and Proceedings of the Royal Society of New South Wales* 104: 11-29; Gellie, N.J.H. (2005) Native vegetation of the Southern Forests: South-east Highlands, Australian Alps, South-west Slopes and SE Corner bioregions. *Cunninghamia* 9(2): 219-254; Lyons, M.T., Brooks, R.R. & Craig, D.C. (1974) The influence of soil composition on the vegetation of the Coolac Serpentine Belt in New South Wales. *Journal and Proceedings, Royal Society of New South Wales* 107: 67-75; Benson, J.S. (1999-2006) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Makinson R.O. (1993) *Grevillea wilkinsonii* (Proteaceae) a new species from southern New South Wales. *Telopea* 5(2): 351-358; Priday, S. (in prep. 2006) The native vegetation of the New South Wales South-western Slopes Bioregion (Lachlan, Murrumbidgee and Murray Catchments). Unpublished report to DEC Southern Office Queanbeyan; Mulvaney, M., Boak, M., Priday, S., Hudson, K. and Crane, M. (2005). The Native Vegetation of Gundagai Shire. NSW Department of Environment and Conservation, Queanbeyan; Jenkins, B.R. (in prep). Soil Landscapes of the Tumut 1:100 000 Sheet (NSW Department of Natural Resources: Sydney).



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 316

**Common Name:** Norton's Box - Red Box - Red Stringybark +/- Nodding Flax Lily forb-grass open forest mainly on the Tumut region

**Scientific Name:** *Eucalyptus nortonii* - *Eucalyptus polyanthemos* subsp. *vestita* - *Eucalyptus macrorhyncha* / *Acacia buxifolia* subsp. *buxifolia* - *Brachyloma daphnoides* subsp. *daphnoides* - *Acacia verniciflua* - *Hibbertia obtusifolia* / *Stypandra glauca* - *Poa sieberiana* - *Austrodanthonia racemosa* var. *racemosa* - *Cheilanthes austrotenuifolia*

**Veg. Comm. ID.:** 316 **Original Entry:** J.S. Benson 13/10/2006

**Photo 1:** ID316a\_PC194-20.jpg *Eucalyptus nortonii* - *E. macrorhyncha* - *E. polyanthemos* - *Stypandra glauca* woodland on hillcrests in Minjary National Park, [AGD66 35°14'31"S 148°07'34"E], 16/10/02, Jaime Plaza.



**Photo 2:** ID316b\_PC194-18.jpg *Eucalyptus nortonii* - *Eucalyptus polyanthemos* grass - forb woodland in Minjary National Park, [AGD66 35°13'39"S 148°07'33"E], 16/10/02, Jaime Plaza.



**Photo 3:** ID316c\_DX28720.jpg Heavily grazed Norton's Box (*Eucalyptus nortonii*) - Red Box (*Eucalyptus polyanthemos*) open forest with a rich forb-grass ground cover on Crown Land on Yarch Road Darlow Creek near Adelong, [AGD66 35°20.488'S 147°57.540'E], 6/5/2006, Jaime Plaza.



**Characteristic Vegetation:** (Quantitative Data)

**Trees:** *Eucalyptus nortonii*; *Eucalyptus polyanthemos*; *Eucalyptus macrorhyncha*; *Callitris endlicheri*; *Eucalyptus blakelyi*; *Brachychiton populneus* subsp. *populneus*; *Eucalyptus melliodora*.

**Shrubs/Vines/Epiphytes:** *Acacia buxifolia* subsp. *buxifolia*; *Brachyloma daphnoides* subsp. *daphnoides*; *Acacia verniciflua*; *Acacia implexa*; *Hibbertia obtusifolia*; *Acacia gunnii*; *Dodonaea viscosa* subsp. *cuneata*; *Dillwynia sericea*.

