New South Wales Vegetation Classification and Assessment: Part 1 Plant communities of the NSW Western Plains

J.S. Benson, C.B. Allen*, C. Togher** and J. Lemmon****

*Science and Public Programs, Royal Botanic Gardens and Domain Trust, Sydney, NSW 2000, AUSTRALIA.
** GIS Section NSW Department of Environment & Conservation, PO Box 1967 Hurstville, NSW 2220;
***Environment & Development Department, Wollongong City Council, Locked Bag 8821, South Coast Mail Centre, NSW 2521.
Corresponding author email: john.benson@rbgsyd.nsw.gov.au

***Abstract*:** For the Western Plains of New South Wales, 213 plant communities are classified and described and their protected area and threat status assessed. The communities are listed on the NSW Vegetation Classification and Assessment database (NSWVCA). The full description of the communities is placed on an accompanying CD together with a read-only version of the NSWVCA database.

The NSW Western Plains is 45.5 million hectares in size and covers 57% of NSW. The vegetation descriptions are based on over 250 published and unpublished vegetation surveys and maps produced over the last 50 years (listed in a bibliography), rapid field checks and the expert knowledge on the vegetation. The 213 communities occur over eight Australian bioregions and eight NSW Catchment Management Authority areas. As of December 2005, 3.7% of the Western Plains was protected in 83 protected areas comprising 62 public conservation reserves and 21 secure property agreements. Only one of the eight bioregions has greater than 10% of its area represented in protected areas. 31 or 15% of the communities are not recorded from protected areas. 136 or 64% have less than 5% of their pre-European extent in protected areas. Only 52 or 24% of the communities have greater than 10% of their original extent protected, thus meeting international guidelines for representation in protected areas. 71 or 33% of the plant communities are threatened, that is, judged as being 'critically endangered', 'endangered' or 'vulnerable'.

While 80 communities are recorded as being of 'least concern' most of these are degraded by lack of regeneration of key species due to grazing pressure and loss of top soil and some may be reassessed as being threatened in the future. Threatening processes include vegetation clearing on higher nutrient soils in wetter regions, altered hydrological regimes due to draw-off of water from river systems and aquifers, high continuous grazing pressure by domestic stock, feral goats and rabbits, and in some places native herbivores — preventing regeneration of key plant species, exotic weed invasion along rivers and in fragmented vegetation, increased salinity, and over the long term, climate change.

To address these threats, more public reserves and secure property agreements are required, vegetation clearing should cease, re-vegetation is required to increase habitat corridors and improve the condition of native vegetation, environmental flows to regulated river systems are required to protect inland wetlands, over-grazing by domestic stock should be avoided and goat and rabbit numbers should be controlled and reduced. Conservation action should concentrate on protecting plant communities that are threatened or are poorly represented in protected areas.

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Introduction

This paper describes the plant communities recorded on the NSW Vegetation Classification and Assessment database (NSWVCA) for the NSW Western Plains and analyses their protected area and threat status. The vegetation classification, plant community database entries, assessment of protected area status, assessment of threat status and specifications of the database were compiled by J.S. Benson. The other authors assisted with technical aspects of the work.

The CD in the back pocket of this journal issue contains a read-only version of the NSWVCA database, appendices to the Introductory paper (Benson 2006, this volume) and this Part of the NSWVCA project. The full description of the 213 classified NSW Western Plains plant communities, with 90 information fields, runs to about 700 pages, rendering it too long to print in a journal. Therefore, it is presented in Folder 3 on the CD as Appendix A of this paper (NSWVCA Part 1) The communities are also presented in 19 broadly-defined vegetation Formation Groups. A shorter version of the NSW Western Plains plant community descriptions, containing 28 information fields, is in Appendix B in Folder 3 on the CD. Reports on 8 IBRA Bioregions and two Catchment Management Authorities areas are also provided in Folder 3 on the CD.

The Introductory paper (this volume) describes the vegetation classification, the threat and protected area status assessment and uses of the vegetation classification. The NSWVCA aims to assist with setting regional planning targets and with assessments at the site or property scale. While it is important to manage species populations, there is a world-wide trend towards landscape or 'ecosystem' management. One of the aims of the NSWVCA is to meet the goals of Convention on Biological Diversity (CBD) ecosystem approach to land use management and nature conservation (Shepherd 2004) to reduce biodiversity loss throughout the world by 2010.

The study area: the NSW Western Plains

The NSW Western Plains is 45 493 666 ha in size and covers 56.7% of NSW (Table 1, Figure 1). It is defined by the boundaries of the eight western-most IBRA Bioregions in NSW defined in Version 6 of Thackway & Cresswell (1995). Each classified plant community is recorded in a number of planning regions covering the NSW Western Plains including eight catchment management authority areas (CMAs) shown on Figure 1, the eight bioregions (Figure 4 in Benson 2006) and 41 sub-regions of these bioregions defined by NSW Department of Environment and Conservation (2004) (Figure 2) and Local Government Areas (LGAs).

The Western Plains contains four major climatic zones defined and mapped in Stern (2000): Arid Zone, Semi Arid (hot, persistently dry), Semi-Arid (warm, winter rainfall), Temperate (hot summers) and Dry Subtropical (moderately dry winter) (Figure 3 in Benson 2006). Rainfall varies from about 500 mm in the east in the wheatbelt to less than 200 mm in the far north-west corner of NSW.

The main landforms include sand dunes, sandplains, floodplains, alluvial plains, stagnant alluvial plains, peneplains, scarps, hills and rises. Most of the area is composed of unconsolidated aeolian or alluvial sediments with rocky outcrops occurring on hills and ranges. The Barrier Range near Broken Hill contains metamorphic and sedimentary rocks and the Cobar Peneplain is predominantly composed of sandstone, outwash sandsheets with small areas of granite. Silcrete outcrops occur on scarps on the Grey Range and in Sturt National Park in the far north-corner of NSW. Gypsum, limestone, and gravels occur over small areas. Soils vary from various types of clay and loam on floodplains and alluvial plains to loams and sands on sand dunes and sandplains. A variety of other soil types occur on rocky outcrops on hills and ranges. Features of the eight bioregions that comprise the NSW Western Plains are described in NSW National Parks and Wildlife Service (2003).

Table 1. Size of the eight IBRA Bioregions (Version 6) that define the NSW Western Plains.

IBRA Bioregion	Bioregion Area (ha)	% of NSW
Broken Hill Complex	3,762,674	4.7
Channel Country	2,337,383	2.9
Cobar Peneplain	7,369,692	9.2
Darling Riverine Plains	9,397,269	11.7
Mulga Lands	6,582,934	8.2
Murray Darling Depression	7,922,534	9.9
Riverina	7,023,267	8.8
Simpson Strzelecki Dunefields	1,097,913	1.4
Total for Western Plains	45,493,666	56.7

Previous botanical studies

Beadle (1945) produced the first map of the vegetation of the NSW Western Plains, one of the first vegetation maps published in Australia. This was followed by Moore (1953a, b) who mapped and described the vegetation of the South Western Slopes and eastern Riverina. Both Beadle's and Moore's maps were broad-scale but identified major vegetation patterns. Beadle's (1981) book *The Vegetation of Australia* describes the vegetation of western NSW in the context of a vegetation classification for Australia.

An early quantitative study of regional vegetation was conducted by Noy-Meir (1971). It contains an ordination, by principal component analysis, of 193 sites (of 383 sampled) covering part of south-western NSW, north-western Victoria and eastern South Australia to define 20 main floristic groups.

The Royal Botanic Gardens (Botanic Gardens Trust Sydney) initiated a program of mapping the vegetation of the Western Plains in the early1970s with a view to producing broad-scale vegetation maps of all of NSW. Pickard & Norris (1994) map the vegetation of the north western quarter of the state at a scale of 1:1 million. Fox (1991), Scott (1992), Porteners (1993) and Porteners et al. (1997) map and describe the vegetation of south-western NSW at 1:250 000 scale. Norris & Thomas (1991) document vegetation on rocky outcrops in south-western NSW. With the exception of Porteners et al. (1997) and Norris & Thomas (1991), these surveys were not supported by published quantitative plot data, though part of the Riverina Bioregion in south-western NSW mapped by Porteners (1993) was remapped at 1:100 000 scale with intensive plot sampling by Horner et al. (2002).

Other key vegetation descriptions include Milthorpe (1991) who describes the plant communities of the far north western corner of NSW; Westbrooke et al. (1998) who map the Scotia mallee in the far south-western NSW at 1:100 000 scale; Benson et al. (1997) who classify the native grasslands in the Riverina Bioregion; the NSW Soil Conservation Service (many authors) that mapped land systems in the western two-thirds of the Western Plains from the 1970s to the 1990s. The

land systems maps contain information on vegetation but are not vegetation maps *per se*. A major achievement was the publication of the book *Plants of Western New South Wales* by Cunningham et al. (1981) documenting the plant species in the Western Plains.

Wetlands have been variously surveyed and mapped:– Biddiscome (1963) mapped the Macquarie Marshes region in the northern NSW wheatbelt, there was more detailed mapping of the Macquarie Marshes by Paijmans (1981) and Johnson & Wilson (1990); Kingsford & Porter (1999) documented the wetlands of the Paroo River system; Margules & Partners (1990) and Smith & Smith (1990) mapped and surveyed the vegetation on the inner floodplain of the Murray River; Pressey et al. (1984) mapped and surveyed the Great Cumbung Swamp at the confluence of the Lachlan and Murrumbidgee Rivers; and McCosker (2000) mapped the Gingham watercourse on the Gwydir River.

The north-eastern part of the Western Plains, covering the NSW central and northern wheatbelt, have been surveyed and mapped by Sivertsen & Metcalfe (1995), Sivertsen & Metcalfe (2001) and Metcalfe et al. (2003). Parts of the wheatbelt are intensively sampled and mapped at 1:100 000 scale by Lewer et al. (2002) and Cannon et al. (2002). In the northern part of the wheatbelt, McGann & Earl (1999) sampled and described the grasslands of the Moree region. Peasley (2001) produced a detailed vegetation dominant canopy species type map of the Moree Plains Shire and the eastern section of the Walgett Shire (Peasley 2000). To the immediate west of the eastern Walgett Shire mapping, the Northern Floodplains Planning Committee (2004) used

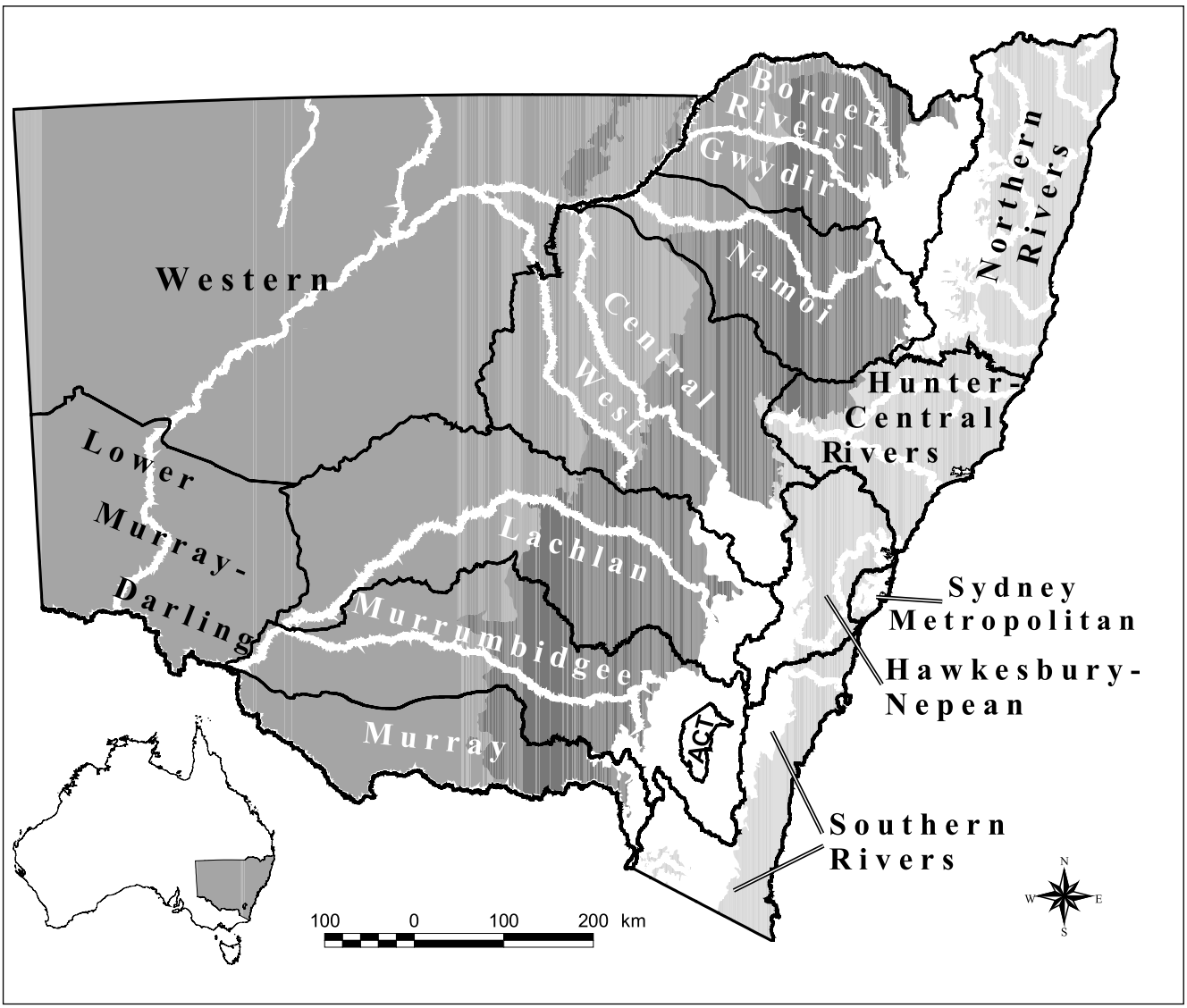

Fig. 1. The Western Plains section of New South Wales (mid-grey area on left) in relation to the boundaries of NSW Catchment Management Authority areas (named and defined by black lines) and major rivers (white lines). Other sections of NSW are: dark grey = Western Slopes; white = Tablelands; light grey = Coast and Eastern Escarpment. The Western Plains covers 57% of New South Wales.

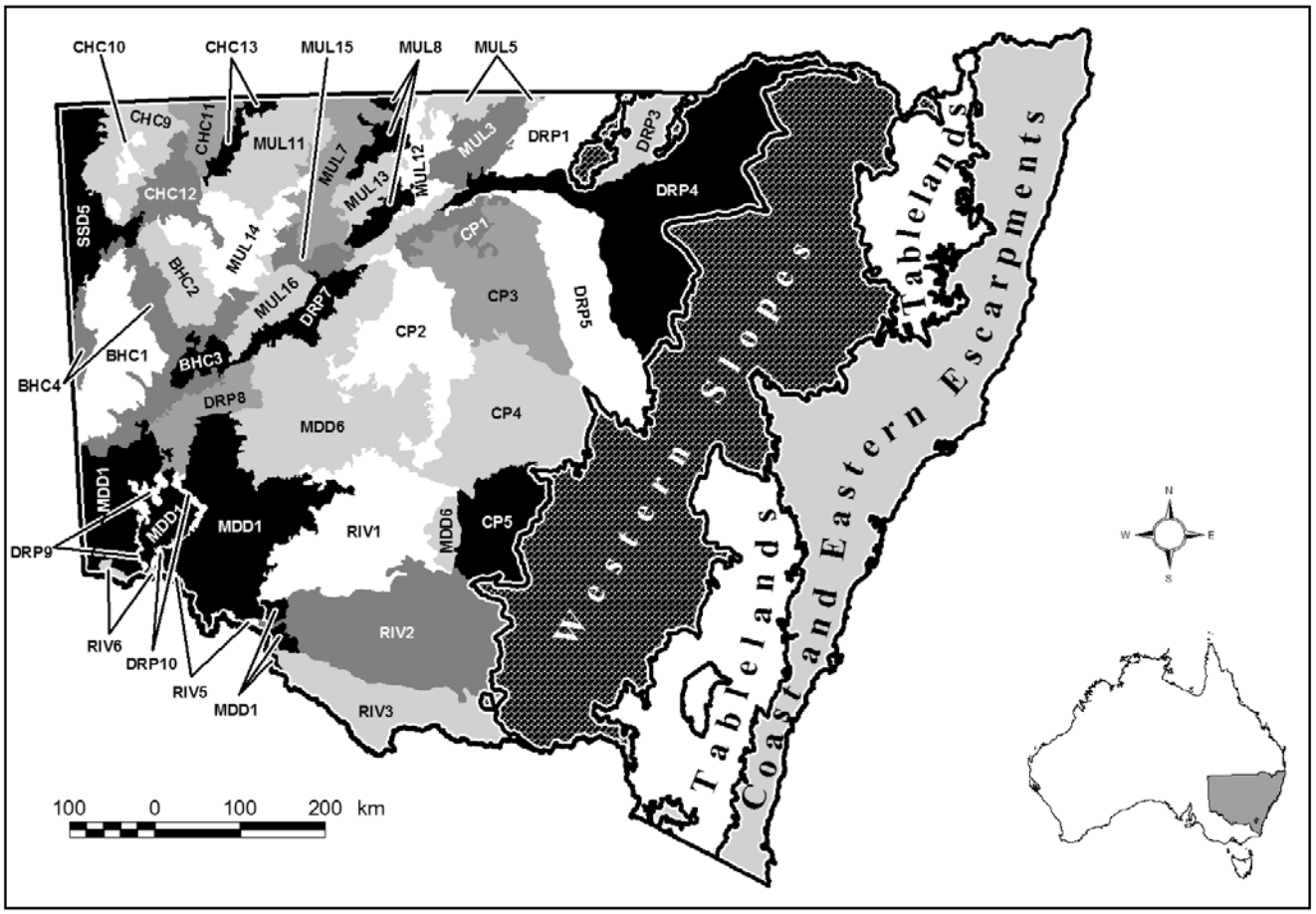

Fig. 2. IBRA Bioregions and sub-regions in the NSW Western Plains based on Version 6.0 of IBRA. Plant communities in the NSWVCA are recorded in these sub-regions.

BHC = Broken Hill Complex Bioregion with sub-regions BHC1 = Barrier Range, BHC2 = Mootwingee Downs, BHC3 = Scopes Range, BHC4 = Barrier Range Outwash, Fans and Plains; CHC = Channel Country Bioregion with sub-regions: CHC9 = Central Downs - Fringing Tablelands and Downs, CHC10 = Core Ranges, CHC11 = Bulloo Overflow, CHC12 = Central Depression, CHC13 = Bulloo Dunefields; CP = Cobar Peneplain Bioregion with sub-regions: CP1 = Boorindal Plains, CP2 = Barnato Downs, CP3 = Canbelego Downs, CP4 = Nymagee-Rankins Springs, CP5 = Lachlan Plains; DRP = Darling Riverine Plains Bioregion with sub-regions: DRP1 = Culgoa-Bokhara, DRP3 = Warrambool-Moonie, DRP4 = Castlereagh-Barwon, DRP5 = Bogan-Macquarie, DRP6 = Louth Plains, DRP7 = Wilcannia Plains, DRP8 = Menindee, DRP9 = Great Darling Anabranch, DRP10 = Pooncarie-Darling; MUL = Mulga Lands Bioregion with sub-regions: MUL3 = Nebine Plains, Block Range, MUL5 = Warrego Plains, MUL7 = Paroo Sand Sheets, Cuttaburra-Paroo, MUL8 = West Warrego - Tablelands and Downs MUL11 = Urisino Sandplains, MUL12 = Warrego Sands, MUL13 = Kerribree Basin, MUL14 = White Cliffs Plateau, MUL15 = Paroo Overflow, MUL16 = Paroo-Darling Sands; MDD = Murray Darling Depression Bioregion with sub-regions: MDD1 = South Olary Plains, Murray Basin Sands, MDD2 = Darling Depression; RIV = Riverina Bioregion with sub-regions: RIV1 = Lachlan, RIV2 = Murrumbidgee, RIV3 = Murray Fans, RIV5 = Robinvale Plains, RIV6 = Murray Scroll Belt; SSD = Simpson-Strzelecki Dunefields Bioregion with sub-region: SSD5 = Strzelecki Desert, Western Dunefields.