**Ground Cover:** *Stypandra glauca*; *Poa sieberiana*; *Austrodanthonia racemosa* var. *racemosa*; *Cheilanthes austrotenuifolia*; *Dichelachne sieberiana*; *Elymus scaber* var. *scaber*; *Bothriochloa macra*; *Poranthera microphylla*; *Bulbine bulbosa*; *Euchiton gymnocephalus*; *Daucus glochidiatus*; *Cynoglossum australe*; *Carex breviculmis*; *Wahlenbergia multicaulis*; *Lomandra filiformis* subsp. *filiformis*; *Lomandra filiformis* subsp. *coriacea*; *Oxalis perennans*; *Hydrocotyle laxiflora*; *Glycine clandestina*; *Dichondra repens*; *Microtis unifolia*; *Stellaria pungens*; *Hypericum gramineum*; *Geranium retrorsum*; *Gonocarpus tetragynus*; *Cymbonotus preissianus*; *Luzula densiflora*; *Wahlenbergia stricta* subsp. *stricta*; *Microseris lanceolata*; *Acaena echinata*; *Scutellaria humilis*; *Dianella revoluta* var. *revoluta*; *Senecio quadridentatus*; *Senecio hispidulus* var. *hispidulus*.

**Weed Species:** *Trifolium striatum*; *Bromus diandrus*; *Cirsium vulgare*; *Anagallis arvensis*; *Centaurium erythraea*; *Hypericum perforatum*; *Trifolium campestre*; *Trifolium arvense*; *Trifolium angustifolium*; *Petrorhagia nanteuilii*; *Vulpia bromoides*; *Briza maxima*; *Anthoxanthum odoratum*; *Hypochaeris glabra*; *Hypochaeris radicata*; *Aira elegantissima*.

**Weediness:** High (15-30%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 35 spp. +/- 10 20 X 20 m plot (Gellie & Fanning 2004). Rich forb component..

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Open Forest; Woodland.

**Height Class (WH):** Mid-High.

**Vegetation Description:** Mid-high open forest to woodland dominated by Norton's Box (*Eucalyptus nortonii*), Red Box (*Eucalyptus polyanthemos* subsp. *polyanthemos*) and Red Stringybark (*Eucalyptus macrorhyncha*) with patches of *Callitris endlicheri* or more exposed sites. Scattered Kurrajong (*Brachychiton populneus* subsp. *populneus*) may be present. The shrub layer is very sparse and includes *Acacia buxifolia* subsp. *buxifolia*, *Brachyloma daphnoides* subsp. *daphnoides*, *Acacia verniciflua*, *Acacia implexa*, *Acacia gunnii*, *Hibbertia obtusifolia* and *Dodonaea viscosa* subsp. *cuneata*. The ground cover is dense contain a rich composition of forbs and grasses although it may be weedy in places. Grasses include *Poa sieberiana*, *Austrodanthonia racemosa* var. *racemosa*, *Dichelachne sieberiana* and *Elymus scaber* var. *scaber*. Forbs include Nodding Flax Lily (*Stypandra glauca*) which is very common along with *Poranthera microphylla*. *Bulbine bulbosa*, *Euchiton gymnocephalus*, *Daucus glochidiatus*, *Cynoglossum australe*, *Wahlenbergia* spp., *Oxalis perennans*, *Hydrocotyle laxiflora*, *Glycine clandestina*, *Dichondra repens*, *Microtis unifolia*, *Stellaria pungens*, *Hypericum gramineum*, *Geranium retrorsum*, *Gonocarpus tetragynus*, *Cymbonotus preissianus* and *Senecio* spp. The rock fern *Cheilanthes austrotenuifolia* is common. The sedge *Carex breviculmis* and rush *Luzula densiflora* are often present along with mat-rushes *Lomandra filiformis* subsp. *filiformis* and *Lomandra filiformis* subsp. *coriacea* occur. The climber *Glycine clandestina* is common. Occurs on shallow sandy loam soils derived from granite on steep hillslopes and hillcrests in hill landform patterns on the Minjary Range and surrounding region north of Tumut in the upper slope sub-region of the NSW South-western Slopes Bioregion. Cleared over much of its distribution but sampled in Minjary National Park.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* forests with a grassy understorey.

**Forest Type (RN 17):** 99 - Red Box (P).

**Authority(s):** (Quantitative Data). Includes vegetation groups 25 and 36 (Gellie & Fanning 2004) sites include SWSMNJ23, 28, 26. Possibly community 42 in Austin et al. (2000). Checked by Benson (1999-2009).