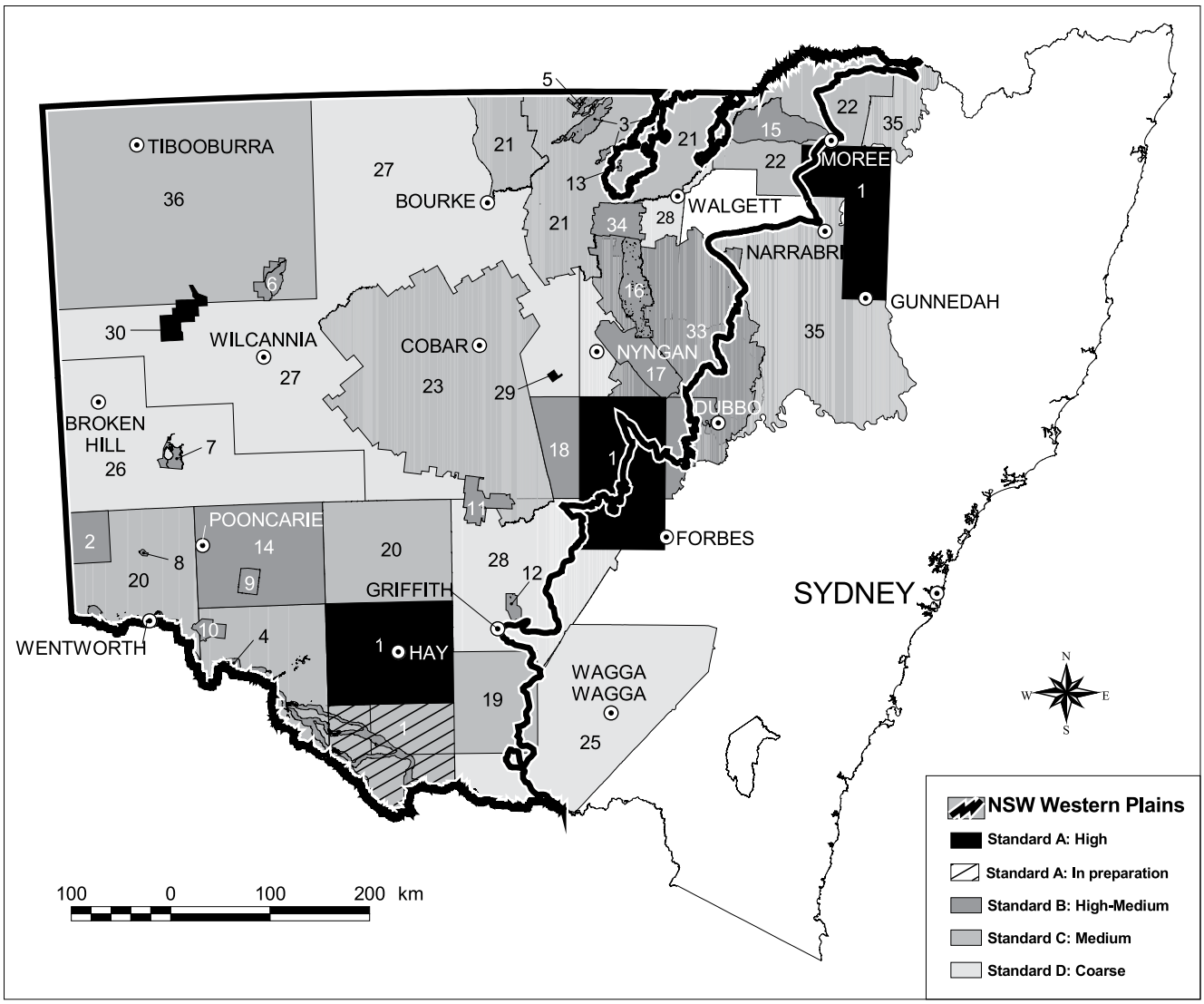

Fig. 3. Major vegetation maps covering the NSW Western Plains ranked into four levels of quality based on Benson (1995) depending on the level of supporting field data and the resolution of the vegetation mapping.

1 (DLWC, 2002) and (DIPNR in prep). 2 (Westbrooke et al. 1998); 3 (Dick 1993); 4 (Margules & Partners, 1990 and 2nd edition 1996); 5 (Hunter & Earl 2002); 6 (Westbrooke et al. 2003); 7 (Westbrooke et al. 2001); 8 (Westbrooke et al. 1997); 9 (Westbrooke et al. 1995); 10 (Morcom & Westbrooke 1990); 11 (Cohn 1995); 12 Whiting (1997); 13 (McGann et al. 2001); 14 (Porteners et al. 1997); 15 (McCosker 2000); 16 (Johnson & Wilson 1991); 17 (Steenbeeke 1996); 18 (Sivertsen & Metcalfe 2001 and Sivertsen & Metcalfe 1995); 19 (Roberts & Roberts 2001); 20 (Fox 1991, Scott 1992, Porteners 1993); 21 (NFPC 2004); 22 (Peasley 2001); 23 (Dykes 2002); 24 (Biddiscombe 1963); 25 (Moore 1953a); 26 (Kerr et al. 2000); 27 (Pickard & Norris 1994); 28 (Beadle 1945); 29 (Porteners 2003); 30 (Porteners 2003a); 33 (Kerr et al. 2003); 34 (Witts 1995); 35 (RACAC 2004); 36 (Milthorpe 1980). See Appendix C *NSW Western Plains bibliography.xls* in Folder 3 on the CD for details of these references.

satellite imagery and field checking to produce a series of 1:100 000 scale vegetation maps covering the Western Division section of Walgett Shire, Brewarrina Shire and north-eastern part of Bourke Shire. The Wombeira Land System that covers part of this region was previously mapped for its vegetation by Dick (1990). In central-west NSW, Dykes (2002) used satellite imagery and ground checking to map the vegetation of the Cobar Shire in the Cobar Peneplain Bioregion. In contrast with Dykes' qualitative approach, Austin et al. (2000) surveyed and modeled the vegetation of the central Lachlan River region in central-western NSW.

The vegetation abutting the NSW borders to the adjoining States of South Australia, Queensland and Victoria has been surveyed and mapped at various scales (see references in Appendix C, the bibliography in Folder 3 on the CD).

Vegetation surveys, maps and descriptions are also available for many of the conservation reserves in western NSW including: Mallee Cliffs, Mungo, Kinchega, Paroo-Darling and Gundabooka National Parks; Nombinnie, Round Hill, Yathong, Tawari, Ledknapper, Narran Lake, Nearie Lake, Quanda, Woggoon, Macquarie Marshes, Midkin and other Nature Reserves (see Appendix C, the bibliography in Folder 3 on the CD). Most of the vegetation classifications derived in reserve surveys and mapping projects are supported by sample data and data analysis and the vegetation maps are at a finer scale than regional mapping. The major reserves requiring botanical survey and detailed vegetation mapping as of December 2005 were Sturt National Park, Nocoleche Nature Reserve and Pindara Downs Aboriginal Area in the arid zone of far north-western NSW.

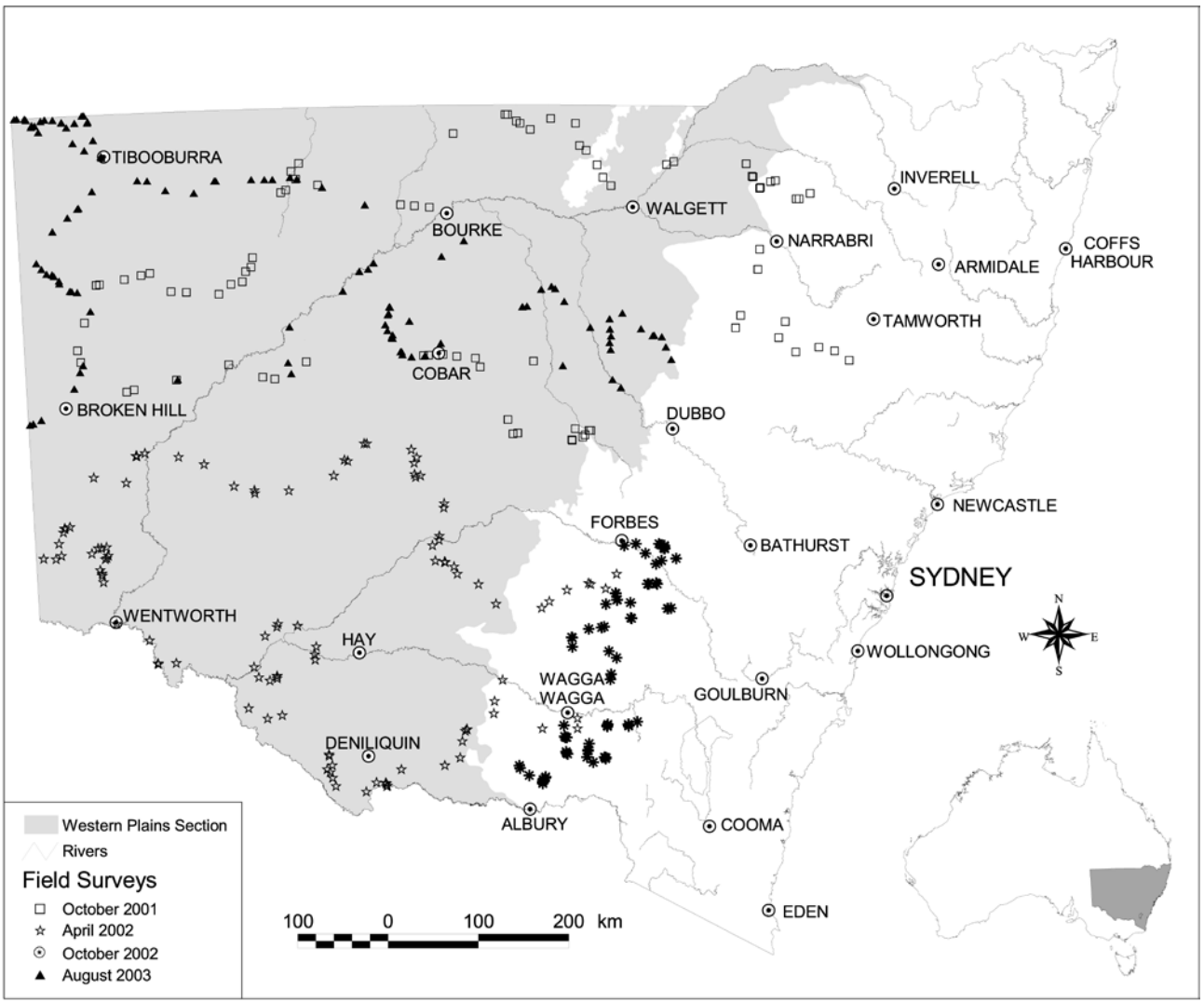

Fig. 4. Locations in western NSW checked for their vegetation and landscape features and photographed during field traverses.

Most vegetation mapping in the Western Plains has been of current vegetation, however Fox (1991) and Pickard & Norris (1994) mapped pre-European vegetation. Broadly classified, pre-European modeled vegetation maps have been produced for the Moree Plains Shire (White 2002a) and for the western section of the Riverina Bioregion (White 2002b).

Considering the 1:1.5 million scale State Vegetation Map in Keith (2004), 32 of the 99 broadly defined and mapped Vegetation Classes are located in the NSW Western Plains.

Key vegetation maps completed in the western two thirds of NSW are shown on Figure 3 and graded by the mapping standards set out in Benson (1995). Different standards have been used to map and survey the vegetation, ranging from coarse scale mapping based on aerial photos or satellite imagery with minimum descriptions of the vegetation, to detailed stratified plot sampling with precise mapping and detailed vegetation descriptions. The latter standard has covered only small parts of the Western Plains.

A number of studies of plant species dynamics have been produced on plant species that occur in Australia's semi-arid or arid rangelands. These include Preece (1971a, 1971b) on *Acacia aneura* (Mulga), Noble & Whalley (1978) on the genus *Nitraria* and Eldridge et al. (1990) on several Chenopodiaceae species. The fire ecology of most plant species in Western NSW is poorly understood with the exception of some mallee species (Noble 1989, Bradstock 1990), lichen crusts (Eldridge & Bradstock 1994) and some species of *Acacia* (Hogkinson & Oxley 1990, Hogkinson

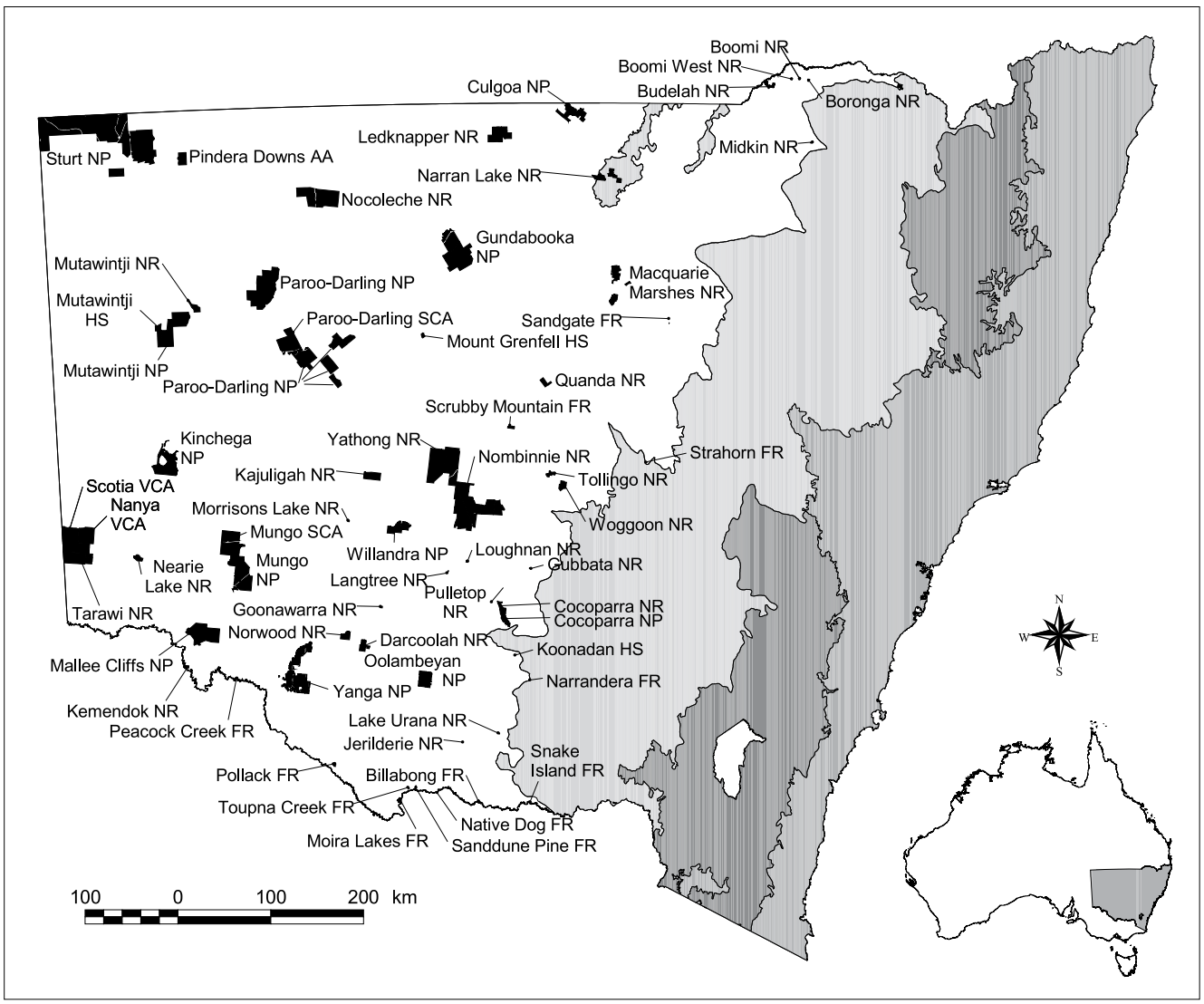

Fig. 5. Public conservation reserves in the NSW Western Plains, December 2005. This also shows the Nanya and Scotia properties that were purchased through the National Reserves System to be protected as conservation agreements. 19 small, secure property agreements are not shown. Generated from the NSW Department of Environment and Conservation Reserves GIS layer, December 2005, DEC Acquired Lands GIS layer, November 2005 and NSW State Forests Flora Reserves GIS layer, October 2003.

2002). Broad guidelines on fire regimes in major vegetation types in NSW are outlined in Kenny et al. (2003).

A spreadsheet list of over 250 vegetation surveys, vegetation mapping and related documents is presented in Appendix C, Part 2 titled *NSW Western Plains Bibliography.xls* in Folder 3 on the CD.

Degradation of the native vegetation

Beadle (1948) presents a comprehensive analysis of the impacts of 100 years of land use up to that time. He documents wind, gully and sheet soil erosion; overstocking; timber removal; drought; and problems with establishing perennial plants from seed. He discusses the loss of chenopod shrub cover due to high domestic stock rates, and the loss of Mulga (*Acacia aneura*) shrubs due to over-cutting for fodder. This reduction in biomass and ground cover led to frequent dust storms and soil erosion over large sections of the Western Plains but since the 1960s, stocking rates have declined and erosion control measures have reduced soil erosion. However, current grazing regimes are still leading to degradation of native vegetation and lack of regeneration of palatable species (Pickard & Norris 1994).

Denny (1992) compared present-day vegetation structure to that described by early explorers — Sturt in 1833, Mitchell in 1848 — at sites across western NSW. The comparisons reveal there has been a significant loss of vegetation biomass in most types of native vegetation, particularly in the ground and mid-layers of the vegetation. Denny points to a consistent pattern of loss of saltbush (*Atriplex*) shrubs in regions where they were once abundant.

In contrast to Denny's findings, there are some regions in the Western Plains where there has been an increase in shrub growth since the middle of the 20th Century. This is colloquially referred to as 'woody regrowth'. Explanations include a loss of topsoil due to 150 years of grazing, selective grazing of herbaceous species, altered fire regimes, pulses of growth during decades of high rainfall or increased atmospheric carbon dioxide levels (Pickard & Norris 1994, Oliver et al. 2001). Regrowth particularly affects the south-eastern section of the Cobar Peneplain Bioregion west of Nyngan, although other parts of inland NSW are also affected. Most of the shrubby regrowth is of non-palatable shrub species in the genera *Senna*, *Eremophila* and *Dodonaea*. White Cypress Pine (*Callitris glaucophylla*) also forms dense regrowth stands on the Cobar Peneplain but this species has threatened status in the Riverina Bioregion to the south, where its recruitment is poor due the grazing of seedlings by stock and rabbits (Porteners 1993, J. Benson pers. obs.).

Recent and current land clearing in the NSW Western Plains is concentrated in the northern wheatbelt in an arc from Moree in the east to Brewarrana in the west and Nyngan in the central west. Areas are also being cleared in the Western Division for grazing or opportunistic cropping. Bedward et al. (2001) reports on clearing of mapped woody vegetation types from 1985 to 2000 in the northern wheatbelt from Dubbo to the Queensland border. They reveal a significant decline in woody native vegetation. For example, in 1985, about 27% of the Moree region was covered with native woody vegetation but 17% of this was cleared by 2000 representing a clearing rate of 1.1% per year. If this rate is extrapolated into the future it implies that most native vegetation would be removed on private land in the NSW wheatbelt within seven decades unless clearing is checked.

River regulation for irrigation crops is increasingly impacting on floodplain vegetation including riparian forests and woodlands and sedge or herbaceous wetlands. The Paroo River in far north western NSW is the only major western NSW river that is not regulated.

The vegetation classification

Vegetation classification involved the collation and comparison of over 250 surveys, mapping or other documentation on the native vegetation of the Western Plains (Appendix C, the bibliography in Folder 3 on the CD). Key vegetation survey and mapping projects formed the starting point of the classification. However, most vegetation mapping is very coarse, particularly in the north-western quarter of NSW, where the main map source is Pickard & Norris (1994). Other references, expert advice, the author's knowledge and extensive field checking expanded the classification. Most broad map units were split into a number of plant communities. Plant species records in plot data were used to list characteristic species for some communities. However, as of 2006, floristic plot data were absent from most of the Western Plains, exceptions being some conservation reserves and the northern wheatbelt. Therefore, qualitative descriptions of vegetation were relied on for defining and describing many plant communities. For example, the classification includes most of the plant communities described by Milthorpe (1972, 1991) for the far north-west corner of NSW but most of these are not mapped in Pickard & Norris (1994) due to the scale of that mapping. Interstate vegetation surveys and maps assisted with cross-border comparisons of vegetation and for classifying the vegetation near to the borders of South Australian, Victoria and Queensland.

The classification was checked in the field through four field traverses totaling over 14 000 km between 2000 and 2004. The traverses sampled the major vegetation maps in western NSW and major environmental gradients across that section of the State from north to south and east to west. Over 400 field stops were made (Figure 4). At each stop, dominant plant species were recorded or collected for identification, photographs were taken, a GPS reading was recorded and physiographic features including soil and geological type were noted. Due to the size of the study area, the intent of the field checking was not to sample the vegetation for

quantitative analysis. The field surveys checked existing vegetation mapping, vegetation descriptions and helped to populate the characteristic species fields in the database for plant communities that lacked species data or descriptions in the literature. It also assisted in correlating vegetation types with landscape features and provided an opportunity to photograph the vegetation. Field checking of poorly mapped areas such as Sturt National Park and the NSW — South Australian border realized a number of plant communities not described in the literature. These have been incorporated into the database with a medium or low confidence level due to lack of ground data.

The vegetation of most NSW Western Plains conservation reserves has been mapped or documented in reports. Most of this reserve information was checked in the field. While the location of conservation reserves is often biased toward rugged terrain or low nutrient soils (Pressey et al. 2000), vegetation descriptions of western reserves sample landscapes that extend beyond reserve boundaries. Therefore, mapping and descriptions of vegetation in reserves, such as by Westbrooke et al. (1995, 2003, 2004), helped to define a number of plant communities in the classification as well as assisting in estimating the extent of plant communities in protected areas, and assessing the overall threat status of the communities.

The extent of each plant community in protected areas was determined through GIS or manual overlays of vegetation maps, from descriptions in reports, field checks and expert advice (see Benson 2006 for details). Statistics on the area of plant communities in protected areas, compared to pre-European and current extent estimates, are calculated in the NSWVCA database. These guide the allocation of plant communities into one of the 15 protected area adequacy categories described in Benson (2006). The rarer the former extent of a plant community (Table 2) the larger the proportion required to be sampled in protected areas in order for it to be considered adequately protected.

Threat criteria (Appendix B of Benson 2006) were used to assign a threat category to each classified plant community. The plant community threat categories mirror the World Conservation Union (IUCN) codes for species and are: 'critically endangered' (CE), 'endangered' (E), 'vulnerable' (V), 'near threatened' (NT) and 'least concern' (LC).

Table 2: Number of plant communities that are estimated to have been Originally Common >10 000 ha, Originally Restricted 1000–10 000 ha and Originally Rare <1000 ha before European settlement.

Estimated pre-European Extent	**Community ID Numbers**	**Number of plant communities**
RARE (<1,000 ha)	19, 65, 66, 86, 140, 151, 188, 190, 196, 220, 226, 239, 240, 261	**14**
Restricted (1,000 - <2,000 ha)	22, 121, 169, 183, 224, 229, 236, 250	8
Restricted (2,000 - <5,000 ha)	21, 122, 133, 138, 162, 200, 213, 231, 235, 253, 271	11
Restricted (5,000 - <10,000 ha)	20, 48, 63, 115, 132, 136, 191, 205, 208, 210, 211, 216, 225, 227, 228, 230, 242, 249, 254, 262	20
TOTAL RESTRICTED (1,000 - <10,000 ha)		**39**
Common (10,000 - <20,000 ha)	5, 23, 64, 68, 142, 146, 163, 197, 234, 237, 241, 256, 263	13
Common (20,000 - <50,000 ha)	2, 8, 9, 12, 29, 41, 54, 71, 74, 77, 83, 110, 127, 129, 130, 137, 139, 149, 150, 152, 165, 166, 180, 181, 182, 189, 193, 198, 199, 214, 215, 218, 221, 232, 233, 243, 251, 252, 257, 264	40
Common (50,000 - <100,000 ha)	10, 11, 38, 47, 50, 60, 62, 117, 131, 160, 161, 164, 168, 174, 175, 176, 194, 204, 206, 212, 217, 222, 248, 258	24
Common (100,000 - <200,000 ha)	7, 31, 35, 53, 75, 100, 106, 143, 145, 167, 184, 185, 186, 192, 201, 245, 246	17
Common (200,000 - <500,000 ha)	13, 16, 17, 18, 28, 36, 39, 43, 44, 45, 46, 49, 55, 56, 57, 67, 69, 70, 72, 82, 88, 108, 144, 155, 158, 172, 195, 207, 247	29
Common (≥500,000 ha)	15, 24, 25, 26, 27, 37, 40, 52, 58, 59, 61, 76, 80, 87, 98, 103, 104, 105, 109, 118, 119, 120, 123, 124, 125, 128, 134, 153, 154, 156, 157, 159, 170, 171, 173, 238, 244	37
TOTAL COMMON (≥10,000 ha)		**160**

Table 3. List of 213 plant communities in the NSW Western Plains by alphabetical order of formation group acronym showing their ID number; protected area/threat code; common name; pre-European, current and protected areas and ranges based on accuracy estimates; proportion in bioregions; proportion in Catchment Management Authority areas (CMAs); and extent in protected areas with an accuracy code.

Notes: The formation group acronyms are correlated to formation group names in Table 4. The Protected Area/Threat code and the protected area extent accuracy codes M, E1-E4 are explained in Benson (2006). Appendix A, in Folder 3 on the CD, lists full records (90 information fields) of all plant communities in the NSW Western Plains. Appendix B, in Folder 3 on the CD, contains the "All Records Short Report" (28 information fields) of all Western Plain communities. *indicates communities that extend eastwards into the Western Slopes Section of NSW.

Formation Group Acronym	Veg ID: Threat/Protected Area Code Plant Community Common Name	ESTIMATED EXTENT: pre-European (range) Current Range (% pre-European) Protected Range (% pre-European)	% of Community in Bioregion	% of Community in CMA	Protected Area Name and Size (ha) (* = also on Western Slopes)		Veg Area (ha) % of Pre-European & Accuracy Code		
ASI	023: E/5b Yarran shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	12,000 (6,000 - 18,000) ha 2,500 - 7,500 ha (14 - 130 %) 230 - 660 ha (1.3 - 11 %)	<30% CP 30-70% MDD <30% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Kajuligah NR Mungo NP Willandra NP Yanga NP	13,826 111,842 18,835 70,581	10 60 5 370	0.08 0.5 0.04 3.08	E3 E3 E3 E2
ASI	026: CE/5a Weeping Myall open woodland of the Riverina and NSW South Western Slopes Bioregions	1,600,000 (1,200,000 - 2,000,000) ha 120,000 - 200,000 ha (6 - 17 %) 740 - 890 ha (0.037 - 0.074 %)	<30% CP 30-70% NSS 30-70% RIV	<30% Central West <30% Lachlan 30-70% Murrumbidgee	Lake Urana NR Oolambeyan NP DE9905 PA	302 21,839 663	10 715 88	0 0.04 0.01	E3 M M
ASI	027: E/5a Weeping Myall open woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions	1,000,000 (700,000 - 1,300,000) ha 70,000 - 130,000 ha (5.4 - 19 %) 110 - 190 ha (0.0085 - 0.027 %)	30-70% BBS 30-70% DRP <30% NAN	<30% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Careunga NR* Culgoa NP Kirramingly NR* Macquarie Marshes NR	492 24,965 1,329 19,465	9 100 5 37	0 0.01 0 0	M E3 E1 M
ASI	029: NT/5a Brigalow open woodland on red earth and clay plains mainly in the Mulga Lands Bioregion	45,000 (41,000 - 49,000) ha 27,000 - 33,000 ha (55 - 80 %) 8 - 22 ha (0.015 - 0.054 %)	<30% CP >70% MUL	<30% Lachlan >70% Western	Ledknapper NR Yathong NR	30,759 108,768	10 5	0.02 0.01	E3 E3
ASI	031: NT/5a Brigalow-Gidgee open woodland on clay plains west of the Culgoa River, Mulga Lands Bioregion	100,000 (70,000 - 130,000) ha 38,000 - 70,000 ha (29 - 100 %) 250 - 750 ha (0.19 - 1.1 %)	>70% MUL	>70% Western	Culgoa NP	24,965	500	0.5	E3
ASI	035: CE/5a Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion.	150,000 (110,000 - 190,000) ha 9,800 - 18,000 ha (5.2 - 16 %) 370 - 440 ha (0.19 - 0.4 %)	30-70% BBS <30% DRP <30% NSS	30-70% Border R/Gwydir <30% Central West 30-70% Namoi <30% Western	Brigalow Park NR* VCA041 VCA*	453 33	370 33	0.25 0.02	E2 E1
ASI	077: E/4a Yarran shrubland on peneplains and alluvial plains of central-northern NSW	40,000 (20,000 - 60,000) ha 5,000 - 15,000 ha (8.3 - 75 %) 390 - 700 ha (0.65 - 3.5 %)	<30% BBS 30-70% CP <30% DRP <30% NSS	<30% Central West 30-70% Lachlan <30% Murray <30% Murrumbidgee	Cocoparra NP Cocoparra NR Yathong NR	8,364 4,775 108,768	1 42 500	0 0.11 1.25	M M E2

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ASI	118: NT/5a Gidgee chenopod woodland on red-brown clays in the semi-arid (hot) climate zone mainly in the Mulga Lands Bioregion.	500,000 (350,000 - 650,000) ha 210,000 - 390,000 ha (32 - 110 %) 2,400 - 4,300 ha (0.37 - 1.2 %)	<30% DRP 30-70% MUL	<30% Central West >70% Western	Culgoa NP Narran Lake NR* Nocoleche NR Paroo-Darling NP	24,965 21,830 71,068 176,427	700 5 2,600 25	0.14 0 0.52 0.01	E3 E2 E3 E1
ASI	119: NT/4a Sandplain Mulga tall open shrubland of the semi-arid and arid climate zones	2,200,000 (1,600,000 - 2,800,000) ha 840,000 - 1,500,000 ha (30 - 94 %) 25,000 - 46,000 ha (0.89 - 2.9 %)	<30% BHC <30% CHC <30% CP <30% DRP <30% MUL <30% MDD <30% SSD	<30% Lower MD >70% Western	Kinchega NP Ledknapper NR Mallee Cliffs NP Mungo NP Narran Lake NR* Nocoleche NR Pindera Downs AA Sturt NP Tarawi NR Scotia AWC VCA	44,441 30,759 57,956 111,842 21,830 71,068 11,790 338,232 33,445 64,528	10 580 10 20 30 14,000 100 20,600 2 50	0 0.03 0 0 0 0.64 0 0.94 0 0	E1 M E2 E2 M E3 E3 E2 E2 E3
ASI	120: NT/4a Mulga on stony rises in the arid and semi-arid climate zones, particularly the Mulga Lands Bioregion	1,000,000 (500,000 - 1,500,000) ha 300,000 - 900,000 ha (20 - 180 %) 24,000 - 44,000 ha (1.6 - 8.8 %)	<30% BHC 30-70% MUL <30% SSD	>70% Western	Nocoleche NR Paroo-Darling NP	71,068 176,427	3,600 30,360	0.36 3.04	E3 E2
ASI	121: LC/1b Umbrella Mulga - Beefwood open shrubland on Peery Hills, Mulga Lands Bioregion	1,000 (500 - 1,500) ha 500 - 1,500 ha (33 - 300 %) 700 - 1,300 ha (47 - 260 %)	>70% MUL	>70% Western	Paroo-Darling NP	176,427	1,000	100	E3
ASI	123: NT/4a Mulga - Dead Finish on stony hills mainly of the Channel Country and Broken Hill Complex Bioregions	600,000 (420,000 - 780,000) ha 350,000 - 650,000 ha (45 - 150 %) 19,000 - 34,000 ha (2.4 - 8.1 %)	30-70% BHC <30% CHC <30% CP <30% MUL	<30% Lower MD 30-70% Western	Mutawintji HS Mutawintji NP Paroo-Darling NP Sturt NP	597 67,581 176,427 338,232	440 12,370 7,400 6,000	0.07 2.06 1.23 1	E1 E2 E1 E3
ASI	124: LC/2a Sandhill Wattle tall open shrubland on sand ridges in the arid zone	600,000 (300,000 - 900,000) ha 250,000 - 750,000 ha (28 - 250 %) 65,000 - 110,000 ha (7.2 - 37 %)	<30% BHC <30% CHC <30% DRP 30-70% SSD	<30% Lower MD >70% Western	Kinchega NP Sturt NP	44,441 338,232	153 91,500	0.03 15.25	M E2
ASI	125: NT/5a Mulga - Ironwood shrubland on loams and clays mainly of the Cobar Peneplain Bioregion	800,000 (560,000 - 1,000,000) ha 420,000 - 780,000 ha (42 - 140 %) 4,500 - 8,300 ha (0.45 - 1.5 %)	>70% CP <30% MDD	<30% Central West >70% Western	Gundabooka NP Kajuligah NR Yathong NR	64,282 13,826 108,768	5,000 100 1,300	0.63 0.01 0.16	E2 E3 E2
ASI	127: LC/1a Bastard Mulga - Mulga tall open shrubland of the semi-arid (hot) and arid climate zones	25,000 (18,000 - 32,000) ha 14,000 - 26,000 ha (44 - 140 %) 13,000 - 23,000 ha (41 - 130 %)	30-70% BHC 30-70% CHC <30% MUL	>70% Western	Mutawintji NP Mutawintji NR	67,581 6,711	14,300 3,400	57.2 13.6	E2 E1

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ASI	128: E/4a Nelia tall open shrubland of semi-arid sandplains	500,000 (350,000 - 650,000) ha 140,000 - 260,000 ha (22 - 74 %) 14,000 - 25,000 ha (2.2 - 7.1 %)	<30% BHC <30% DRP 30-70% MDD	30-70% Lower MD 30-70% Western	Kinchega NP Mungo NP Mutawintji NP Paroo-Darling NP Scotia AWC VCA	44,441 111,842 67,581 176,427 64,528	50 500 130 18,750 80	0.01 0.1 0.03 3.75 0.02	E2 E3 E3 E2 E3
ASI	129: NT/4a Cabbage-tree Wattle shrubland of the inland plains and drainage lines	35,000 (25,000 - 45,000) ha 22,000 - 40,000 ha (49 - 160 %) 250 - 750 ha (0.56 - 3 %)	<30% BHC 30-70% MUL	>70% Western	Sturt NP	338,232	500	1.43	E3
ASI	130: NT/4a Horse Mulga - Umbrella Mulga shrubland on ranges in the arid and semi-arid climate zones	30,000 (21,000 - 39,000) ha 18,000 - 32,000 ha (46 - 150 %) 460 - 840 ha (1.2 - 4 %)	<30% BHC 30-70% CP <30% DRP <30% MDD	>70% Western	Mutawintji NP Mutawintji NR Sturt NP	67,581 6,711 338,232	100 50 500	0.33 0.17 1.67	E3 E3 E3
ASI	131: LC/1a Gidgee of the intermittent watercourses or the arid zone (mainly Channel Country and SSD Bioreions)	80,000 (40,000 - 120,000) ha 33,000 - 97,000 ha (28 - 240 %) 13,000 - 39,000 ha (11 - 98 %)	>70% CHC <30% SSD	>70% Western	Sturt NP	338,232	26,000	32.5	E3
ASI	132: LC/1b Mulga - Rock Fuchsia-bush sparse shrubland of silcrete scarps and mesas of the Channel Country Bioregion	5,000 (2,500 - 7,500) ha 2,500 - 7,500 ha (33 - 300 %) 1,500 - 4,500 ha (20 - 180 %)	30-70% CHC	>70% Western	Sturt NP	338,232	3,000	60	E3
ASI	134: LC/3a Ironwood woodland of the semi-arid plains	600,000 (420,000 - 780,000) ha 350,000 - 650,000 ha (45 - 150 %) 18,000 - 51,000 ha (2.3 - 12 %)	<30% CP <30% DRP 30-70% MUL <30% MDD	<30% Central West <30% Lachlan 30-70% Western	Gundabooka NP Nocoleche NR Paroo-Darling NP Yathong NR	64,282 71,068 176,427 108,768	28,000 2,000 4,200 170	4.67 0.33 0.7 0.03	E2 E4 E2 E2
ASI	136: LC/5b Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	5,000 (2,500 - 7,500) ha 2,000 - 6,000 ha (27 - 240 %) 0 - 0 ha (0 - 0 %)	>70% BHC	>70% Western	Not Protected				
ASI	139: V/3a Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid regions	30,000 (15,000 - 45,000) ha 11,000 - 19,000 ha (24 - 130 %) 2,900 - 5,300 ha (6.4 - 35 %)	<30% CP <30% DRP <30% MUL >70% MDD <30% RIV	>70% Lower MD <30% Murrumbidgee <30% Western	Kinchega NP Nocoleche NR Paroo-Darling NP Yanga NP	44,441 71,068 176,427 70,581	1,510 1,000 1,500 100	5.03 3.33 5 0.33	M E4 E1 E3
ASI	199: NT/3a Hooked Needlewood - Needlewood - Mulga - Turpentine Bush open shrubland of the semi-arid and arid plains	20,000 (10,000 - 30,000) ha 7,500 - 22,000 ha (25 - 220 %) 1,400 - 4,100 ha (4.7 - 41 %)	<30% CHC <30% DRP 30-70% MUL 30-70% MDD	<30% Lower MD >70% Western	Gundabooka NP Mungo NP Nocoleche NR Paroo-Darling NP	64,282 111,842 71,068 176,427	200 50 1,000 1,500	1 0.25 5 7.5	E3 E3 E3 E2

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ASI	220: CE/5c Purple Wood wattle shrubland of the arid zone sandplains	500 (250 - 750) ha 130 - 370 ha (17 - 150 %) 35 - 65 ha (4.7 - 26 %)	<30% BHC <30% DRP 30-70% MDD	30-70% Lower MD 30-70% Western	Kinchega NP	44,441	50	10	E1
CCI	020: CE/5b Buloke - Moonbah - Black Box open woodland on sandy rises of semi arid (warm) climate zone	8,000 (4,000 - 12,000) ha 500 - 1,500 ha (4.2 - 38 %) 3 - 9 ha (0.025 - 0.23 %)	>70% RIV	<30% Lower MD >70% Murray	Lake Urana NR Wiesners Swamp NR*	302 102	5 1	0.06 0.01	E2 E2
CCI	022: E/5b Semi-arid shrubby Buloke - Slender Cypress Pine woodland	1,000 (500 - 1,500) ha 150 - 450 ha (10 - 90 %) 0 - 0 ha (0 - 0 %)	>70% MDD	>70% Lower MD <30% Murray <30% Murrumbidgee	Not Protected				
CCI	054: E/4a Buloke - White Cypress Pine woodland mainly in the NSW SW Slopes Bioregion	20,000 (10,000 - 30,000) ha 2,000 - 6,000 ha (6.7 - 60 %) 430 - 790 ha (1.4 - 7.9 %)	<30% DRP >70% NSS	<30% Central West 30-70% Lachlan	Goobang NP* GE9902 PA* GE9903 PA*	42,352 8 4	600 8 4	3 0.04 0.02	M E2 E2
CCI	055: E/5a Belah woodland on alluvial plains in central-north NSW	450,000 (320,000 - 580,000) ha 49,000 - 91,000 ha (8.4 - 28 %) 370 - 680 ha (0.064 - 0.21 %)	<30% BBS <30% CP 30-70% DRP	<30% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Boronga NR Budelah NR Careunga NR* Kirramingly NR* Macquarie Marshes NR Wilbertroy FR* VCA008 VCA*	198 4,049 492 1,329 19,465 136 400	20 1 440 5 30 6 25	0 0 0.1 0 0.01 0 0.01	E1 M E1 E2 M M M
CCI	057: NT/3a Belah/Black Oak - Western Rosewood - Wilga woodland of central NSW including Cobar Peneplain Bioregion	350,000 (250,000 - 450,000) ha 140,000 - 260,000 ha (31 - 100 %) 14,000 - 25,000 ha (3.1 - 10 %)	30-70% CP 30-70% MDD	<30% Central West >70% Lachlan <30% Murrumbidgee	Kajuligah NR Langtree NR Mount Grenfell HS Nombinnie NR Nombinnie SCA Oolambeyan NP Round Hill NR Scrubby Mountain FR Yathong NR	13,826 232 1,365 72,128 53,261 21,839 13,642 1,704 108,768	6,000 200 380 3,900 1,000 1 251 500 7,200	1.71 0.06 0.11 1.11 0.29 0 0.07 0.14 2.06	E3 M E3 E1 E2 M M E3 E2
CCI	058: NT/4a Black Oak - Western Rosewood open woodland on deep sandy loams of Murray-Darling Depression and Riverina Bioregions	1,000,000 (500,000 - 1,500,000) ha 250,000 - 750,000 ha (17 - 150 %) 32,000 - 58,000 ha (2.1 - 12 %)	<30% CP 30-70% MDD <30% RIV	<30% Lachlan >70% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Mallee Cliffs NP Morrisons Lake NR Mungo NP Tarawi NR Willandra NP Nanya Ballarat Uni VCA Scotia AWC VCA	57,956 319 111,842 33,445 18,835 28,849 64,528	16,000 17 10,000 6,000 600 3,120 9,000	1.6 0 1 0.6 0.06 0.31 0.9	E2 E3 E2 E1 E3 E2 E2