**Interstate Equivalent(s):** Victoria: possible part of the broadly classified EVC 22: Grassy Dry Forest.

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Adequate.

**Mapping Info:** Mapped and sampled in Minjary National Park by Gellie & Fanning but not mapped over full range as of 2007.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%).

**Botanical Division:** South Western Slopes (SWS) (>70%).

**Local Govt. Areas:** Gundagai (30-70%); Tumut (30-70%).

**CMAs:** Murrumbidgee (>70%).

**MD Basin:** Yes.

**Substrate Mass:** Plutonic rocks.

**Lithology:** Granite.

**Great Soil Group:** Lithosol.

**Soil Texture:** Sandy clay loam; Sandy loam.

**Landform Patterns:** Hills.

**Landform Elements:** Hillcrest; Hillslope.

**Land Use:** Grazing; Nature Conservation.

**Impacts of European Settlement:** Medium reduction (30-70%) in extent and/or range.

**Pre-European Extent:** 8000 ha ±30%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Would have been mainly restricted to region between Gundagai and Tumut.

**Current Extent:** 3000 ha ±30% or 38% ± 50% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from pre-European map: part range). Most hills in the region have been cleared.

**Conservation Reserves:** Minjary NP 750 (E2).

**Reserves Total Area:** 750 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Minjary NP estimate from veg. groups 35 and 36 in Gellie & Fanning (2004).

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** 25% 750 ha ± 30%.

**No. Representatives in Protected Areas:** 1

**Protected Pre-European Extent:** 9.37% which is inadequately protected across distribution.

**Restricted in 1750:** Code 4b: 5-15% of pre-European extent in protected areas (1,000<area<10,000 ha).

**Key Sites for Protection:** An excellent stand occurs on a small patch of Crown land on the Darlows Creek - Yarch Road north west of Tumut, This should be protected.

**Degree of Fragmentation:** Human induced fragmented stands with <60% >30% extent remaining and moderate edge to area ratio.

**Recoverability:** Moderate health as structure and/or composition altered. Likely to recover considerably if causal factors and secondary impacts removed.

**Variation & Disturbance:** Restricted in extent and therefore limited variation but fire regimes would alter composition of shrubs and ground flora. Some sites have more shrubs but this may depend on grazing regimes.

**Fire Regime:** Unknown but some landholders may burn regularly.

**Adjoining Communities:** A shrubby community with similar tree composition (ID306) occurs to the south-east in Wereboldera SCA near Tumut. Grades into White Box grassy woodland (ID266) on deeper soils.

**Threatening Processes:** overclearing in the past has fragmented links between hills where this community occurs. Some areas on private land are susceptible to overgrazing and sheet soil erosion during drought. Localised weed invasion.

**Threatening Process List:** Clearing for agriculture; Inappropriate fire regimes; Nutrient changes through fertilizers or runoff; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/4b

**Threat Criteria:** 1; 2.

**Planning Controls:**

**Planning and Management:** Prevent further clearing or over-grazing of hills with this community. Avoid burning too often although occasional fire may be appropriate management.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist and not required.

**Reference List:** (308; 340; 183). Benson, J.S. (1999-2006) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Austin, M.P., Cawsey, E.M., Baker, B.L., Yialeloglou, M.M., Grice, D.J. & Briggs, S.V. (2000) Predicted vegetation cover in the central Lachlan region. National Heritage Trust Project AA 1368.97. (CSIRO Division of Wildlife and Ecology: Canberra).



# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 347

**Common Name:** White Box - Blakely's Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus albens* - *Eucalyptus blakelyi* - *Eucalyptus macrorhyncha* / *Brachyloma daphnoides* subsp. *daphnoides* - *Acacia paradoxa* - *Dillwynia sericea* - *Xanthorrhoea glauca* subsp. *angustifolia* / *Austroanthonia eriantha* - *Poa sieberiana* var. *sieberiana* - *Stypandra glauca* - *Cheilanthes austrotenuifolia*

**Veg. Comm. ID.:** 347 **Original Entry:** J.S. Benson 30/04/2007

**No Photo Available**

**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus albens*; *Eucalyptus blakelyi*; *Eucalyptus macrorhyncha*; *Eucalyptus sideroxyylon*.

**Shrubs/Vines/Epiphytes:** *Brachyloma daphnoides* subsp. *daphnoides*; *Acacia paradoxa*; *Dillwynia sericea*; *Xanthorrhoea glauca* subsp. *angustifolia*; *Hibbertia obtusifolia*; *Cassinia aculeata*; *Daviesia leptophylla*; *Acrotriche serrulata*; *Hibbertia riparia*; *Platylobium formosum* subsp. *formosum*; *Pultenaea foliolosa*; *Melichrus urceolatus*; *Acacia buxifolia* subsp. *buxifolia*; *Acacia dealbata*; *Acacia gunnii*; *Acacia implexa*.

**Ground Cover:** *Austroanthonia eriantha*; *Poa sieberiana* var. *sieberiana*; *Stypandra glauca*; *Lomandra filiformis* subsp. *filiformis*; *Cheilanthes austrotenuifolia*; *Hydrocotyle laxiflora*; *Xerochrysum viscosum*; *Senecio quadridentatus*; *Hypericum gramineum*; *Goodenia hederacea* subsp. *hederacea*; *Gonocarpus tetragynus*; *Haloragis heterophylla*; *Cheiranthra cyanea* var. *cyanea*; *Opercularia aspera*; *Dianella revoluta* var. *revoluta*; *Lomandra multiflora* subsp. *multiflora*; *Cheilanthes sieberi* subsp. *sieberi*; *Austrostipa densiflora*; *Austroanthonia racemosa* var. *racemosa*; *Austroanthonia setacea*; *Aristida ramosa* var. *ramosa*; *Austrostipa scabra* subsp. *falcata*; *Triptilodiscus pygmaeus*; *Dichopogon strictus*; *Burchardia umbellata*; *Microseris lanceolata*; *Glycine clandestina*; *Wahlenbergia stricta* subsp. *stricta*; *Oxalis perennans*; *Lepidosperma laterale*; *Wurmbea dioica* subsp. *dioica*; *Senecio prenanthoides*; *Senecio bathurstianus*; *Hardenbergia violacea*.

**Weed Species:** *Hypochoeris radicata*; *Petrorhagia nanteuilii*; *Carduus pycnocephalus*; *Carduus pycnocephalus*; *Cirsium vulgare*; *Centaurium erythraea*; *Aira elegantissima*; *Briza maxima*; *Briza minor*; *Anagallis arvensis*; *Vulpia muralis*; *Vulpia bromoides*; *Taraxacum officinale*; *Trifolium campestre*; *Hypochoeris glabra*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** Not assessed.

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Mid-High; Tall.

**Vegetation Description:** Mid-high to tall woodland or open forest dominated White Box (*Eucalyptus albens*), Blakely's Red Gum (*Eucalyptus blakelyi*) with Red Stringybark (*Eucalyptus macrorhyncha*) and occasionally Mugga Ironbark (*Eucalyptus sideroxyylon*). The shrub layer may be sparse to mid-dense in less grazed sites but absent or very sparse in heavily grazed areas. It includes *Cassinia aculeata*, *Hibbertia obtusifolia*, *Hibbertia riparia*, *Dillwynia sericea*, *Daviesia leptophylla*, *Acrotriche serrulata*, *Brachyloma daphnoides* subsp. *daphnoides*, *Platylobium formosum* subsp. *formosum*, *Pultenaea foliolosa*, *Melichrus urceolatus*, *Acacia buxifolia* subsp. *buxifolia*, *Acacia dealbata*, *Acacia gunnii*, *Acacia implexa* and *Acacia paradoxa*. The ground cover is usually sparse and includes the grasses *Austroanthonia eriantha*, *Austroanthonia racemosa* var. *racemosa*, *Poa sieberiana* var. *sieberiana* and *Austrostipa densiflora*. along with the mat-rushes *Lomandra filiformis* subsp. *filiformis* and *Lomandra multiflora* subsp. *multiflora*. Forb species include *Hydrocotyle laxiflora*, *Xerochrysum viscosum*, *Senecio quadridentatus*, *Hypericum gramineum*, *Goodenia hederacea* subsp. *hederacea*, *Gonocarpus tetragynus*, *Cheiranthra cyanea* var. *cyanea*, *Opercularia aspera*, *Dianella revoluta* var. *revoluta* and *Stypandra glauca*. The rock fern *Cheilanthes sieberi* subsp. *sieberi* may be present. Occurs on shallow, often stony clay loam soils mainly derived from fine-grained metamorphic rocks on hillslopes and gullies in hill landscape patterns in the central part of the upper slopes sub-region of the NSW South-western Slopes Bioregion, generally north of the Murray CMA area. Mostly cleared and therefore a threatened community.