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CCI	059: NT/3a Belah/Black Oak - Western Rosewood - Leopardwood low open woodland on sandplain and sandy flats in semi arid (hot) and arid climate zones	800,000 (560,000 - 1,000,000) ha 390,000 - 710,000 ha (39 - 130 %) 41,000 - 75,000 ha (4.1 - 13 %)	<30% BHC 30-70% CP <30% DRP 30-70% MUL	>70% Western	Gundabooka NP Ledknapper NR Nocoleche NR Paroo-Darling NP Paroo-Darling SCA	64,282 30,759 71,068 176,427 41,457	500 950 10,000 22,000 25,000	0.06 0.12 1.25 2.75 3.13	E3 E1 E3 E2 E2
CCI	060: NT/3a Black Oak - Western Rosewood - bluebush/saltbush low sparse woodland on gravelly downs in the arid climate zone	50,000 (25,000 - 75,000) ha 15,000 - 45,000 ha (20 - 180 %) 2,600 - 4,600 ha (3.5 - 18 %)	30-70% BHC 30-70% MUL	>70% Western	Mutawintji NP Mutawintji NR	67,581 6,711	3,300 300	6.6 0.6	E1 E1
CCI	221: NT/5a Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	20,000 (10,000 - 30,000) ha 6,000 - 18,000 ha (20 - 180 %) 0 - 0 ha (0 - 0 %)	<30% BHC >70% MDD	>70% Lower MD	Not Protected				
CCI	228: NT/5b Semi-mesic woodland on basalt hills of the dry subtropical climate zone, north western slopes of NSW	6,000 (3,000 - 9,000) ha 1,300 - 3,700 ha (14 - 120 %) 0 - 0 ha (0 - 0 %)	30-70% BBS <30% DRP	30-70% Border R/Gwydir <30% Central West	Not Protected				
CCI	254: LC/5b Black Oak - Bladder Saltbush on light clays in the arid zone	5,000 (2,500 - 7,500) ha 2,300 - 6,700 ha (31 - 270 %) 0 - 0 ha (0 - 0 %)	>70% MDD	>70% Lower MD	Not Protected				
CHS	152: NT/3a Lunette chenopod shrubland mainly of the Murray-Darling Depression Bioregion	22,000 (11,000 - 33,000) ha 8,000 - 24,000 ha (24 - 220 %) 1,700 - 4,900 ha (5.2 - 45 %)	<30% DRP 30-70% MDD <30% RIV	>70% Lower MD <30% Western	Mungo NP VCA105 VCA	111,842 38	3,300 8	15 0.04	E2 E1
CHS	153: NT/4a Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones	1,500,000 (1,100,000 - 1,900,000) ha 630,000 - 1,100,000 ha (33 - 100 %) 48,000 - 58,000 ha (2.5 - 5.3 %)	<30% BHC <30% CHC <30% CP <30% DRP <30% MUL <30% MDD 30-70% RIV	<30% Central West <30% Lachlan 30-70% Lower MD <30% Murrumbidgee <30% Western	Kalyarr NP Kinchega NP Mallee Cliffs NP Morrisons Lake NR Mungo NP Nearie Lake NR Nocoleche NR Paroo-Darling NP Paroo-Darling SCA Willandra NP Yanga NP Yathong NR	14,936 44,441 57,956 319 111,842 4,354 71,068 176,427 41,457 18,835 70,581 108,768	2,920 10,800 800 10 18,000 1,170 500 10,000 3,500 100 5,220 10	0.19 0.72 0.05 0 1.2 0.08 0.03 0.67 0.23 0.01 0.35 0	E1 E1 E2 E2 E2 M E4 E4 E3 E4 E2 E2

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CHS	154: NT/4a Pearl Bluebush low open shrubland of the arid and semi-arid plains	700,000 (490,000 - 910,000) ha 280,000 - 520,000 ha (31 - 110 %) 5,000 - 9,100 ha (0.55 - 1.9 %)	<30% BHC <30% CP <30% DRP <30% MUL 30-70% MDD <30% RIV	<30% Lachlan >70% Lower MD <30% Murrumbidgee <30% Western	Kinchega NP Mallee Cliffs NP Mungo NP Tarawi NR Yanga NP	44,441 57,956 111,842 33,445 70,581	5,000 600 940 15 500	0.71 0.09 0.13 0 0.07	E1 E3 E2 E1 E3
CHS	155: NT/3a Bluebush shrubland on stony rises and downs of the arid zone	300,000 (210,000 - 390,000) ha 110,000 - 190,000 ha (28 - 90 %) 22,000 - 39,000 ha (5.6 - 19 %)	30-70% BHC <30% MUL <30% SSD	<30% Lower MD 30-70% Western	Mutawintji HS Mutawintji NP Mutawintji NR Paroo-Darling NP	597 67,581 6,711 176,427	3 18,700 2,000 9,900	0 6.23 0.67 3.3	M E1 E1 E3
CHS	156: NT/5a Bladder Saltbush shrubland on stony plains and downs of the arid zone	1,000,000 (700,000 - 1,300,000) ha 350,000 - 650,000 ha (27 - 93 %) 4,500 - 8,100 ha (0.35 - 1.2 %)	30-70% BHC <30% CHC <30% MUL <30% MDD <30% SSD	<30% Lower MD 30-70% Western	Mutawintji NP	67,581	6,300	0.63	E2
CHS	157: V/5a Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone	1,500,000 (1,100,000 - 1,900,000) ha 420,000 - 780,000 ha (22 - 71 %) 6,900 - 12,000 ha (0.36 - 1.1 %)	<30% DRP <30% MUL <30% MDD 30-70% RIV	<30% Central West 30-70% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee	Kalyarr NP Mungo NP Willandra NP Yanga NP Nanya Ballarat Uni VCA Scotia AWC VCA	14,936 111,842 18,835 70,581 28,849 64,528	2,500 6,700 10 500 78 3	0.17 0.45 0 0.03 0.01 0	E2 E2 E4 E2 E1 E1
CHS	158: E/5a Old Man Saltbush shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	250,000 (180,000 - 320,000) ha 15,000 - 45,000 ha (4.7 - 25 %) 830 - 2,400 ha (0.26 - 1.3 %)	30-70% CHC <30% CP <30% DRP <30% MUL	<30% Border R/Gwydir <30% Central West >70% Western	Kinchega NP Paroo-Darling NP Pindera Downs AA	44,441 176,427 11,790	154 1,000 500	0.06 0.4 0.2	M E2 E3
CHS	159: CE/5a Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	500,000 (350,000 - 650,000) ha 28,000 - 52,000 ha (4.3 - 15 %) 190 - 540 ha (0.029 - 0.15 %)	<30% DRP 30-70% MDD 30-70% RIV	<30% Lachlan >70% Lower MD <30% Murray <30% Murrumbidgee	Kalyarr NP Kemendok NR Willandra NP Yanga NP	14,936 1,063 18,835 70,581	275 50 1 40	0.06 0.01 0 0.01	E2 E3 E3 E3
CHS	160: LC/3a Nitre Goosefoot shrubland on clays of the inland floodplains	50,000 (25,000 - 75,000) ha 50,000 - 150,000 ha (67 - 600 %) 2,200 - 4,000 ha (2.9 - 16 %)	<30% BHC <30% CHC <30% DRP 30-70% MDD <30% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee 30-70% Western	Goonawarra NR Kalyarr NP Kemendok NR Kinchega NP Morrisons Lake NR Oolambeyan NP Willandra NP Yanga NP	410 14,936 1,063 44,441 319 21,839 18,835 70,581	25 470 200 667 15 49 1,400 300	0.05 0.94 0.4 1.33 0.03 0.1 2.8 0.6	E1 E2 E3 M E3 M E4 E3

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CHS	163: LC/1b Dillon Bush (Nitre Bush) shrubland/grassland of the semi-arid and arid zones	10,000 (7,000 - 13,000) ha 170,000 - 310,000 ha (1310 - 4430 %) 17,000 - 29,000 ha (130 - 410 %)	<30% MDD >70% RIV >30% SSD	<30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Kalyarr NP Mungo NP Nearie Lake NR Oolambeyan NP Willandra NP Yanga NP	14,936 111,842 4,354 21,839 18,835 70,581	115 10,000 965 50 300 11,500	1.15 100 9.65 0.5 3 115	E2 E3 M M E3 E3
CHS	164: LC/1a Cotton Bush open shrubland of the semi-arid (warm) zone	50,000 (35,000 - 65,000) ha 190,000 - 730,000 ha (290 - 2090 %) 11,000 - 19,000 ha (17 - 54 %)	<30% MDD >70% RIV	30-70% Lachlan <30% Lower MD <30% Murray 30-70% Murrumbidgee	Kalyarr NP Oolambeyan NP Willandra NP Yanga NP	14,936 21,839 18,835 70,581	150 1,000 6,000 8,000	0.3 2 12 16	E2 E2 E4 E3
CHS	166: LC/1a Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	20,000 (10,000 - 30,000) ha 75,000 - 220,000 ha (250 - 2200 %) 5,100 - 15,000 ha (17 - 150 %)	<30% DRP <30% MUL <30% MDD 30-70% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Kinchega NP Mungo NP Paroo-Darling NP	44,441 111,842 176,427	1,640 1,000 7,400	8.2 5 37	M E2 E2
CHS	168: NT/5a Copperburr shrubland of the NSW northern inland alluvial floodplains	50,000 (25,000 - 75,000) ha 65,000 - 190,000 ha (87 - 760 %) 93 - 270 ha (0.12 - 1.1 %)	<30% BBS >70% DRP	<30% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Kirramingly NR*	1,329	185	0.37	E1
CHS	195: E/5a Bladder Saltbush chenopod shrubland on alluvial soils mainly in the Darling Riverine Plain Bioregion.	200,000 (140,000 - 260,000) ha 21,000 - 39,000 ha (8.1 - 28 %) 0 - 0 ha (0 - 0 %)	>70% DRP <30% MUL	<30% Border R/Gwydir <30% Central West <30% Namoi 30-70% Western	Not Protected				
CHS	196: LC/5c Australian Boxthorn open shrubland	300 (150 - 450) ha 150 - 450 ha (33 - 300 %) 4 - 7 ha (0.78 - 4.3 %)	>70% MDD	>70% Lower MD	Mungo NP	111,842	5	1.67	E4
CHS	210: LC/1b Shrubby Twinleaf - saltbush open shrubland on silcrete scarps of the arid zone	5,000 (2,500 - 7,500) ha 2,500 - 7,500 ha (33 - 300 %) 2,500 - 7,500 ha (33 - 300 %)	>70% CHC	>70% Western	Sturt NP	338,232	5,000	100	E3
CHS	211: V/5b Slender-fruit Saltbush - Black Roly Poly low open shrubland of the Darling Riverine Plain	8,000 (4,000 - 12,000) ha 1,500 - 4,500 ha (13 - 110 %) 0 - 0 ha (0 - 0 %)	>70% DRP	<30% Border R/Gwydir <30% Central West 30-70% Namoi	Not Protected				
CHS	216: LC/2b Black Roly Poly low open shrubland of the Riverina and Murray-Darling Depression Bioregions	5,000 (2,500 - 7,500) ha 50,000 - 150,000 ha (670 - 6000 %) 790 - 2,300 ha (11 - 92 %)	<30% MDD 30-70% RIV	<30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee	Kalyarr NP Morrisons Lake NR Nombinnie NR Nombinnie SCA	14,936 319 72,128 53,261	1,300 30 240 10	26 0.6 4.8 0.2	E3 E2 E1 E1

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CHS	222: LC/5a Low Bluebush - Bladder Saltbush open shrubland of the arid zone	60,000 (30,000 - 90,000) ha 25,000 - 75,000 ha (28 - 250 %) 0 - 0 ha (0 - 0 %)	>70% BHC	>70% Western	Not Protected				
CHS	224: LC/5b Cotton Bush - copperburr open shrubland of the arid climate zone	1,000 (500 - 1,500) ha 5,000 - 15,000 ha (330 - 3000 %) 0 - 0 ha (0 - 0 %)	>70% BHC	>70% Western	Not Protected				
CHS	225: LC/5b Bladder Saltbush low open chenopod shrubland of the Strzelecki dunefields of the arid climate zone	5,000 (2,500 - 7,500) ha 2,000 - 6,000 ha (27 - 240 %) 0 - 0 ha (0 - 0 %)	>70% SSD	>70% Western	Not Protected				
CHS	236: LC/1b Giant Redburr low shrubland on alluvial plains of the semi-arid (warm) climate zone	1,000 (100 - 1,900) ha 75,000 - 220,000 ha (3950 - 220000 %) 920 - 1,700 ha (48 - 1700 %)	>70% RIV	30-70% Lachlan 30-70% Murrumbidgee	Goonawarra NR Kalyarr NP	410 14,936	10 1,300	1 130	E3 E3
CPW	019: E/5c Cypress Pine woodland of source-bordering dunes mainly on the Murray River floodplain.	800 (400 - 1,200) ha 280 - 520 ha (23 - 130 %) 16 - 28 ha (1.3 - 7 %)	>70% RIV	>70% Murray	Sanddune Pine FR AL9913 PA* DE9906 PA	60 16 43	8 8 6	1 1 0.75	M E1 M
CPW	021: CE/5b Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises of the semi-arid (warm) and arid climate zones	4,000 (2,000 - 6,000) ha 560 - 1,000 ha (9.3 - 50 %) 35 - 100 ha (0.58 - 5 %)	>70% MDD <30% RIV	30-70% Lower MD <30% Murray <30% Murrumbidgee	Mungo NP Yanga NP	111,842 70,581	20 50	0.5 1.25	E3 E3
CPW	028: V/4a White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	300,000 (210,000 - 390,000) ha 56,000 - 100,000 ha (14 - 48 %) 3,100 - 5,700 ha (0.79 - 2.7 %)	30-70% MDD 30-70% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee	Kalyarr NP Mallee Cliffs NP Mungo NP Oolambeyan NP Tarawi NR Willandra NP DE9905 PA VCA006 VCA	14,936 57,956 111,842 21,839 33,445 18,835 663 18	15 200 2,150 1,540 10 1 462 16	0.01 0.07 0.72 0.51 0 0 0.15 0.01	M E3 E2 M E3 E3 M M
CPW	048: CE/5b White Cypress Pine-Drooping Sheoak grassy open woodland of the Riverine Plain	5,000 (2,500 - 7,500) ha 250 - 750 ha (3.3 - 30 %) 0 - 0 ha (0 - 0 %)	<30% NSS >70% RIV	30-70% Murray <30% Murrumbidgee	Not Protected				
CPW	068: NT/3a White Cypress Pine - Mulga low open woodland on the stony ranges of the arid zone (far north western NSW).	15,000 (7,500 - 22,000) ha 5,000 - 15,000 ha (23 - 200 %) 980 - 1,800 ha (4.5 - 24 %)	<30% BHC <30% MUL	>70% Western	Mutawintji NP Mutawintji NR	67,581 6,711	1,000 400	6.67 2.67	E3 E3

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CPW	069: NT/5a White Cypress Pine - Mulga shrubland on plains and sandplains in the arid and semi-arid (hot summer) climate zones.	300,000 (150,000 - 450,000) ha 60,000 - 180,000 ha (13 - 120 %) 500 - 1,500 ha (0.11 - 1 %)	<30% BHC <30% CHC <30% CP <30% DRP 30-70% MUL <30% SSD	>70% Western	Narran Lake NR*	21,830	1,000	0.33	E2
CPW	070: V/5a White Cypress Pine woodland of central NSW	200,000 (100,000 - 300,000) ha 35,000 - 100,000 ha (12 - 100 %) 120 - 210 ha (0.04 - 0.21 %)	<30% BBS <30% CP <30% DRP <30% MDD 30-70% NSS	<30% Border R/Gwydir 30-70% Central West 30-70% Lachlan <30% Namoi	Boomi NR Midkin NR Strahorn FR*	157 374 72	37 90 40	0.02 0.05 0.02	M E1 E2
CPW	072: NT/3a White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion	200,000 (100,000 - 300,000) ha 60,000 - 180,000 ha (20 - 180 %) 8,300 - 15,000 ha (2.8 - 15 %)	>70% CP	30-70% Lachlan <30% Western	Kajuligah NR Nombinnie NR Nombinnie SCA Round Hill NR Scrubby Mountain FR Yathong NR WE9905 PA	13,826 72,128 53,261 13,642 1,704 108,768 819	50 2,800 7,000 27 500 1,300 129	0.03 1.4 3.5 0.01 0.25 0.65 0.06	E3 E2 E2 M E3 E2 M
CPW	106: LC/4a White Cypress Pine - Mulga low woodland on siliceous rocky ranges mainly of the Cobar Peneplain	150,000 (110,000 - 190,000) ha 84,000 - 150,000 ha (44 - 140 %) 3,700 - 6,700 ha (1.9 - 6.1 %)	>70% CP <30% MDD	<30% Central West <30% Lachlan <30% Western	Gundabooka NP Nombinnie NR Yathong NR	64,282 72,128 108,768	3,000 600 1,600	2 0.4 1.07	E2 M E1
CPW	245: LC/3a Pine - Belah low open woodland of the western Cobar Peneplain and northern Murray-Darling Depression Bioregions	155,000 (110,000 - 200,000) ha 98,000 - 180,000 ha (49 - 160 %) 12,000 - 21,000 ha (6 - 19 %)	30-70% CP 30-70% MDD	>70% Western	Paroo-Darling NP Yathong NR	176,427 108,768	5,000 11,800	3.23 7.61	E2 E3
CPW	246: LC/5a Pine shrubland of the western Cobar Peneplain Bioregion	180,000 (170,000 - 190,000) ha 160,000 - 180,000 ha (84 - 110 %) 0 - 0 ha (0 - 0 %)	>70% CP <30% MDD	>70% Western	Not Protected				
EBWP	056: V/5a Poplar Box - Belah woodland on clay-loam soils of the alluvial plains of north-central NSW	450,000 (180,000 - 720,000) ha 84,000 - 150,000 ha (12 - 83 %) 160 - 280 ha (0.022 - 0.16 %)	30-70% BBS <30% CP 30-70% DRP <30% NSS	30-70% Border R/Gwydir 30-70% Central West <30% Lachlan <30% Namoi	Boronga NR Macquarie Marshes NR	198 19,465	20 200	0 0.04	E3 M

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EBWP	075: E/5a Yellow Box - White Cypress Pine grassy woodland on deep sandy-loam alluvial soils of the eastern Riverina and western NSW S/W Slopes Bioregions	100,000 (50,000 - 150,000) ha 5,600 - 10,000 ha (3.7 - 20 %) 250 - 460 ha (0.17 - 0.92 %)	30-70% NSS 30-70% RIV	30-70% Murray 30-70% Murrumbidgee	Lake Urana NR Wilbertroy FR*	302 136	271 86	0.27 0.09	M E1
EBWP	076: CE/5a Inland Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	500,000 (350,000 - 650,000) ha 28,000 - 52,000 ha (4.3 - 15 %) 80 - 140 ha (0.012 - 0.04 %)	30-70% NSS <30% RIV	<30% Lachlan <30% Murray <30% Murrumbidgee	Flagstaff Memorial NR* Wiesners Swamp NR* AL9913 PA* HE9901 PA* NA9904 PA* VCA108 VCA*	18 102 16 33 43 4	10 20 8 33 38 4	0 0 0 0.01 0.01 0	E2 E1 E1 E2 E2 M
EBWP	080: E/5a Inland Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South-western Slopes and Riverina Bioregions	800,000 (560,000 - 1,000,000) ha 98,000 - 180,000 ha (9.8 - 32 %) 280 - 510 ha (0.028 - 0.091 %)	<30% NSS 30-70% RIV	<30% Lachlan <30% Murray <30% Murrumbidgee	Buckingbong FR* Gubbata NR Wilbertroy FR* AL9907 PA AL9908 PA AL9909 PA AL9910 PA AL9921 PA*	163 151 136 19 22 30 134 19	155 5 22 14 17 30 134 19	0.02 0 0 0 0 0 0.02 0	M E1 E1 E1 E1 M M E1
EBWP	082: E/5a Inland Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	400,000 (280,000 - 520,000) ha 70,000 - 130,000 ha (13 - 46 %) 1,300 - 1,500 ha (0.25 - 0.54 %)	30-70% CP <30% MDD <30% NSS	30-70% Central West 30-70% Lachlan <30% Western	Cocoparra NP Cocoparra NR Strahorn FR* Woggoon NR CD9910 PA* WE9902 PA*	8,364 4,775 72 6,113 36 57	710 417 30 200 36 15	0.18 0.1 0.01 0.05 0.01 0	M M E3 E1 E1 E1
EBWP	083: E/5a Yellow Box woodland on sandy loam soils on alluvial plains mainly in the upper Darling Riverine Plain Bioregion	30,000 (15,000 - 45,000) ha 3,000 - 9,000 ha (6.7 - 60 %) 0 - 0 ha (0 - 0 %)	>70% DRP <30% NSS	30-70% Central West <30% Namoi	Not Protected				
EBWP	086: E/5c Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion	800 (560 - 1,000) ha 140 - 260 ha (14 - 46 %) 0 - 0 ha (0 - 0 %)	>70% RIV	>70% Murray	Not Protected				
EBWP	087: V/5a Poplar Box - Coolabah floodplain woodland on light clay soil mainly in the Darling Riverine Plain Bioregion	600,000 (300,000 - 900,000) ha 120,000 - 360,000 ha (13 - 120 %) 1,300 - 2,300 ha (0.14 - 0.77 %)	>70% DRP	30-70% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Boomi West NR Budelah NR Culgoa NP Narran Lake NR*	148 4,049 24,965 21,830	2 25 1,100 665	0 0 0.18 0.11	M M E3 E2