**Level of Classification:** Association.

**Classification Confidence Level:** Low.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a shrubby understorey.

**Forest Type (RN 17):** 176 - White Box-Stringybark (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Includes Vegetation Group 29 in Gellie & Fanning (2004) including sites SWSEI02 and SWSEI06. Species listed for Tarcutta Bush Heritage Reserve in ABHF (2001).

**Interstate Equivalent(s):** None.

**Mapped/Modelled:** Current extent and pre-European extent not mapped or modelled.

**Mapping Info:** ADS-40 mapping of some areas around Wagga Wagga as of 2010 except but needs more plot sampling.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%).

**Botanical Division:** Central Western Slopes (CWS) (1-30%); South Western Slopes (SWS) (30-70%).

**Local Govt. Areas:** Tumut (1-30%); Wagga Wagga (1-30%); Junee (1-30%); Gundagai (1-30%); Cootamundra (1-30%).

**CMAs:** Murrumbidgee (30-70%); Lachlan (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Metamorphic rocks.

**Lithology:** Metamorphic rock (unidentified).

**Great Soil Group:** Brown podzolic soil.

**Soil Texture:** Clay loam.

**Landform Patterns:** Hills.

**Landform Elements:** Gully; Hillslope.

**Land Use:** Grazing.

**Impacts of European Settlement:** Medium reduction (30-70%) in extent and/or range.

**Pre-European Extent:** 12000 ha  $\pm$ 50%. Expert estimate not based on any mapped vegetation.

**Pre-European Extent Comments:** Estimate only

**Current Extent:** 4500 ha  $\pm$ 50% or 38%  $\pm$  80% of pre-European extent remaining.

**Current Extent Comments:** (Expert estimate).

**Conservation Reserves:** Ellerslie NR 200 (E3).

**Reserves Total Area:** 200 ha.

**No. Representatives in Reserves:** 1

**Protected Area Explanation:** Ellerslie NR from ADS-40 mapping 2010 but estimate only.

**Secure Property Agreements:** Tarcutta Hills BHR 130 (E2).

**Secure PAs Total Area:** 130 ha.

**No. Representatives in Secure Property Agreements:** 1

**Protected Current Extent:** 7.33% 330 ha  $\pm$  30%.

**No. Representatives in Protected Areas:** 2

**Protected Pre-European Extent:** 2.75% which is inadequately protected across distribution.

**Common in 1750:** Code 4a: 1-5% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Hills in the Tarcutta and Gundagai regions.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Shrub layer density and composition varies with grazing history and location on hillslopes versus gullies.

**Fire Regime:** Unknown but probably now rare due to fragmentation.

**Adjoining Communities:** Grades into grassy White Box woodland (ID266) on deeper loam soils in broad gully heads or on lower slopes. Grades into Mugga Ironbark - Inland Scribbly gum open forest (ID289) on ridges. Some similarities with the shrubby White Box - White Cypress Pine - Blakely's Red Gum woodland to the east around Wagga Wagga (ID346) and the shrubby White Box community to the south of Tarcutta to Albury (ID269).

**Threatening Processes:** Highly fragmented due to past extensive clearing. Remnants are heavily grazed. Annual exotic weeds have invaded some remnants but less so than the more grassy White Box woodland (ID266).

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Disease and/or dieback (abnormal); Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Weed (exotic) invasion.