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EBWP	088: E/5a Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	200,000 (100,000 - 300,000) ha 30,000 - 90,000 ha (10 - 90 %) 63 - 110 ha (0.021 - 0.11 %)	>70% BBS <30% DRP	<30% Border R/Gwydir <30% Central West 30-70% Namoi	Brigalow Park NR* VCA088 VCA*	453 96	85 4	0.04 0	E2 E3
EBWP	098: NT/5a Poplar Box - White Cypress Pine shrubby woodland on red sandy loam soils mainly on stagnant alluvial plains	500,000 (350,000 - 650,000) ha 210,000 - 390,000 ha (32 - 110 %) 3,300 - 5,900 ha (0.51 - 1.7 %)	30-70% DRP <30% MUL	30-70% Border R/Gwydir <30% Central West <30% Namoi	Boronga NR Culgoa NP Narran Lake NR*	198 24,965 21,830	75 1,510 3,000	0.02 0.3 0.6	E2 M E2
EBWP	103: NT/4a Poplar Box - Gum-barked Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	800,000 (560,000 - 1,000,000) ha 350,000 - 650,000 ha (35 - 120 %) 9,100 - 16,000 ha (0.91 - 2.9 %)	>70% CP <30% MDD	<30% Central West <30% Lachlan 30-70% Western	Gundabooka NP Quanda NR Tollingo NR Woggoon NR CD9902 PA	64,282 4,767 3,247 6,113 30	10,000 2,520 50 410 15	1.25 0.32 0.01 0.05 0	E3 E1 M E2 M
EBWP	104: LC/4a Smooth-barked Coolabah woodland on sedimentary substrates mainly in the Cobar Peneplain Bioregion	1,000,000 (500,000 - 1,500,000) ha 380,000 - 1,100,000 ha (25 - 220 %) 9,400 - 17,000 ha (0.63 - 3.4 %)	30-70% CP <30% MUL <30% MDD	<30% Central West <30% Lachlan 30-70% Western	Loughnan NR Mount Grenfell HS Nombinnie NR Nombinnie SCA Round Hill NR Yathong NR	390 1,365 72,128 53,261 13,642 108,768	20 60 2,000 1,000 332 10,000	0 0.01 0.2 0.1 0.03 1	E1 E2 E2 E2 E1 E2
EBWP	105: NT/5a Poplar Box grassy woodland on flats mainly in the Cobar Peneplain and Murray-Darling Depression Bioregions	900,000 (630,000 - 1,100,000) ha 350,000 - 650,000 ha (32 - 100 %) 6,300 - 11,000 ha (0.57 - 1.7 %)	>70% CP <30% MDD	30-70% Central West <30% Lachlan <30% Western	Nombinnie NR Nombinnie SCA Scrubby Mountain FR Yathong NR CD9901 PA	72,128 53,261 1,704 108,768 229	600 1,000 5 7,300 2	0.07 0.11 0 0.81 0	E2 E3 E2 E2 E2
EBWP	108: LC/4a Smooth-barked Coolabah - Mulga open woodland on gravelly ridges of the Cobar Peneplain Bioregion	450,000 (320,000 - 580,000) ha 250,000 - 450,000 ha (43 - 140 %) 11,000 - 20,000 ha (1.9 - 6.3 %)	>70% CP <30% MDD	<30% Central West <30% Lachlan 30-70% Western	Gundabooka NP Mount Grenfell HS	64,282 1,365	15,000 400	3.33 0.09	E3 E2
EBWP	109: LC/4a Poplar Box-Mulga woodland on red loam soils on plains in the Cobar Peneplain and eastern Mulga Lands Bioregions	700,000 (490,000 - 910,000) ha 390,000 - 710,000 ha (43 - 140 %) 7,600 - 22,000 ha (0.84 - 4.5 %)	30-70% CP <30% DRP <30% MUL	<30% Central West >70% Western	Gundabooka NP Ledknapper NR Paroo-Darling NP	64,282 30,759 176,427	8,000 6,540 500	1.14 0.93 0.07	E3 M E4
EBWP	110: V/5a Inland Grey Box - Black Cypress Pine shrubby woodland on stony slopes NSW South Western Slopes and Riverina Bioregions	40,000 (20,000 - 60,000) ha 5,000 - 15,000 ha (8.3 - 75 %) 210 - 370 ha (0.35 - 1.9 %)	<30% CP >70% NSS	<30% Lachlan <30% Murray <30% Murrumbidgee	Cocoparra NP Cocoparra NR Nangar NP* The Rock NR*	8,364 4,775 9,356 343	100 41 17 130	0.25 0.1 0.04 0.33	M M M E2

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EBWP	122: LC/1b Smooth-barked Coolabah woodland of Peery Hills sandslope, Mulga Lands Bioregion	3,500 (2,500 - 4,500) ha 2,300 - 4,200 ha (51 - 170 %) 3,000 - 3,500 ha (67 - 140 %)	>70% MUL	>70% Western	Paroo-Darling NP	176,427	3,264	93.26	M
EBWP	201: CE/5a Fuzzy Box - Inland Grey Box on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	100,000 (70,000 - 130,000) ha 4,200 - 7,800 ha (3.2 - 11 %) 54 - 100 ha (0.042 - 0.14 %)	<30% BBS <30% CP >70% NSS	<30% Central West 30-70% Lachlan <30% Murrumbidgee	Coolbaggie NR* Weddin Mountains NP*	1,773 8,697	50 27	0.05 0.03	E2 M
EBWP	207: LC/3a Poplar Box grassy low woodland of drainage lines and depressions of the semi-arid (hot) and arid zone climate zones	200,000 (100,000 - 300,000) ha 85,000 - 250,000 ha (28 - 250 %) 9,200 - 16,000 ha (3.1 - 16 %)	<30% BHC <30% CHC <30% CP <30% MUL <30% MDD	>70% Western	Gundabooka NP Kajuligah NR Nocoleche NR Paroo-Darling NP	64,282 13,826 71,068 176,427	5,000 1,400 2,000 4,620	2.5 0.7 1 2.31	E3 E3 E4 E1
EBWP	244: E/5a Poplar Box grassy/shrubby woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	1,500,000 (1,100,000 - 1,900,000) ha 280,000 - 520,000 ha (15 - 47 %) 170 - 480 ha (0.0089 - 0.044 %)	<30% BBS 30-70% DRP <30% NSS	30-70% Border R/Gwydir <30% Central West <30% Lachlan <30% Namoi	Boomi NR Boomi West NR Budelah NR Midkin NR NY9902 PA	157 148 4,049 374 20	16 76 22 190 20	0 0.01 0 0.01 0	M M M M M
EBWP	248: E/5a Mixed box woodland on low sandy-loam rises on alluvial plains in central western NSW	50,000 (25,000 - 75,000) ha 5,000 - 15,000 ha (6.7 - 60 %) 0 - 0 ha (0 - 0 %)	30-70% CP 30-70% NSS	<30% Central West 30-70% Lachlan	Not Protected				
EBWP	258: NT/5a Smooth-barked Coolabah on granite low hills in the eastern Cobar Peneplain Bioregion	50,000 (35,000 - 65,000) ha 28,000 - 52,000 ha (43 - 150 %) 0 - 0 ha (0 - 0 %)	>70% CP	>70% Central West	Not Protected				
EGA	150: LC/3a Bottlewasher - copperburr grassland of the arid zone.	30,000 (3,000 - 57,000) ha 13,000 - 240,000 ha (23 - 8000 %) 3,000 - 9,000 ha (5.3 - 300 %)	<30% BHC <30% MUL <30% MDD	<30% Lower MD >70% Western	Kinchega NP Sturt NP	44,441 338,232	4,000 2,000	13.33 6.67	E4 E3
EGA	167: LC/5a Kerosene Grass - Mulka grass - short grassland/forbland of the arid zone	130,000 (65,000 - 190,000) ha 65,000 - 190,000 ha (34 - 290 %) 500 - 1,500 ha (0.26 - 2.3 %)	30-70% BHC <30% CHC <30% MUL	>70% Western	Sturt NP	338,232	1,000	0.77	E3

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EIW	002: NT/3a River Red Gum-sedge dominated tall open forest in frequently flooded sites of the semi-arid warm climate zone	35,000 (25,000 - 45,000) ha 21,000 - 39,000 ha (47 - 160 %) 3,100 - 5,600 ha (6.9 - 22 %)	<30% NSS >70% RIV	>70% Murray <30% Murrumbidgee	Billabong FR Lake Urana NR Moira Lakes FR Native Dog FR Pollack FR Sanddune Pine FR Snake Island FR Toupna Creek FR Wiesners Swamp NR* Yanga NP	334 302 1,441 44 714 60 37 79 102 70,581	50 9 40 43 100 10 5 2 70 4,000	0.14 0.03 0.11 0.12 0.29 0.03 0.01 0.01 0.2 11.43	E3 M E3 E3 E3 E3 E3 E3 E1 E3
EIW	005: NT/4a River Red Gum herbaceous-grassy tall open forest of the inner floodplains of the lower NSW South West Slopes and Riverina Bioregions	15,000 (7,500 - 22,000) ha 4,500 - 13,000 ha (20 - 170 %) 200 - 360 ha (0.91 - 4.8 %)	30-70% NSS 30-70% RIV	>70% Murray <30% Murrumbidgee	Billabong FR Moira Lakes FR Narrandera FR Narrandera NR* Snake Island FR Toupna Creek FR Wilbertroy FR*	334 1,441 14 59 37 79 136	110 50 12 50 30 10 20	0.73 0.33 0.08 0.33 0.2 0.07 0.13	E3 E3 E1 E2 E3 E3 E3
EIW	007: NT/3a River Red Gum - herbaceous tall open forest mainly in the Riverina Bioregion	100,000 (70,000 - 130,000) ha 60,000 - 110,000 ha (46 - 160 %) 6,100 - 11,000 ha (4.7 - 16 %)	>70% RIV	<30% Lachlan >70% Murray <30% Murrumbidgee	Kalyarr NP Pollack FR Sanddune Pine FR Toupna Creek FR Yanga NP DE9906 PA	14,936 714 60 79 70,581 43	70 530 20 30 8,000 25	0.07 0.53 0.02 0.03 8 0.03	M E3 E3 E3 E3 M
EIW	008: LC/4a River Red Gum - Warrego Grass - Couch Grass riparian tall woodland of the semi-arid (warm) climate zone	30,000 (21,000 - 39,000) ha 18,000 - 32,000 ha (46 - 150 %) 230 - 410 ha (0.59 - 2 %)	<30% DRP 30-70% RIV	30-70% Lower MD 30-70% Murray	Kemendok NR Moira Lakes FR Peacock Creek FR HA9904 PA VCA105 VCA	1,063 1,441 99 14 38	50 200 60 2 10	0.17 0.67 0.2 0.01 0.03	E3 E3 E3 M E1
EIW	009: V/3a River Red Gum - wallaby grass tall woodland on the outer River Red Gum zone in the semi-arid (warm) climate zone	35,000 (25,000 - 45,000) ha 11,000 - 19,000 ha (24 - 76 %) 810 - 1,400 ha (1.8 - 5.6 %)	<30% NSS >70% RIV	>70% Murray <30% Murrumbidgee	Billabong FR Moira Lakes FR Yanga NP	334 1,441 70,581	117 30 1,000	0.33 0.09 2.86	E3 E3 E3
EIW	010: NT/5a River Red Gum - Black Box woodland of the semi-arid (warm) climatic zone	70,000 (49,000 - 91,000) ha 28,000 - 52,000 ha (31 - 110 %) 93 - 170 ha (0.1 - 0.35 %)	<30% MDD >70% RIV	<30% Lachlan 30-70% Murray <30% Murrumbidgee	Kalyarr NP Kemendok NR Peacock Creek FR HA9904 PA	14,936 1,063 99 14	30 64 30 8	0.04 0.09 0.04 0.01	E1 M E3 M

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EIW	011: NT/3a River Red Gum - Lignum very tall open forest or woodland on floodplains of semi-arid (warm) climate zone	60,000 (42,000 - 78,000) ha 25,000 - 45,000 ha (32 - 110 %) 4,600 - 8,400 ha (5.9 - 20 %)	<30% CP <30% MDD >70% RIV	<30% Lachlan 30-70% Lower MD 30-70% Murray <30% Murrumbidgee	Goonawarra NR Kalyarr NP Kemendok NR Kinchega NP Yanga NP	410 14,936 1,063 44,441 70,581	300 80 300 814 5,000	0.5 0.13 0.5 1.36 8.33	E1 E1 E2 M E3
EIW	013: V/3a Blackbox - Lignum woodland of the inner floodplains in the semi-arid (warm) climate zone	350,000 (180,000 - 520,000) ha 110,000 - 190,000 ha (21 - 110 %) 22,000 - 39,000 ha (4.2 - 22 %)	<30% CP <30% DRP >70% RIV	<30% Lachlan 30-70% Lower MD 30-70% Murray <30% Murrumbidgee	Kalyarr NP Kemendok NR Kinchega NP Morrisons Lake NR Oolambeyan NP Peacock Creek FR Willandra NP Yanga NP	14,936 1,063 44,441 319 21,839 99 18,835 70,581	830 330 8,600 40 297 5 3,560 17,000	0.24 0.09 2.46 0.01 0.08 0 1.02 4.86	E1 E2 M E2 M E4 E3 E3
EIW	015: NT/4a Black Box open woodland with chenopod understorey mainly on the outer floodplains in south-western NSW	500,000 (350,000 - 650,000) ha 180,000 - 320,000 ha (28 - 91 %) 9,300 - 17,000 ha (1.4 - 4.9 %)	<30% DRP <30% MDD >70% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee	Kinchega NP Nearie Lake NR Willandra NP Yanga NP VCA105 VCA	44,441 4,354 18,835 70,581 38	7,875 282 90 5,000 20	1.58 0.06 0.02 1 0	M M E3 E3 E1
EIW	016: NT/5a Black Box grassy open woodland of rarely flooded depressions in south western NSW	200,000 (100,000 - 300,000) ha 50,000 - 150,000 ha (17 - 150 %) 240 - 430 ha (0.08 - 0.43 %)	<30% DRP 30-70% MDD 30-70% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee	Kajuligah NR Mallee Cliffs NP Nombinnie NR LE9801 PA Scotia AWC VCA	13,826 57,956 72,128 11 64,528	100 10 163 11 50	0.05 0.01 0.08 0.01 0.03	E3 E2 M M E3
EIW	036: V/4a River Red Gum open forest and woodland mainly of the Darling Riverine Plains Bioregion	300,000 (210,000 - 390,000) ha 110,000 - 190,000 ha (28 - 90 %) 6,600 - 8,000 ha (1.7 - 3.8 %)	<30% BBS >70% DRP <30% MUL	<30% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Budelah NR Culgoa NP Gundabooka NP Macquarie Marshes NR Narran Lake NR* Paroo-Darling SCA VCA022 VCA	4,049 24,965 64,282 19,465 21,830 41,457 19	230 74 500 6,000 87 420 9	0.08 0.02 0.17 2 0.03 0.14 0	M M E2 E1 M E2 E1
EIW	037: V/4a Black Box woodland on floodplains mainly in the Darling Riverine Plains Bioregion.	900,000 (630,000 - 1,100,000) ha 280,000 - 520,000 ha (25 - 83 %) 8,300 - 15,000 ha (0.75 - 2.4 %)	<30% CP >70% DRP <30% MUL	<30% Border R/Gwydir 30-70% Central West <30% Namoi <30% Western	Culgoa NP Gundabooka NP Macquarie Marshes NR Paroo-Darling NP Paroo-Darling SCA	24,965 64,282 19,465 176,427 41,457	2,500 500 609 1,440 6,800	0.28 0.06 0.07 0.16 0.76	M E3 M E2 E3

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EIW	038: LC/3a Black Box low woodland lining ephemeral watercourses or fringing lakes and clay pans of semi-arid (hot) and arid zones	50,000 (25,000 - 75,000) ha 20,000 - 60,000 ha (27 - 240 %) 4,400 - 7,900 ha (5.9 - 32 %)	<30% BHC >70% CHC >30% MUL <30% MDD <30% SSD	>70% Western	Nocoleche NR Paroo-Darling NP	71,068 176,427	5,000 1,150	10 2.3	E3 M
EIW	039: E/4a Coolabah - River Coobah - Lignum woodland of frequently flooded channels mainly of the Darling Riverine Plains Bioregion	350,000 (250,000 - 450,000) ha 98,000 - 180,000 ha (22 - 72 %) 15,000 - 17,000 ha (3.3 - 6.8 %)	>70% DRP <30% MUL	30-70% Border R/Gwydir <30% Central West <30% Namoi 30-70% Western	Budelah NR Culgoa NP Narran Lake NR* Nocoleche NR Paroo-Darling NP Paroo-Darling SCA VCA022 VCA	4,049 24,965 21,830 71,068 176,427 41,457 19	93 6,600 50 5,000 3,500 440 10	0.03 1.89 0.01 1.43 1 0.13 0	E1 E1 E3 E3 E2 E3 E1
EIW	040: E/4a Coolabah open woodland with chenopod/grassy ground cover on grey and brown clay floodplains	1,100,000 (770,000 - 1,400,000) ha 300,000 - 540,000 ha (21 - 70 %) 10,000 - 18,000 ha (0.71 - 2.3 %)	<30% BBS >70% DRP <30% MUL	30-70% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Boomi NR Boomi West NR Budelah NR Culgoa NP Gundabooka NP Macquarie Marshes NR Midkin NR Narran Lake NR* Paroo-Darling NP Paroo-Darling SCA	157 148 4,049 24,965 64,282 19,465 374 21,830 176,427 41,457	23 28 1,840 6,000 1,000 395 10 570 4,000 300	0 0 0.17 0.55 0.09 0.04 0 0.05 0.36 0.03	E1 E1 E1 E1 E3 M M E2 E2 E3
EIW	041: LC/2a River Red Gum open woodland of intermittent watercourses mainly of the arid climate zone	40,000 (28,000 - 52,000) ha 25,000 - 45,000 ha (48 - 160 %) 4,900 - 8,900 ha (9.4 - 32 %)	<30% BHC <30% CHC <30% MUL <30% SSD	>70% Western	Mutawintji NP Mutawintji NR Paroo-Darling NP Sturt NP	67,581 6,711 176,427 338,232	1,780 140 3,000 2,000	4.45 0.35 7.5 5	M E1 E1 E2
EIW	067: LC/3a Yapunyah woodland of Cuttaburra-Paroo River system, Mulga Lands Bioregion	250,000 (180,000 - 320,000) ha 160,000 - 280,000 ha (50 - 160 %) 15,000 - 27,000 ha (4.7 - 15 %)	>70% MUL	>70% Western	Nocoleche NR Paroo-Darling NP	71,068 176,427	20,000 800	8 0.32	E3 E1
EIW	074: E/5a Riverine Yellow Box - River Red Gum tall grassy woodland of NSW South West Slopes and Riverina Bioregions	30,000 (21,000 - 39,000) ha 5,600 - 10,000 ha (14 - 48 %) 19 - 35 ha (0.049 - 0.17 %)	30-70% NSS 30-70% RIV	<30% Lachlan <30% Murray <30% Murrumbidgee	Narrandera NR* Sanddune Pine FR Toupna Creek FR DE9906 PA	59 60 79 43	8 3 13 3	0.03 0.01 0.04 0.01	E2 E3 E3 M
EIW	197: NT/3a Black Box - Gidgee - chenopod low open woodland on alluvial clay soils mainly of the Darling Riverine Plain Bioregion	15,000 (7,500 - 22,000) ha 5,000 - 15,000 ha (23 - 200 %) 1,400 - 1,600 ha (6.4 - 21 %)	30-70% DRP 30-70% MUL	>70% Western	Culgoa NP	24,965	1,500	10	E1

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EIW	200: LC/4b River Red Gum woodland of lake fringes in the semi-arid (hot) and arid climate zones	4,500 (3,200 - 5,800) ha 2,900 - 5,300 ha (50 - 170 %) 350 - 650 ha (6 - 20 %)	30-70% CHC 30-70% MUL	>70% Western	Paroo-Darling NP	176,427	500	11.11	E2
EIW	206: V/5a Dirty Gum tall woodland of alluvial sandy lenses (sand monkeys) mainly of the Darling Riverine Plain Bioregion	50,000 (35,000 - 65,000) ha 16,000 - 28,000 ha (25 - 80 %) 150 - 260 ha (0.23 - 0.74 %)	<30% BBS >70% DRP	30-70% Border R/Gwydir <30% Central West <30% Namoi	Boronga NR Budelah NR Sand Monkey FR* Sandgate FR	198 4,049 80 15	5 122 60 15	0.01 0.24 0.12 0.03	E3 M E3 M
EIW	208: LC/4b River Red Gum low woodland of rocky gorges and creeks in the Cobar Peneplain	6,000 (4,200 - 7,800) ha 3,900 - 7,100 ha (50 - 170 %) 270 - 810 ha (3.5 - 19 %)	>70% CP	<30% Central West <30% Lachlan >70% Western	Gundabooka NP Mount Grenfell HS	64,282 1,365	500 40	8.33 0.67	E3 E2
EIW	230: LC/3b Coolabah woodland of intermittent watercourses in arid zone, mainly in the Channel Country Bioregion	6,000 (3,000 - 9,000) ha 2,500 - 7,500 ha (28 - 250 %) 740 - 1,300 ha (8.2 - 43 %)	>70% CHC	>70% Western	Pindera Downs AA Sturt NP	11,790 338,232	50 1,000	0.83 16.67	E3 E3
EIW	231: LC/2b Coolabah open woodland dunefield depressions of the arid zone	3,000 (1,500 - 4,500) ha 1,400 - 4,200 ha (31 - 280 %) 500 - 1,500 ha (11 - 100 %)	>70% SSD	>70% Western	Sturt NP	338,232	1,000	33.33	E3
EIW	233: LC/5a River Red Gum - Poplar Box grassy woodland on Quaternary alluvial sandy-loam soils of the Cobar Peneplain	20,000 (10,000 - 30,000) ha 9,000 - 27,000 ha (30 - 270 %) 36 - 44 ha (0.12 - 0.44 %)	>70% CP	>70% Western	Mount Grenfell HS	1,365	40	0.2	E2
EIW	234: LC/4b River Red Gum woodland of rocky creeks in the ranges of the arid climate zone	10,000 (5,000 - 15,000) ha 4,500 - 13,000 ha (30 - 260 %) 940 - 1,700 ha (6.3 - 34 %)	30-70% BHC 30-70% CHC <30% MUL	>70% Western	Mutawintji HS Mutawintji NP Mutawintji NR Sturt NP	597 67,581 6,711 338,232	43 600 197 500	0.43 6 1.97 5	M E1 M E3
EIW	237: V/5a Riverine Inland Grey Box grassy woodland of the semi-arid (warm) climate zone	12,000 (6,000 - 18,000) ha 2,800 - 5,200 ha (16 - 87 %) 9 - 27 ha (0.05 - 0.45 %)	30-70% NSS 30-70% RIV	<30% Lachlan 30-70% Murray <30% Murrumbidgee	Billabong FR Sanddune Pine FR Toupna Creek FR	334 60 79	2 3 13	0.02 0.03 0.11	E3 E3 E3
EIW	249: V/5b River Red Gum grass - swamp tall woodland of depressions (cowals) on floodplains and alluvial plains	5,000 (2,500 - 7,500) ha 1,000 - 3,000 ha (13 - 120 %) 0 - 0 ha (0 - 0 %)	<30% DRP 30-70% NSS <30% RIV	30-70% Central West <30% Lachlan <30% Murrumbidgee	Not Protected				
EIW	251: E/5a Mixed Eucalypt woodlands of floodplains in the southern-eastern Cobar Peneplain Bioregion	35,000 (18,000 - 52,000) ha 5,000 - 15,000 ha (9.6 - 83 %) 62 - 110 ha (0.12 - 0.61 %)	30-70% CP 30-70% NSS	>70% Lachlan <30% Murrumbidgee	CD9901 PA	229	88	0.25	E2

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EIWI	192: NT/5a Silver-leaved Ironbark - Poplar Box woodland mainly on gravelly ridges of the north-western plains of NSW	150,000 (110,000 - 190,000) ha 70,000 - 130,000 ha (37 - 120 %) 500 - 1,500 ha (0.26 - 1.4 %)	30-70% BBS 30-70% DRP <30% MUL	30-70% Border R/Gwydir 30-70% Western	Narran Lake NR*	21,830	1,000	0.67	E2
EIWI	217: V/3a Mugga Ironbark - Inland Grey Box - Pine tall woodland of the NSW South Western Slopes Bioregion	60,000 (30,000 - 90,000) ha 13,000 - 37,000 ha (14 - 120 %) 4,300 - 5,100 ha (4.8 - 17 %)	>70% NSS <30% RIV	<30% Central West 30-70% Lachlan <30% Murrumbidgee	Big Bush NR* Blue Mallee FR* Buddigower NR* Ingalba NR* Pucawan NR* The Charcoal Tank NR* PA9902 PA* VCA008 VCA*	643 66 329 4,179 287 84 248 400	450 10 120 3,550 225 42 248 31	0.75 0.02 0.2 5.92 0.38 0.07 0.41 0.05	M E3 E2 M M E2 E1 M
EIWI	227: E/5b Silver-leaved Ironbark - White Cypress Pine on alluvial sandy loam soils in central-north NSW	5,000 (2,500 - 7,500) ha 350 - 1,000 ha (4.7 - 40 %) 18 - 22 ha (0.24 - 0.88 %)	>70% DRP	<30% Border R/Gwydir 30-70% Central West <30% Namoi	Midkin NR	374	20	0.4	E1
EIWI	243: NT/4a Mugga Ironbark - White Cypress Pine woodland on sedimentary or metamorphic low rises in the temperate (hot summer) climate zone	40,000 (28,000 - 52,000) ha 21,000 - 39,000 ha (40 - 140 %) 280 - 340 ha (0.54 - 1.2 %)	<30% CP >70% NSS <30% RIV	30-70% Lachlan <30% Murrumbidgee	CD9907 PA CD9911 PA	343 410	182 128	0.46 0.32	M M
EMDI	115: NT/5b Eurah shrubland of inland floodplains	5,000 (2,500 - 7,500) ha 1,400 - 2,600 ha (19 - 100 %) 0 - 0 ha (0 - 0 %)	>70% DRP	>70% Border R/Gwydir <30% Namoi <30% Western	Not Protected				
EMDI	138: NT/4b Desert Paper-bark shrubland of semi-arid and arid climate zone watercourses.	3,000 (1,500 - 4,500) ha 2,000 - 3,600 ha (44 - 240 %) 180 - 220 ha (4 - 15 %)	30-70% BHC <30% CHC <30% CP	>70% Western	Gundabooka NP Sturt NP	64,282 338,232	100 100	3.33 3.33	E3 E3
EMDI	140: LC/5c Broombush shrubland in dunefields of the arid climate zone	800 (400 - 1,200) ha 400 - 1,200 ha (33 - 300 %) 50 - 150 ha (4.2 - 38 %)	>70% SSD	>70% Western	Sturt NP	338,232	100	12.5	E3
EMDI	142: V/5b Broombush shrubland in the mallee landscapes of the temperate and semi-arid (warm) climate zones	10,000 (5,000 - 15,000) ha 1,500 - 4,500 ha (10 - 90 %) 200 - 570 ha (1.3 - 11 %)	<30% CP >70% MDD	30-70% Lachlan <30% Murrumbidgee	Cocoparra NP Cocoparra NR Loughnan NR Nombinnie NR Pulletop NR Yathong NR	8,364 4,775 390 72,128 145 108,768	20 28 5 220 10 100	0.2 0.28 0.05 2.2 0.1 1	E1 E1 E3 E2 E2 E4

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EMDI	143: LC/1a Narrow-leaved Hopbush-Scrub Turpentine-Senna shrubland of semi-arid and arid sandplains and dunes.	100,000 (10,000 - 190,000) ha 180,000 - 320,000 ha (95 - 3200 %) 36,000 - 65,000 ha (19 - 650 %)	<30% BHC <30% DRP <30% MUL 30-70% MDD	<30% Lachlan >70% Lower MD <30% Murrumbidgee <30% Western	Kinchega NP Mallee Cliffs NP Mungo NP Mutawintji NP Mutawintji NR Nocoleche NR Paroo-Darling NP Tarawi NR Willandra NP Nanya Ballarat Uni VCA Scotia AWC VCA	44,441 57,956 111,842 67,581 6,711 71,068 176,427 33,445 18,835 28,849 64,528	1,760 500 1,000 9,000 200 1,000 15,500 6,880 100 3,750 11,000	1.76 0.5 1 9 0.2 1 15.5 6.88 0.1 3.75 11	M E3 E2 E1 E1 E3 E2 E2 E4 E1 E2
EMDI	194: LC/3a Heather Bush - Umbrella Mulga open shrubland of the semi-arid zone	80,000 (56,000 - 100,000) ha 56,000 - 100,000 ha (56 - 180 %) 3,700 - 4,400 ha (3.7 - 7.9 %)	>70% MUL	>70% Western	Ledknapper NR	30,759	4,014	5.02	E1
EMDI	213: V/4b Murray's Wattle sparse shrubland/forbland on sand rises of the Darling Riverine Plain Bioregion	2,000 (1,000 - 3,000) ha 500 - 1,500 ha (17 - 150 %) 140 - 260 ha (4.7 - 26 %)	>70% DRP	>70% Western	Narran Lake NR*	21,830	200	10	E4
EMDI	229: LC/1b Derived mixed shrubland on loamy-clay soils in the Cobar Peneplain Bioregion	1,000 (700 - 1,300) ha 140,000 - 260,000 ha (10770 - 37140 %) 7,000 - 12,000 ha (540 - 1710 %)	>70% CP	>70% Western	Gundabooka NP Mount Grenfell HS Nombinnie SCA Yathong NR	64,282 1,365 53,261 108,768	9,000 35 300 600	900 3.5 30 60	E2 E1 E2 E2
EMDI	232: LC/1a Senna - Mulga - Needlewood open shrubland on loam-clay soils in swales and on the edges of claypans in the arid zone	30,000 (15,000 - 45,000) ha 15,000 - 45,000 ha (33 - 300 %) 5,000 - 15,000 ha (11 - 100 %)	>70% SSD	>70% Western	Sturt NP	338,232	10,000	33.33	E3
EMDI	252: V/5a Sugarwood open woodland of the inland plains mainly Murray-Darling Depression Bioregion	30,000 (15,000 - 45,000) ha 7,500 - 22,000 ha (17 - 150 %) 120 - 360 ha (0.27 - 2.4 %)	>70% MDD	>70% Lower MD	Tarawi NR Scotia AWC VCA	33,445 64,528	40 200	0.13 0.67	E3 E3
EMDI	261: NT/3c Swamp Paper-bark shrubland on edges of depressions in the Mulga Lands Bioregion	500 (150 - 850) ha 140 - 760 ha (16 - 510 %) 100 - 300 ha (12 - 200 %)	>70% MUL	>70% Western	Nocoleche NR	71,068	200	40	E1

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EWRHI	184: LC/4a Dwyers Red Gum - Currawang low woodland mainly of the Cobar Peneplain Bioregion	100,000 (70,000 - 130,000) ha 56,000 - 100,000 ha (43 - 140 %) 2,400 - 4,300 ha (1.8 - 6.1 %)	>70% CP <30% MDD	<30% Central West 30-70% Lachlan <30% Western	Nombinnie NR Round Hill NR Scrubby Mountain FR Yathong NR CD9907 PA VCA008 VCA* WE9905 PA	72,128 13,642 1,704 108,768 343 400 819	13 123 400 1,850 20 245 674	0.01 0.12 0.4 1.85 0.02 0.25 0.67	M M E3 E2 M M M
EWRHI	185: LC/4a Dwyers Red Gum - White Cypress Pine - Currawang shrubby woodland mainly of the NSW South Western Slopes Bioregion	100,000 (70,000 - 130,000) ha 56,000 - 100,000 ha (43 - 140 %) 1,500 - 2,700 ha (1.2 - 3.9 %)	<30% CP >70% NSS	<30% Lachlan <30% Murray <30% Murrumbidgee	Buddigower NR* Cocoparra NP Cocoparra NR WE9904 PA*	329 8,364 4,775 84	40 1,100 897 84	0.04 1.1 0.9 0.08	E1 M M E1
EWRHI	186: LC/2a Dwyer's Mallee - Black Cypress Pine - Currawang woodland on rocky hills mainly in the NSW South Western Slopes Bioregion	130,000 (65,000 - 190,000) ha 50,000 - 150,000 ha (26 - 230 %) 16,000 - 29,000 ha (8.4 - 45 %)	<30% CP >70% NSS	30-70% Lachlan <30% Murray 30-70% Murrumbidgee	Benambra NP* Blue Mallee FR* Boginderra Hills NR* Cocoparra NP Cocoparra NR Eugowra NR* Goobang NP* Ingalba NR* Livingstone NP* Livingstone SCA* Mudjarn NR* Tabletop NR* The Charcoal Tank NR* The Rock NR* Ulandra NR* Weddin Mountains NP* Woomargama NP* CO9801 PA*	1,400 66 798 8,364 4,775 115 42,352 4,179 1,918 485 590 102 84 343 3,958 8,697 24,189 525	72 10 133 6,100 3,200 100 500 400 390 17 332 64 2 193 1,728 5,196 3,807 525	0.06 0.01 0.1 4.69 2.46 0.08 0.38 0.31 0.3 0.01 0.26 0.05 0 0.15 1.33 4 2.93 0.4	E1 E3 M M M M E1 E2 E1 E1 E1 E2 E1 E2 E1 M E1 M
EWRHI	188: NT/5c Dwyer's Red Gum - Quinine Tree open woodland on igneous intrusive hills of the Macquarie River floodplain	390 (360 - 420) ha 280 - 340 ha (67 - 94 %) 0 - 0 ha (0 - 0 %)	>70% DRP	>70% Central West	Not Protected				
EWRHI	239: LC/4c Red Stringybark - Dwyers Red Gum - Black Cypress Pine woodland on siliceous ranges in the south-eastern Cobar Peneplain Bioregion	500 (250 - 750) ha 200 - 600 ha (27 - 240 %) 70 - 130 ha (9.3 - 52 %)	>70% CP	30-70% Lachlan 30-70% Murrumbidgee	Cocoparra NP Pucawan NR* The Rock NR*	8,364 287 343	60 20 20	12 4 4	M E2 E2

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EWRHI	257: NT/5a Dwyer's Red Gum - Currawang grassy mid-high woodland of central NSW	45,000 (32,000 - 58,000) ha 21,000 - 39,000 ha (36 - 120 %) 0 - 0 ha (0 - 0 %)	30-70% CP 30-70% NSS	30-70% Central West <30% Lachlan <30% Western	Not Protected				
EWT	071: E/4a Carbeen woodland on alluvial soils	20,000 (18,000 - 22,000) ha 4,100 - 4,900 ha (19 - 27 %) 140 - 160 ha (0.64 - 0.89 %)	<30% BBS >70% DRP	>70% Border R/Gwydir <30% Namoi	Boomi NR Boomi West NR Boronga NR	157 148 198	49 30 70	0.25 0.15 0.35	M M E1
EWT	100: LC/5a Desert Bloodwood - Mulga low woodland of the semi-arid plains	120,000 (84,000 - 150,000) ha 70,000 - 130,000 ha (47 - 150 %) 500 - 1,500 ha (0.33 - 1.8 %)	<30% CP >70% MUL	<30% Central West >70% Western	Gundabooka NP	64,282	1,000	0.83	E3
EWT	133: LC/4b Western Bloodwood - Whitewood low open woodland on Tibooburra Granite	3,000 (2,100 - 3,900) ha 1,900 - 3,300 ha (49 - 160 %) 100 - 300 ha (2.6 - 14 %)	>70% CHC	>70% Western	Sturt NP	338,232	200	6.67	E3
FWI	012: LC/4a Shallow marsh of regularly flooded depressions on floodplains mainly in the semi-arid (warm) climatic zone	25,000 (18,000 - 32,000) ha 14,000 - 26,000 ha (44 - 140 %) 520 - 1,500 ha (1.6 - 8.3 %)	>70% RIV	<30% Lachlan <30% Lower MD 30-70% Murray <30% Murrumbidgee	Billabong FR Kemendok NR Moira Lakes FR Pollack FR Sanddune Pine FR Snake Island FR Toupna Creek FR Yanga NP	334 1,063 1,441 714 60 37 79 70,581	4 20 400 80 16 1 5 500	0.02 0.08 1.6 0.32 0.06 0 0.02 2	E1 E1 E2 E1 E1 E1 E1 E3
FWI	017: V/5a Lignum shrubland of the semi-arid (warm) plains - mainly in the Riverina Bioregion	400,000 (280,000 - 520,000) ha 110,000 - 190,000 ha (21 - 68 %) 2,300 - 4,100 ha (0.44 - 1.5 %)	<30% DRP <30% MDD >70% RIV	<30% Lachlan <30% Lower MD 30-70% Murray 30-70% Murrumbidgee	Goonawarra NR Kalyarr NP Kemendok NR Morrisons Lake NR Mungo NP Oolambeyan NP Wilbertroy FR* Willandra NP Yanga NP DE9905 PA	410 14,936 1,063 319 111,842 21,839 136 18,835 70,581 663	75 700 11 20 100 493 2 1,000 670 110	0.02 0.18 0 0.01 0.03 0.12 0 0.25 0.17 0.03	E1 E2 E1 E2 E3 M E4 E3 E3 M
FWI	025: LC/4a Lignum shrubland on floodplains and depressions of the Mulga Lands, Channel Country Bioregions in the arid and semi-arid (hot) climate zones	500,000 (350,000 - 650,000) ha 280,000 - 520,000 ha (43 - 150 %) 4,200 - 7,600 ha (0.65 - 2.2 %)	30-70% CHC <30% MUL <30% SSD	>70% Western	Ledknapper NR Nocoleche NR Paroo-Darling NP Pindera Downs AA Sturt NP	30,759 71,068 176,427 11,790 338,232	1,860 500 2,000 500 1,000	0.37 0.1 0.4 0.1 0.2	E1 E3 E2 E3 E3

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FWI	053: V/4a Shallow freshwater sedge swamp on inland floodplains and depressions	150,000 (75,000 - 220,000) ha 35,000 - 100,000 ha (16 - 130 %) 1,800 - 3,200 ha (0.82 - 4.3 %)	<30% BBS 30-70% DRP <30% MUL <30% RIV <30% NSS	30-70% Border R/Gwydir 30-70% Central West <30% Lachlan <30% Murray <30% Murrumbidgee <30% Namoi <30% Western	Boomi NR Budelah NR Kirramingly NR* Macquarie Marshes NR Nocoleche NR	157 4,049 1,329 19,465 71,068	2 17 9 2,000 500	0 0.01 0.01 1.33 0.33	E3 M M E2 E2
FWI	066: CE/5c Artesian Mound Spring forbland/sedgeland/grassland mainly of the Mulga Lands Bioregion	50 (25 - 75) ha 8 - 22 ha (10 - 88 %) 4 - 7 ha (4.7 - 26 %)	>70% MUL	>70% Western	Paroo-Darling NP	176,427	5	10	E1
FWI	161: LC/3a Golden Goosefoot shrubland swamps of the arid and semi-arid (hot summer) zones	50,000 (25,000 - 75,000) ha 13,000 - 37,000 ha (17 - 150 %) 3,500 - 6,500 ha (4.7 - 26 %)	<30% BHC >70% DRP <30% MUL <30% CHC	<30% Border R/Gwydir <30% Namoi >70% Western	Sturt NP	338,232	5,000	10	E3
FWI	181: LC/3a Common Reed - Bushy Groundsel reedland/forbland of inland river systems	30,000 (15,000 - 45,000) ha 10,000 - 30,000 ha (22 - 200 %) 2,700 - 4,900 ha (6 - 33 %)	<30% CP <30% DRP <30% MUL <30% MDD <30% NSS 30-70% RIV	<30% Border R/Gwydir <30% Central West <30% Lachlan <30% Lower MD 30-70% Murray <30% Murrumbidgee <30% Namoi	Macquarie Marshes NR Yanga NP	19,465 70,581	3,800 5	12.67 0.02	E2 E3
FWI	182: LC/4a Cumbungi rushland of shallow semi-permanent water bodies of the inland river systems	40,000 (12,000 - 68,000) ha 15,000 - 45,000 ha (22 - 380 %) 200 - 600 ha (0.29 - 5 %)	<30% DRP <30% MUL <30% MDD <30% NSS 30-70% RIV	<30% Border R/Gwydir <30% Central West <30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Namoi	Macquarie Marshes NR	19,465	400	1	E2
FWI	205: CE/5b Marsh Club-rush very tall sedgeland of inland watercourses	5,000 (3,500 - 6,500) ha 320 - 380 ha (4.9 - 11 %) 0 - 0 ha (0 - 0 %)	>70% DRP	>70% Border R/Gwydir	Not Protected				
FWI	226: NT/5c Cyperus - Typha sedgeland of the arid zone climate zone	500 (250 - 750) ha 250 - 750 ha (33 - 300 %) 0 - 0 ha (0 - 0 %)	>70% SSD	>70% Western	Not Protected				