**Threat Category:** Vulnerable.

**Threat/Protected Area Code:** V/4a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Prevent further clearing and allow regeneration in remnants.

**Listed Under Legislation:** Listed TSC Act, E: White Box Yellow Box Blakely's Red Gum Woodland (Part); Listed EPBC Act, CE: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part).

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (340; 344). Gellie, N. & Fanning, M. (2004) Final report of vegetation ecosystems in new and existing conservation reserves, south west slopes region 2002-2004, version 3. Report to NSW Department of Environment and Conservation: Queanbeyan; Australian Bush Heritage Fund (2001) Tarcutta Hills Reserve Management Plan (Australian Bush Heritage Fund: Melbourne).





# NSW Vegetation Classification - Vegetation ID

## Vegetation Community ID 426

**Common Name:** Red Box - White Box +/- Red Stringybark hill woodland in the NSW South-western Slopes Bioregion

**Scientific Name:** *Eucalyptus polyanthemos* subsp. *polyanthemos* - *Eucalyptus albens* - *Brachychiton populneus* subsp. *populneus* - *Eucalyptus macrorhyncha* / *Acacia implexa* - *Lissanthe strigosa* subsp. *strigosa* - *Hibbertia obtusifolia* - *Amyema miquelii* / *Austrodanthonia racemosa* var. *racemosa* - *Austrostipa densiflora* - *Cheilanthes sieberi* subsp. *sieberi* - *Austrostipa scabra* subsp. *falcata*

**Veg. Comm. ID.:** 426 **Original Entry:** J.S. Benson 26/05/2009

**Photo 1:** ID426a\_benson DSCN0011.jpg Red Box (*Eucalyptus polyanthemos*) - White Box (*Eucalyptus albens*) woodland on a roadside north of Cootamundra in the south western slopes, [AGD66 34°56'24.7"S 148°03'11.1"E], 22/5/2009, J.S. Benson.



**Photo 2:** ID426b\_benson DSCN0016.jpg Isolated Red Box (*Eucalyptus polyanthemos*) tree in a cleared paddock north of Cootamundra in the south western slopes, [AGD66 34°57'25.3"S 148°03'13.5"E], 22/5/2009, J.S. Benson.



**Photo 3:** ID426c\_BBSMAY09\_1610.jpg Red Box (*Eucalyptus polyanthemos*) - White Box (*Eucalyptus albens*) low woodland on steep hill composed of phyllite on Mount View property south of Spicers Creek near Gulgong SWS Bioregion [AGD66 32°24'56.9"S, 149°9'31.9"E], 12/5/09, Jaime Plaza.



**Characteristic Vegetation:** (Combination of Quantitative Data and Qualitative Estimate)

**Trees:** *Eucalyptus polyanthemos subsp. polyanthemos*; *Eucalyptus albens*; *Brachychiton populneus subsp. populneus*; *Eucalyptus macrorhyncha*; *Eucalyptus sideroxylon*.

**Shrubs/Vines/Epiphytes:** *Acacia implexa*; *Lissanthe strigosa subsp. strigosa*; *Hibbertia obtusifolia*; *Dillwynia sericea*; *Amyema miquelii*.

**Ground Cover:** *Austrostipa scabra subsp. falcata*; *Lomandra filiformis subsp. coriacea*; *Aristida personata*; *Austrostipa densiflora*; *Austrodanthonia racemosa var. racemosa*; *Themeda australis*; *Daucus glochidiatus*; *Microlaena stipoides var. stipoides*; *Carex inversa*; *Austrodanthonia pilosa*; *Goodenia hederacea subsp. hederacea*; *Juncus subsecundus*; *Juncus homalocaulis*; *Cheilanthes sieberi subsp. sieberi*; *Einadia polygonoides*; *Cheilanthes distans*; *Euchiton sphaericus*; *Lagenifera stipitata*; *Oxalis radicata*; *Rumex brownii*; *Veronica plebeia*; *Eragrostis parviflora*; *Elymus scaber var. scaber*; *Panicum effusum*.