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FWI	238: NT/5a Permanent and semi-permanent freshwater lakes of the inland slopes and plains	1,000,000 (500,000 - 1,500,000) ha 200,000 - 600,000 ha (13 - 120 %) 720 - 2,100 ha (0.048 - 0.42 %)	<30% BBS >70% DRP >30% MUL <30% MDD <30% NSS 30-70% RIV <30% SSD	<30% Border R/Gwydir <30% Central West <30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Namoi <30% Western	Billabong FR Macquarie Marshes NR Moira Lakes FR Morrisons Lake NR Peacock Creek FR Pollack FR Willandra NP Yanga NP	334 19,465 1,441 319 99 714 18,835 70,581	19 300 664 180 5 6 100 150	0 0.03 0.07 0.02 0 0 0.01 0.02	E1 E3 E1 E2 E2 E1 E4 E1
FWI	240: NT/5c River Coobah tall shrubland of the floodplains in the Riverina and Murray-Darling Depression Bioregions	800 (400 - 1,200) ha 350 - 650 ha (29 - 160 %) 27 - 33 ha (2.3 - 8.3 %)	30-70% MDD 30-70% RIV	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee	Kalyarr NP	14,936	30	3.75	E4
FWI	241: NT/5b River Coobah swamp on the floodplains of the Darling Riverine Plains and Brigalow Belt South Bioregions	10,000 (7,000 - 13,000) ha 3,500 - 6,500 ha (27 - 93 %) 7 - 13 ha (0.054 - 0.19 %)	<30% BBS 30-70% DRP	30-70% Border R/Gwydir <30% Central West <30% Namoi	Macquarie Marshes NR	19,465	10	0.1	E2
FWI	247: E/4a Lignum shrubland on regularly flooded alluvial clay depressions in the Brigalow Belt South and Darling Riverine Plains Bioregions	350,000 (250,000 - 450,000) ha 91,000 - 160,000 ha (20 - 64 %) 3,600 - 6,500 ha (0.8 - 2.6 %)	<30% BBS >70% DRP	30-70% Border R/Gwydir <30% Central West <30% Namoi	Culgoa NP Gundabooka NP Macquarie Marshes NR Narran Lake NR*	24,965 64,282 19,465 21,830	21 300 50 4,700	0.01 0.09 0.01 1.34	M E3 E1 E1
FWI	271: LC/5b Spotted Fuchsia shrubland in drainage depressions on inland plains	3,000 (1,500 - 4,500) ha 1,300 - 3,700 ha (29 - 250 %) 0 - 0 ha (0 - 0 %)	<30% BHC <30% CHC <30% CP <30% DRP <30% MUL	<30% Central West <30% Lachlan >70% Western	Not Protected				
GFAPF	024: LC/4a Canegrass swamp of drainage depressions, lakes and pans of the inland plains	500,000 (250,000 - 750,000) ha 200,000 - 600,000 ha (27 - 240 %) 7,600 - 13,000 ha (1 - 5.2 %)	<30% BHC <30% CHC <30% DRP <30% MUL <30% MDD <30% RIV <30% SSD	<30% Central West <30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Namoi 30-70% Western	Kalyarr NP Mungo NP Nocoleche NR Paroo-Darling NP Pindera Downs AA Sturt NP Willandra NP AL9907 PA AL9908 PA CD9901 PA	14,936 111,842 71,068 176,427 11,790 338,232 18,835 19 22 229	430 100 500 1,600 7,000 1,000 123 5 5 2	0.09 0.02 0.1 0.32 1.4 0.2 0.02 0 0 0	E3 E3 E3 E3 E3 E3 E3 E1 E1 E1

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GFAPF	047: V/5a Swamp grassland of the Riverine Plain	50,000 (25,000 - 75,000) ha 13,000 - 37,000 ha (17 - 150 %) 81 - 99 ha (0.11 - 0.4 %)	>70% RIV	<30% Lachlan <30% Murray <30% Murrumbidgee	Oolambeyan NP	21,839	90	0.18	E4
GFAPF	050: LC/5a Couch Grass grassland on river banks and floodplains of inland river systems	50,000 (25,000 - 75,000) ha 15,000 - 45,000 ha (20 - 180 %) 45 - 55 ha (0.06 - 0.22 %)	<30% BBS 30-70% DRP <30% MUL <30% RIV	30-70% Border R/Gwydir <30% Central West <30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Namoi	Moira Lakes FR	1,441	50	0.1	E4
GFAPF	204: E/4a Water Couch marsh of frequently flooded inland watercourses	90,000 (63,000 - 110,000) ha 11,000 - 19,000 ha (10 - 30 %) 850 - 1,000 ha (0.77 - 1.6 %)	<30% BBS >70% DRP	30-70% Border R/Gwydir <30% Central West <30% Namoi	Macquarie Marshes NR	19,465	940	1.04	E3
GFAPF	242: NT/5b Rat's Tail Couch sod grassland of inland floodplains	5,000 (2,500 - 7,500) ha 1,500 - 4,500 ha (20 - 180 %) 0 - 0 ha (0 - 0 %)	30-70% DRP <30% RIV	<30% Border R/Gwydir <30% Central West <30% Lachlan <30% Lower MD <30% Murray <30% Murrumbidgee <30% Namoi	Not Protected				
GFTI	043: V/4a Mitchell Grass grassland of the semi-arid (hot) and arid zone alluvial floodplains	350,000 (180,000 - 520,000) ha 110,000 - 190,000 ha (21 - 110 %) 7,600 - 13,000 ha (1.5 - 7.2 %)	<30% BHC >70% DRP <30% MUL	<30% Border R/Gwydir <30% Central West <30% Namoi 30-70% Western	Culgoa NP Narran Lake NR* Paroo-Darling NP Paroo-Darling SCA	24,965 21,830 176,427 41,457	4,000 1,600 120 5,000	1.14 0.46 0.03 1.43	E1 E1 M E3
GFTI	044: E/5a Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	300,000 (150,000 - 450,000) ha 40,000 - 120,000 ha (8.9 - 80 %) 31 - 57 ha (0.0069 - 0.038 %)	>70% RIV	30-70% Murray 30-70% Murrumbidgee	Jerilderie NR Koonadan HS DE9905 PA	37 21 663	37 5 2	0.01 0 0	M E4 E1
GFTI	045: V/5a Plains Grass grassland on alluvial dark grey clays of central New South Wales	250,000 (130,000 - 370,000) ha 50,000 - 150,000 ha (14 - 120 %) 1,400 - 2,600 ha (0.38 - 2 %)	30-70% DRP 30-70% RIV	<30% Central West <30% Lachlan 30-70% Murray 30-70% Murrumbidgee	Oolambeyan NP	21,839	2,000	0.8	E3
GFTI	046: LC/3a Curly Windmill Grass - speargrass - wallaby grass on alluvial clay and loam on the Hay Plain, Riverina Bioregion	250,000 (130,000 - 370,000) ha 100,000 - 300,000 ha (27 - 230 %) 12,000 - 34,000 ha (3.2 - 26 %)	>70% RIV	30-70% Lachlan 30-70% Murrumbidgee	Kalyarr NP Oolambeyan NP Willandra NP DE9906 PA	14,936 21,839 18,835 43	2,050 15,600 5,445 5	0.82 6.24 2.18 0	E2 E2 E3 M

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GFTI	049: V/4a Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone	200,000 (100,000 - 300,000) ha 35,000 - 100,000 ha (12 - 100 %) 3,400 - 6,200 ha (1.1 - 6.2 %)	<30% BBS >70% DRP	>70% Border R/Gwydir <30% Central West <30% Namoi	Arakoola NR* Boronga NR Budelah NR Careunga NR* Macquarie Marshes NR Midkin NR Planchonella NR*	3,159 198 4,049 492 19,465 374 722	534 5 150 20 4,000 30 100	0.27 0 0.08 0.01 2 0.02 0.05	E2 E3 E3 E3 E2 E3 E4
GFTI	052: E/5a Queensland Bluegrass - Cup Grass - Mitchell Grass - Native Millet alluvial plains grassland	500,000 (250,000 - 750,000) ha 75,000 - 220,000 ha (10 - 88 %) 2,100 - 2,500 ha (0.28 - 1 %)	<30% BBS >70% DRP	>70% Border R/Gwydir <30% Namoi <30% Western	Budelah NR Kirramingly NR*	4,049 1,329	1,200 1,100	0.24 0.22	E3 M
GFTI	061: LC/2a Mitchell Grass - saltbush grassland/shrubland of the gibber downs of the arid climate zone	800,000 (560,000 - 1,000,000) ha 280,000 - 820,000 ha (28 - 150 %) 120,000 - 200,000 ha (12 - 36 %)	>70% CHC <30% MUL	>70% Western	Pindera Downs AA Sturt NP	11,790 338,232	2,000 157,500	0.25 19.69	E3 E3
GFTI	149: LC/3a Neverfail Grass - ephemeral herbaceous forbland of interdune claypans mainly in the arid climate zone	30,000 (15,000 - 45,000) ha 13,000 - 37,000 ha (29 - 250 %) 750 - 2,200 ha (1.7 - 15 %)	<30% CHC <30% MUL >70% SSD	>70% Western	Nocoleche NR Sturt NP	71,068 338,232	1,000 500	3.33 1.67	E3 E3
GFTI	165: LC/1a Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone	30,000 (15,000 - 45,000) ha 50,000 - 150,000 ha (110 - 1000 %) 15,000 - 27,000 ha (33 - 180 %)	<30% CP >70% MDD <30% RIV	<30% Lachlan >70% Lower MD <30% Murrumbidgee <30% Western	Kalyarr NP Mallee Cliffs NP Mungo NP Nombinnie NR Nombinnie SCA Oolambeyan NP Tarawi NR Yathong NR Nanya Ballarat Uni VCA Scotia AWC VCA VCA006 VCA	14,936 57,956 111,842 72,128 53,261 21,839 33,445 108,768 28,849 64,528 18	45 3,900 7,500 1,700 400 5 400 6,040 720 110 2	0.15 13 25 5.67 1.33 0.02 1.33 20.13 2.4 0.37 0.01	E1 E2 E2 E1 E2 E3 E1 E2 E1 E1 M
GFTI	183: LC/5b Windmill Grass - love grass - daisy derived grassland/forbland of arid climate zone	1,000 (100 - 1,900) ha 50,000 - 150,000 ha (2630 - 150000 %) 0 - 0 ha (0 - 0 %)	30-70% BHC <30% MUL	>70% Western	Not Protected				
GFTI	214: V/5a Native Millet - Cup Grass grassland of the Darling Rverine Plain Bioregion	30,000 (15,000 - 45,000) ha 7,000 - 13,000 ha (16 - 87 %) 180 - 210 ha (0.4 - 1.4 %)	>70% DRP	<30% Border R/Gwydir <30% Central West <30% Namoi	Boomi NR Boomi West NR Budelah NR	157 148 4,049	30 11 150	0.1 0.04 0.5	E4 E4 E4

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GFTI	215: LC/3a Woollybutt open grasslands on red earths of the inland plains	40,000 (20,000 - 60,000) ha 20,000 - 60,000 ha (33 - 300 %) 3,600 - 6,600 ha (6 - 33 %)	<30% CP <30% DRP <30% MUL <30% MDD	>70% Western	Nocoleche NR Paroo-Darling NP	71,068 176,427	500 4,600	1.25 11.5	E3 M
GFTI	250: LC/2b Derived tussock grasslands of the central western plains and lower slopes of NSW	1,000 (100 - 1,900) ha 200,000 - 600,000 ha (10530 - 600000 %) 440 - 530 ha (23 - 530 %)	<30% CP 30-70% NSS	30-70% Central West 30-70% Lachlan <30% Murrumbidgee	CD9907 PA CD9911 PA VCA008 VCA*	343 410 400	122 260 100	12.2 26 10	M M M
HGI	117: LC/4a Buck Spinifex hummock grassland - Silver-leaved Ironbark open woodland on deep sand	60,000 (54,000 - 66,000) ha 52,000 - 62,000 ha (79 - 110 %) 2,000 - 2,300 ha (3 - 4.3 %)	<30% DRP 30-70% MUL	>70% Western	Ledknapper NR Narran Lake NR*	30,759 21,830	1,065 1,079	1.78 1.8	M M
HGI	151: NT/5c Sandhill Cane Grass hummock grassland on siliceous sands on dune crests of the arid zone	800 (400 - 1,200) ha 300 - 900 ha (25 - 230 %) 51 - 93 ha (4.3 - 23 %)	<30% DRP <30% MDD 30-70% SSD	30-70% Lower MD <30% Western	Kinchega NP	44,441	72	9	M
HGI	235: NT/5b Yetman Buloke - Inland Grey Box - spinifex woodland on alkaline, sandy outwash plains mainly in the BBS Bioregion	2,000 (1,400 - 2,600) ha 1,100 - 1,900 ha (42 - 140 %) 0 - 0 ha (0 - 0 %)	30-70% BBS 30-70% DRP	>70% Border R/Gwydir	Not Protected				
MWSI	170: NT/4a Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	1,100,000 (770,000 - 1,400,000) ha 530,000 - 970,000 ha (38 - 130 %) 34,000 - 62,000 ha (2.4 - 8.1 %)	>70% CHC <30% DRP 30-70% MDD	<30% Lachlan 30-70% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Kajuligah NR Mallee Cliffs NP Mungo NP Tarawi NR Yanga NP Nanya Ballarat Uni VCA Scotia AWC VCA	13,826 57,956 111,842 33,445 70,581 28,849 64,528	2,000 14,100 5,000 9,000 500 1,500 16,000	0.18 1.28 0.45 0.82 0.05 0.14 1.45	E3 E1 E2 E1 E3 E3 E3
MWSI	171: LC/3a Spinifex linear dune mallee mainly of the Murray-Darling Depression Bioregion	800,000 (560,000 - 1,000,000) ha 460,000 - 840,000 ha (46 - 150 %) 73,000 - 130,000 ha (7.3 - 23 %)	>70% MDD	<30% Lachlan >70% Lower MD <30% Western	Mallee Cliffs NP Mungo NP Nombinnie NR Nombinnie SCA Round Hill NR Tarawi NR Yathong NR Nanya Ballarat Uni VCA Scotia AWC VCA	57,956 111,842 72,128 53,261 13,642 33,445 108,768 28,849 64,528	17,300 6,000 250 200 143 9,000 34,000 10,530 26,150	2.16 0.75 0.03 0.03 0.02 1.13 4.25 1.32 3.27	E2 E2 E1 E1 M E1 E2 E1 E1
MWSI	172: LC/3a Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	364,000 (330,000 - 400,000) ha 330,000 - 390,000 ha (83 - 120 %) 38,000 - 46,000 ha (9.5 - 14 %)	>70% MDD	>70% Lower MD	Mallee Cliffs NP Mungo NP	57,956 111,842	4,500 37,500	1.24 10.3	E1 E2

Formation Group Acronym	Veg ID: Threat/Protected Area Code Plant Community Common Name	ESTIMATED EXTENT: pre-European (range) Current Range (% pre-European) Protected Range (% pre-European)	% of Community in Bioregion	% of Community in CMA	Protected Area Name and Size (ha) (* = also on Western Slopes)		Veg Area (ha) % of Pre-European & Accuracy Code		
MWSI	173: NT/2a Sandplain mallee of central NSW	700,000 (490,000 - 910,000) ha 250,000 - 450,000 ha (27 - 92 %) 120,000 - 130,000 ha (13 - 27 %)	<30% CP 30-70% MDD <30% NSS	<30% Central West 30-70% Lachlan <30% Murrumbidgee	Gubbata NR Kajuligah NR Langtree NR Loughnan NR Mount Grenfell HS Nombinnie NR Nombinnie SCA Pulletop NR Round Hill NR Scrubby Mountain FR Yathong NR WE9906 PA* WE9907 PA*	151 13,826 232 390 1,365 72,128 53,261 145 13,642 1,704 108,768 24 35	146 4,000 32 360 100 57,590 33,830 135 12,540 250 13,400 24 35	0.02 0.57 0 0.05 0.01 8.23 4.83 0.02 1.79 0.04 1.91 0 0.01	E1 E3 E1 E1 E2 E1 E2 E1 E1 E3 E2 M M
MWSI	174: V/3a Mallee - Smooth-barked Coolabah woodland on red earth flats of the eastern Cobar Peneplain Bioregion	80,000 (56,000 - 100,000) ha 25,000 - 45,000 ha (25 - 80 %) 7,700 - 14,000 ha (7.7 - 25 %)	>70% CP	<30% Central West <30% Lachlan 30-70% Western	Quanda NR Tollingo NR Woggoon NR	4,767 3,247 6,113	2,200 3,180 5,500	2.75 3.98 6.88	E1 M E1
MWSI	190: NT/3c Mallee Box open woodland	300 (210 - 390) ha 170 - 310 ha (44 - 150 %) 73 - 130 ha (19 - 62 %)	>70% MDD	<30% Lachlan >70% Lower MD	Tarawi NR Tollingo NR Woggoon NR	33,445 3,247 6,113	100 2 1	33.33 0.67 0.33	E2 E2 E4
MWSI	191: LC/1b Snap and Rattle Mallee - Moonah open mallee shrubland	7,000 (3,500 - 10,000) ha 3,300 - 9,700 ha (33 - 280 %) 3,200 - 5,900 ha (32 - 170 %)	>70% MDD	>70% Lower MD	Tarawi NR Nanya Ballarat Uni VCA Scotia AWC VCA	33,445 28,849 64,528	2,000 560 2,000	28.57 8 28.57	E2 E3 E3
MWSI	193: E/3a Tall bull mallee woodland on clayey soils of central NSW	20,000 (10,000 - 30,000) ha 2,500 - 7,500 ha (8.3 - 75 %) 1,100 - 1,900 ha (3.7 - 19 %)	<30% CP 30-70% MDD	<30% Central West 30-70% Lachlan	Nombinnie NR Nombinnie SCA Quanda NR	72,128 53,261 4,767	500 1,000 10	2.5 5 0.05	E1 E1 E4
MWSR	169: LC/5b Curly Mallee - bluebush open woodland of the arid zone	1,400 (980 - 1,800) ha 910 - 1,600 ha (51 - 160 %) 0 - 0 ha (0 - 0 %)	>70% BHC	>70% Western	Not Protected				
MWSR	175: NT/5a Ridge mallee woodland on hills of meta-sediments and volcanics, eastern Cobar Peneplain Bioregion	60,000 (42,000 - 78,000) ha 32,000 - 58,000 ha (41 - 140 %) 0 - 0 ha (0 - 0 %)	>70% CP	30-70% Central West <30% Lachlan <30% Western	Not Protected				
MWSR	176: LC/3a Green Mallee - White Cypress Pine woodland on gravelly rises of central NSW	75,000 (53,000 - 97,000) ha 42,000 - 78,000 ha (43 - 150 %) 5,000 - 9,200 ha (5.2 - 17 %)	>70% CP <30% MDD <30% NSS	30-70% Central West <30% Lachlan 30-70% Western	Nombinnie SCA Yathong NR CD9907 PA CD9911 PA WE9902 PA*	53,261 108,768 343 410 57	260 6,800 2 21 40	0.35 9.07 0 0.03 0.05	M E2 M M E1