**Weed Species:** *Trifolium glomeratum*; *Trifolium arvense*.

**Weediness:** Medium (5-15%) with 10-30% cover.

**Threatened Plants:** Not assessed.

**Threatened Fauna:** Not assessed.

**Mean Species Richness:** 19 +/- 5 in 20 x 20 m plots in FG 20 in Ismay et al. (2004)..

**Rainforest Structure (Webb):** Not applicable.

**Structure (WH):** Woodland.

**Height Class (WH):** Tall; Mid-High.

**Vegetation Description:** Tall to mid-high woodland dominated by Red Box (*Eucalyptus polyanthemos subsp. polyanthemos*) often with White Box (*Eucalyptus albens*), Kurrajong (*Brachychiton populneus subsp. populneus*) or Red Stringybark (*Eucalyptus macrorhyncha*). Mugga Ironbark may be present. The mistletoe *Amyema miquelii* is often abundant. The shrub layer is sparse to very sparse and includes species such as *Acacia implexa*, *Lissanthe strigosa subsp. strigosa*, *Hibbertia obtusifolia* or *Dillwynia sericea*. The ground is often bare or mostly covered with litter. Grass species include *Austrostipa scabra subsp. falcata*, *Aristida personata*, *Austrostipa densiflora*, *Austrodanthonia racemosa var. racemosa*, *Themeda australis* and *Microlaena stipoides var. stipoides*. The sedge *Carex inversa* may be present along with species of *Juncus*. Forb species include *Daucus glochidiatus*, *Goodenia hederacea subsp. hederacea*, *Einadia polygonoides*, *Euchiton sphaericus*, *Lagenifera stipitata*, *Oxalis radicata*, *Rumex brownii* and *Veronica plebeia*. Occurs on shallow loam to clay soils often derived from shale or phyllite substrates on hills from north of Wellington in the north to around Cootamundra in the south in the NSW South-western Slopes Bioregion. Most of the original extent has been cleared, remnants are mostly in poor condition and subject to heavy stock grazing. Overall, this community is critically endangered with few if any examples in protected areas as of 2009.

**Level of Classification:** Association.

**Classification Confidence Level:** Medium.

**Formation Group:** *Eucalyptus* (Mostly Grassy) Box Woodlands of the Tablelands and Western Slopes.

**State Veg Map (Keith 2004):** Western Slopes Grassy Woodlands.

**State Landscape (Mitchell 2002):** Not Assessed.

**NVIS Major Veg Sub-Groups:** *Eucalyptus* woodlands with a grassy understorey.

**Forest Type (RN 17):** 99 - Red Box (P).

**Authority(s):** (Combination of Expert Opinion and Quantitative Data). Map unit LOW8 being floristic group 20 in Ismay et al. (2004) at northern limit north of Wellington. Some similarity but differs to the White Box - Red Box woodland on sandstone in the western Blue Mountains MU83 in Somerville (2009). Remnants field checked in Cootamundra region by J.S. Benson and DECC southern mapping team (May 2009).

**Interstate Equivalent(s):** None (may be similar to and EVC in Victoria).

**Mapped/Modelled:** Current extent partly mapped or modelled.

**Plot Sampling:** Inadequate.

**Mapping Info:** Not mapped over range as of 2009. Requires more sampling over range. Small area mapped near Gulgong in Ismay et al. (2004). Cootamundra remnants are being mapped using AS40 imagery during 2009.

**Climate Zone:** Temperate: no dry season (warm summer).

**IBRA Bioregion (v6):** NSW South-western Slopes (>70%).

**IBRA Sub-Region:** Upper Slopes (>70%).

**Botanical Division:** Central Western Slopes (CWS) (30-70%).

**Local Govt. Areas:** Bathurst Regional (1-30%); Cootamundra (1-30%); Cowra (1-30%); Gundagai (1-30%); Harden (1-30%); Junee (1-30%); Mid-Western Regional (1-30%); Young (1-30%); Cabonne (1-30%).

**CMAs:** Central West (1-30%); Murrumbidgee (1-30%); Lachlan (1-30%).

**MD Basin:** Yes.

**Substrate Mass:** Metamorphic rocks; Sedimentary rocks.

**Lithology:** Chert; Metamorphic rock (unidentified); Mudstone; Phyllite; Schist; Shale.

**Great Soil Group:** Brown clay; Brown earth; Brown podzolic soil.

**Soil Texture:** Clay loam; Clay loam, sandy.

**Landform Patterns:** Hills; Low hills.

**Landform Elements:** Hillslope.

**Land Use:** Cropping and Horticulture; Grazing.

**Impacts of European Settlement:** Major alteration of species composition; Major reduction (>70%) in extent and/or range.

**Pre-European Extent:** 30000 ha ±50%. Estimated from extant vegetation maps: part range.

**Pre-European Extent Comments:** Confined to patches on steep hills from in the upper slopes sub-region of the NSW South western Slopes Bioregion. Mostly cleared.

**Current Extent:** 3000 ha ±50% or 10% ± 80% of pre-European extent remaining.

**Current Extent Comments:** (Estimated from mapped extant vegetation: part range). Small patches (e.g. 137 ha on Cobbora 1:100,000 map sheet) remain. Some areas remain near Cootamundra.

**Conservation Reserves:** None.

**Reserves Total Area:** 0 ha.

**No. Representatives in Reserves:** 0

**Protected Area Explanation:** None known as of 2009.

**Secure Property Agreements:** None.

**Secure PAs Total Area:** 0 ha.

**No. Representatives in Secure Property Agreements:** 0

**Protected Current Extent:** Not known to be protected.

**No. Representatives in Protected Areas:** 0

**Protected Pre-European Extent:** 0% which is inadequately protected across distribution.

**Common in 1750:** Code 5a: <1% of pre-European extent in protected areas (>10,000 ha).

**Key Sites for Protection:** Roadsides on hills around Cootamundra. Stands west of Gulgong. Other areas require survey.

**Degree of Fragmentation:** Human induced highly fragmented small stands with <30% extent remaining and high edge to area ratio.

**Recoverability:** Poor health as structure and/or composition significantly altered. But sufficient biota remain for natural regeneration if causal factors and their secondary impacts removed and dynamic processes reinstated.

**Variation & Disturbance:** Reasonably consistent floristic composition and landscape position over range.

**Fire Regime:** Rarely burns today due to extensive clearing and fragmentation along with heavy grazing of ground cover reducing biomass.

**Adjoining Communities:** Grades into grassy White Box woodland (ID266) on better soils throughout range, into Blakely's Red Gum - Red Stringybark woodland (ID280) around Cootamundra and into Tumbledown Red Gum (*Eucalyptus dealbata*) woodlands on some poorer soils on acid volcanics.

**Threatening Processes:** Mostly cleared in the past with remnants over-grazed and affected by fertiliser use with some weed invasion. Many trees are dying back due to the impacts of the 2004-9 drought.

**Threatening Process List:** Age class of woody vegetation; Clearing for agriculture; Dryland cropping; Chemical pollution (incl. herbicides, pesticides); Nutrient changes through fertilizers or runoff; Soil erosion, water: gully, tunnel, landslips; Soil erosion, water: sheet erosion; Unsustainable grazing and trampling by stock; Unsustainable grazing by introduced animals; Weed (exotic) invasion.

**Threat Category:** Critically Endangered.

**Threat/Protected Area Code:** CE/5a

**Threat Criteria:** 1; 4.

**Planning Controls:**

**Planning and Management:** Protect some areas in protected areas. Prioritise for fencing off remnants under catchment management plans.

**Listed Under Legislation:** None.

**Recovery Plan:** Doesn't exist, but required.

**Reference List:** (424; 308; 464). Ismay, K., Lewer, S., Deluca, S., Powrie, S., McKenzie-Gay, M., Ryan, C. Burns, M. & Chaffey, C. (2004). Draft Vegetation maps of Coonabarabran, Tambar Springs, Mendooran, Coolah & Cobbora 1:100,000 map sheets. Unpublished maps and floristic group profile; Benson, J.S. (1999-2009) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Somerville, M. (2009) Hunter, Central & Lower North Coast Vegetation Classification & Mapping Project Volume 2: Vegetation Community Profiles, report prepared by HCCREMS/Hunter Councils Environment Division for Hunter-Central Rivers Catchment Management.