Formation Group Acronym	Veg ID: Threat/Protected Area Code Plant Community Common Name	ESTIMATED EXTENT: pre-European (range) Current Range (% pre-European) Protected Range (% pre-European)	% of Community in Bioregion	% of Community in CMA	Protected Area Name and Size (ha) (* = also on Western Slopes)		Veg Area (ha) % of Pre-European & Accuracy Code		
MWSR	180: LC/3a Grey Mallee - White Cypress Pine woodland on rocky hills of the eastern Cobar Peneplain Bioregion	35,000 (25,000 - 45,000) ha 24,000 - 42,000 ha (53 - 170 %) 3,200 - 3,800 ha (7.1 - 15 %)	>70% CP	30-70% Central West <30% Lachlan <30% Western	Nombinnie NR Round Hill NR Scrubby Mountain FR Yathong NR	72,128 13,642 1,704 108,768	23 200 50 3,250	0.07 0.57 0.14 9.29	M E3 E3 E1
MWSR	218: LC/3a Grey Mallee - Mulga shrubland of the north-western Cobar Peneplain Bioregion	33,000 (30,000 - 36,000) ha 28,000 - 34,000 ha (78 - 110 %) 1,300 - 2,300 ha (3.6 - 7.7 %)	>70% CP	>70% Western	Gundabooka NP Mount Grenfell HS	64,282 1,365	1,500 310	4.55 0.94	E2 E2
MWSR	256: LC/5b Green Mallee - Black Cypress Pine tall mallee woodland on rises in central NSW	10,000 (5,000 - 15,000) ha 4,300 - 12,000 ha (29 - 240 %) 45 - 55 ha (0.3 - 1.1 %)	<30% BBS 30-70% CP 30-70% NSS	>70% Central West <30% Lachlan	Coolbaggie NR*	1,773	50	0.5	E2
RDGI	137: NT/3a Whitewood - Western Rosewood low woodland on sandplains and dunes of the semi-arid (hot) and arid climatic zones	40,000 (20,000 - 60,000) ha 13,000 - 37,000 ha (22 - 190 %) 1,500 - 2,700 ha (2.5 - 14 %)	<30% CHC <30% DRP <30% MUL <30% SSD	>70% Western	Ledknapper NR Nocoleche NR Sturt NP	30,759 71,068 338,232	500 1,500 100	1.25 3.75 0.25	E2 E3 E3
RDGI	144: NT/4a Leopardwood woodland of alluvial plains	350,000 (180,000 - 520,000) ha 100,000 - 300,000 ha (19 - 170 %) 3,400 - 10,000 ha (0.65 - 5.6 %)	<30% BBS <30% CP 30-70% DRP 30-70% MUL	<30% Border R/Gwydir <30% Central West <30% Namoi <30% Western	Gundabooka NP Narran Lake NR* Nocoleche NR Paroo-Darling NP	64,282 21,830 71,068 176,427	1,000 171 2,000 3,500	0.29 0.05 0.57 1	E2 E2 E3 E2
RDGI	145: E/5a Wilga - Western Rosewood shrubland of the tropical sub-humid climate zone Brigalow Belt South and Darling Riverine Plains Bioregions	150,000 (75,000 - 220,000) ha 20,000 - 60,000 ha (9.1 - 80 %) 10 - 30 ha (0.0045 - 0.04 %)	30-70% BBS 30-70% DRP	<30% Border R/Gwydir <30% Central West <30% Namoi	Planchonella NR*	722	20	0.01	M
RDGI	146: E/5b Whitewood open woodland of the subtropical sub-humid plains (BBS and eastern DRP Bioregions).	10,000 (5,000 - 15,000) ha 1,000 - 3,000 ha (6.7 - 60 %) 5 - 15 ha (0.033 - 0.3 %)	30-70% DRP	<30% Border R/Gwydir <30% Central West <30% Namoi	Midkin NR	374	10	0.1	E1
RDGI	264: NT/4a Supplejack woodland of the semi-arid plains	35,000 (18,000 - 52,000) ha 15,000 - 45,000 ha (29 - 250 %) 380 - 700 ha (0.73 - 3.9 %)	<30% DRP 30-70% MUL	>70% Western	Gundabooka NP Ledknapper NR	64,282 30,759	500 40	1.43 0.11	E2 E2
SWISL	018: NT/5a Slender Glasswort low shrubland in saline depressions in the semi-arid and arid climate zones	200,000 (140,000 - 260,000) ha 84,000 - 150,000 ha (32 - 110 %) 1,300 - 1,400 ha (0.5 - 1 %)	<30% MUL <30% MDD 30-70% RIV	<30% Lachlan >70% Lower MD <30% Murray <30% Murrumbidgee <30% Western	Kalyarr NP	14,936	1,350	0.68	E3
SWISL	062: LC/4a Samphire - Small Hogweed saline forbland of lake margins in the arid and semi-arid (hot) zones	50,000 (35,000 - 65,000) ha 32,000 - 58,000 ha (49 - 170 %) 1,700 - 3,000 ha (2.6 - 8.6 %)	<30% DRP 30-70% MUL <30% SSD	>70% Western	Narran Lake NR* Paroo-Darling NP Sturt NP	21,830 176,427 338,232	30 300 2,000	0.06 0.6 4	E1 E3 E3

Formation Group Acronym	Veg ID: Threat/Protected Area Code Plant Community Common Name	ESTIMATED EXTENT: pre-European (range) Current Range (% pre-European) Protected Range (% pre-European)	% of Community in Bioregion	% of Community in CMA	Protected Area Name and Size (ha) (* = also on Western Slopes)		Veg Area (ha) % of Pre-European & Accuracy Code		
SWISL	063: NT/5b Spiny Lignum - Slender Glasswort open forbland on lake edges in the semi-arid and arid climate zones	5,000 (2,500 - 7,500) ha 2,300 - 6,700 ha (31 - 270 %) 140 - 260 ha (1.9 - 10 %)	<30% DRP 30-70% MDD <30% RIV	>70% Lower MD <30% Murray	Nearie Lake NR	4,354	200	4	E2
SWISL	064: LC/4b Samphire - Water Weed - Sea-Heath shrubland of saline depressions of the arid and semi-arid (warm) zones	10,000 (5,000 - 15,000) ha 5,000 - 15,000 ha (33 - 300 %) 740 - 890 ha (4.9 - 18 %)	30-70% DRP 30-70% MDD	>70% Lower MD	Tarawi NR Nanya Ballarat Uni VCA Scotia AWC VCA	33,445 28,849 64,528	1 800 11	0.01 8 0.11	E1 E2 E1
SWISL	065: V/1c Halosarcia lylei low, open shrubland of arid and semi-arid regions	50 (35 - 65) ha 35 - 65 ha (54 - 190 %) 32 - 58 ha (49 - 170 %)	>70% MDD	>70% Lower MD	Nanya Ballarat Uni VCA	28,849	45	90	E2
SWISL	162: LC/5b Sturts Pigface sparse forbland of saline soils of the arid zone	3,000 (900 - 5,100) ha 900 - 5,100 ha (18 - 570 %) 10 - 190 ha (0.2 - 21 %)	30-70% CHC 30-70% SSD	>70% Western	Sturt NP	338,232	100	3.33	E3
SWISL	189: NT/3a Ephemeral forbland of low-saline lake-beds of the arid and semi-arid (warm) climate zones	40,000 (20,000 - 60,000) ha 10,000 - 30,000 ha (17 - 150 %) 1,600 - 2,800 ha (2.7 - 14 %)	30-70% DRP 30-70% MDD	>70% Lower MD <30% Western	Kinchega NP Nearie Lake NR	44,441 4,354	417 1,737	1.04 4.34	M E2
SWISL	198: LC/3a Sparse saltbush forbland of the irregularly inundated lakes of the arid and semi-arid (persistently hot) climate zones	45,000 (23,000 - 67,000) ha 18,000 - 52,000 ha (27 - 230 %) 4,200 - 7,800 ha (6.3 - 34 %)	<30% BHC 30-70% CHC 30-70% MUL	>70% Western	Paroo-Darling NP	176,427	6,000	13.33	M
SWISL	212: LC/5a Ephemeral forbland on playas and scalds in the Darling Riverine Plain Bioregion	50,000 (25,000 - 75,000) ha 50,000 - 150,000 ha (67 - 600 %) 1,000 - 1,800 ha (1.3 - 7.2 %)	<30% CP >70% DRP	30-70% Central West <30% Namoi 30-70% Western	Culgoa NP Narran Lake NR*	24,965 21,830	350 1,070	0.7 2.14	E2 E1
SWISL	253: V/5b Gypseous shrubland on rises in the semi-arid and arid plains	2,000 (1,000 - 3,000) ha 700 - 2,100 ha (23 - 210 %) 0 - 0 ha (0 - 0 %)	>70% MDD	>70% Lower MD	Not Protected				
SWISL	262: LC/5b Submerged flora of saline temporary wetlands of arid zone	9,000 (4,500 - 13,000) ha 4,500 - 13,000 ha (35 - 290 %) 0 - 0 ha (0 - 0 %)	30-70% SSD	>70% Western	Not Protected				
SWISL	263: LC/5b Submerged flora of saline permanent wetlands of the arid zone	10,000 (5,000 - 15,000) ha 5,000 - 15,000 ha (33 - 300 %) 0 - 0 ha (0 - 0 %)	30-70% MUL 30-70% SSD	>70% Western	Not Protected				

Plant communities

A total of 213 plant communities are classified and assessed for the NSW Western Plains. Query reports in the NSWVCA database (described in Benson 2006) list plant communities for bioregions, bioregion sub-regions, CMA areas, Local Government Areas, conservation reserves, secure property agreements, Formation Groups, NSW Vegetation Classes (Keith 2004), the major Australian vegetation sub-groups in the National Vegetation Information System (NLWRA 2001, ESCAVI 2003) and communities selected using the 'search' mode of the database (eg all communities with *Eucalyptus camaldulensis* (River Red Gum) in the 'scientific name' field). These reports are available in full format (90 fields of information) or short format (28 fields) and can be generated from the copy of the NSWVCA database on the CD in the back pocket of this journal. The search routine in the database can be used to select communities by ID number, common name, scientific name, Formation Group, Bioregion, sub-region, CMA area, Botanical Division and Local Government Area.

An All Records Full Report from the NSWVCA database of the 213 Western Plains plant communities is presented in Appendix A in Folder 3 on the CD accompanying this paper. This includes all information recorded in the database for each community and up to three low resolution photographs.

Table 4. Cross reference of 213 plant communities classified in the NSW Western Plains with 19 Formation Groups classified in the NSWVCA for that section of NSW.

Formation Group	Acronym	NWVCA Veg. ID Numbers	No.
Acacia Woodlands and Shrublands of the Inland Slopes and Plains	ASAZ	23, 26, 27, 29, 31, 35, 77, 118, 119, 120, 121, 123, 124, 125, 127, 128, 129, 130, 131, 132, 134, 136, 139, 199, 220	25
Casuarina Communities of the Inland Slopes and Plains	CCI	20, 22, 54, 55, 57, 58, 59, 60, 221, 228, 254	11
Chenopod (Halophytic) Shrublands of the Inland	CHS	152, 153, 154, 155, 156, 157, 158, 159, 160, 163, 164, 166, 168, 195, 196, 210, 211, 216, 222, 224, 225, 236	22
Cypress Pine (*Callitris*) woodlands mainly of the Inland	CPW	19, 21, 28, 48, 68, 69, 70, 72, 106, 245, 246	11
Ephemeral Grasslands in Semi-arid and Arid Regions	EGA	150, 167	2
Eremophila, *Melaleuca* and *Dodonaea* Shrublands of the Inland	EMDI	115, 138, 140, 142, 143, 194, 213, 229, 232, 252, 261, 271	12
Eucalyptus Box Woodlands of the Inland Plains	EBWP	56, 75, 76, 80, 82, 83, 86, 87, 88, 98, 103, 104, 105, 108, 109, 110, 122, 201, 207, 244, 248, 258	22
Eucalyptus Communities of Inland Watercourses and Inner Floodplains	EIW	2, 5, 7, 8, 9, 10, 11, 13, 15, 16, 36, 37, 38, 39, 40, 41, 67, 74, 197, 200, 206, 208, 230, 231, 233, 234, 237, 249, 251	29
Eucalyptus Corymbia Communities of the Tropics	EWT	71, 100, 133	3
Eucalyptus Ironbark Woodlands and Forests of the Inland Plains and Peneplains	EIWI	192, 217, 227, 243	4
Eucalyptus Woodlands on Rocky Hills of the Inland	EWRHI	184, 185, 186, 188, 239, 257	6
Freshwater Wetlands: Inland Freshwater Aquatic, Swamp and Shrubland Communities	FWI	12, 17, 25, 53, 66, 161, 181, 182, 205, 226, 238, 240, 241, 247	14
Grasslands of Freshwater Aquatic Habitats or Periodically Flooded Soils	GFAPF	24, 47, 50, 204, 242	5
Grasslands on Fine Texture Soils on the Inland Slopes and Plains	GTP	43, 44, 45, 46, 49, 52, 61, 149, 165, 183, 214, 215, 250	13
Hummock Grasslands and Woodlands of the Inland Plains and Peneplains	HGI	117, 151, 235	3
Mallee Woodlands and Shrublands of Inland Sandplains and Sand Dunes	MWSI	170, 171, 172, 173, 174, 190, 191, 193	8
Mallee Woodlands and Shrublands of Inland Stony Ridges	MWSR	169, 175, 176, 180, 218, 256	6
Rainforest-derived Genera Woodlands and Shrublands of the Inland Slopes and Plains	RDGI	137, 144, 145, 146, 264	5
Saline Wetlands: Saline and Clay Lakes (Playas) of the Inland	SWISL	18, 62, 63, 64, 65, 162, 189, 198, 212, 253, 262, 263	12

The communities are also listed under the 19 higher hierarchy Formation Groups that occur in western NSW.

An All Records Short Report from the database is presented in Appendix B in Folder 3 on the CD. This lists all the plant communities in one file in order of the Formation Group names. The 28 fields in the short report include characteristic species and the vegetation description but exclude most of the physiographic and location data fields.

The common name, estimated extents and distribution of each plant community is summarised in Table 3 that forms the main meta-analysis of the vegetation classification and assessment. Table 3 lists all communities in order of 19 Formation Groups recording their ID number, threat/ protected area code and common name; estimated pre-European, current, and protected area extents with confidence ranges; proportion in bioregions and CMAs; and extent in each protected area with an accuracy code.

Table 5. Cross reference of the 213 plant communities classified in the NSW Western Plains in the NSWVCA database with the 32 Vegetation Classes mapped in Keith (2004) that occur wholly of partly in the NSW Western Plains.
* indicates Vegetation Classes in Keith (2004) that predominantly occur outside the NSW Western Plains and therefore are incompletely classified at this point in NSWVCA.

Vegetation Class (Keith 2004)	NSWVCA Veg. ID Numbers	Total
Aeolian Chenopod Shrublands	152, 153, 154, 222	4
Brigalow Clay Plain Woodlands	29, 31, 35, 55, 145	5
Desert Woodlands	100, 133	2
Dune Mallee Woodlands	171, 172, 191	3
Floodplains Transition Woodlands	56, 74, 76, 80, 82, 237, 248, 251	8
Gibber Chenopod Shrublands	61, 136, 150, 155, 156, 167, 183, 210, 224	9
Gibber Transition Shrublands	118, 131, 197	3
Inland Floodplain Shrublands	17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271	11
Inland Floodplain Swamps	12, 47, 53, 66, 181, 182, 204, 205, 225, 226, 238	11
Inland Floodplain Woodlands	13, 15, 16, 83, 207,	5
Inland Riverine Forests	2, 5, 7, 8, 9, 10, 11, 36, 208, 233, 234, 249	12
Inland Rocky Hill Woodlands	104, 106, 122, 175, 176, 180, 184, 185, 188, 218, 239, 256, 257, 258	14
Inland Saline Lakes	18, 62, 63, 64, 65, 149, 162, 166, 189, 198, 253, 262, 263	13
North-west Alluvial Sand Woodlands	71, 137, 192, 206, 227	5
North-west Floodplain Woodlands	37, 38, 39, 40, 41, 67, 87, 200, 230, 231	10
North-west Plain Shrublands	77, 125, 144, 213, 229, 264	6
North-west Slopes Dry Sclerophyll Woodlands*	70, 228	2
Pilliga Outwash Dry Sclerophyll Forests*	88, 235	2
Riverine Chenopod Shrublands	157, 158, 159, 163, 164, 168, 195, 196, 211, 212, 216, 236, 254,	13
Riverine Plain Grasslands	44, 45, 46, 165	4
Riverine Plain Woodlands	26, 27	2
Riverine Sandhill Woodlands	19, 20, 21, 22, 23, 28, 48, 75, 86	9
Sand Plain Mallee Woodlands	142, 170, 173, 174, 190, 193	6
Sand Plain Mulga Shrublands	69, 119, 124, 128, 129, 139, 140, 143, 151, 199, 215, 220, 232	13
Semi-arid Floodplain Grasslands	43, 49, 50, 52, 214, 242	6
Semi-arid Sand Plain Woodlands	57, 58, 59, 221, 252	5
Stony Desert Mulga Shrublands	60, 68, 120, 121, 123, 127, 130, 132, 138, 169, 194	11
Subtropical Semi-arid Woodlands	117, 146	2
Western Peneplain Woodlands	72, 98, 103, 105, 134, 108, 109, 244, 245, 246	10
Western Slopes Grasslands*	250	1
Western Slopes Grassy Woodlands*	201	1
Western Slopes Dry Sclerophyll Forests*	54, 110, 186, 217, 243,	5

Table 6. Cross reference of 213 NSWVCA communities with the 32 major sub-groups (version 3, 2005) of the National Vegetation Information System (ESCAVI 2003) that occur in the Western Plains of NSW.
Note: as NSWVCA progresses to eastern areas of NSW additional plant communities will be assigned to some of these NVIS sub-groups and to other sub-groups not listed here.

NVIS Major Sub-group V3, 2005	NSWVCA Veg. IDs	Total
Allocasuarina woodland and open woodland with hummock grass	235	1
Arid and semi-arid Acacia low open woodlands and shrublands with chenopods	127, 139, 220	3
Arid and semi-arid Acacia low open woodlands and shrublands with tussock grass	124, 128, 129, 130, 131, 134, 136	7
Arid and semi-arid hummock grasslands	117, 151	2
Blue grass (Dicanthium) and tall bunch grass (Chrysopogon) tussock grasslands	52	1
Brigalow (Acacia harpophylla) forests and woodlands	29, 31, 35	3
Callitris forests and woodlands	19, 21, 28, 48, 68, 69, 70, 72, 106, 245, 246	11
Casuarina and Allocasuarina forests and woodlands	20, 22, 54, 55, 57, 58, 59, 60, 221, 228, 254	11
Chenopod shrublands	152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 163, 164, 168, 195, 196, 201, 211, 216, 222, 224, 225, 236	22
Eucalyptus forests with a grassy understorey	2, 5, 7, 36	4
Eucalyptus forests with a shrubby understorey	11	1
Eucalyptus low open woodlands with a chenopod or samphire understorey	169, 197	2
Eucalyptus low open woodlands with a grassy understorey	16, 37, 40, 207	4
Eucalyptus low open woodlands with a shrubby understorey	38, 100, 133	3
Eucalyptus open woodlands with a shrubby understorey;	109, 122	2
Eucalyptus woodlands with a grassy understorey	8, 9, 56, 74, 75, 76, 83, 86, 87, 88, 105, 108, 188, 192, 227, 230, 233, 237, 244, 248, 249, 251, 257	23
Eucalyptus woodlands with a shrubby understorey	10, 13, 15, 39, 41, 67, 71, 80, 82, 98, 103, 104, 110, 184, 185, 186, 200, 206, 208, 217, 231, 234, 239, 243, 258	25
Freshwater dams, lakes, lagoons and aquatic plants	238	1
Mallee Eucalyptus low open woodlands	170, 173, 174, 175, 176, 180, 190, 193, 218, 256	10
Mallee heath and shrublands	171, 172, 191	3
Melaleuca open forests and woodlands	138, 140, 142, 261	4
Mitchell grass (Astrebla) tussock grasslands	43, 61	2
Mixed chenopod, samphire and forblands	18, 62, 63, 64, 65, 162, 198	7
Mulga (Acacia aneura) woodlands and tall shrublands with tussock grass	119, 120, 123, 125, 132	5
Naturally bare sand, rock, claypan	24, 166, 189, 212, 253	5
Other Acacia forests and woodlands	26, 27, 118	3
Other Acacia open shrublands and shrublands	23, 77, 240, 241	4
Other low open woodlands and shrublands with tussock grass	121, 137, 144, 146, 152, 264	6
Other shrublands	17, 25, 115, 143, 145, 194, 199, 210, 213, 229, 232, 247, 271	13
Other tussock grasslands	44, 45, 46, 47, 49, 149, 150, 165, 167, 183, 214, 215, 250	13
Salt lakes and lagoons	262, 263	2
Wet tussock grassland, herbland, sedgeland and rushland	12, 50, 53, 66, 181, 182, 204, 205, 226, 242	10

An example of a Full Report database record of plant communities is in Appendix D. An example of a Short Report database record is in Appendix E. Some of the plant communities are shown in Figures 9–36.

Range of plant communities

The plant communities vary greatly in their species heterogeneity, species richness, extent, range and condition. In summary, they comprise of tussock grasslands occurring on fine grained soils; hummock grasslands on sandier soils; chenopod shrublands on loams and clays; samphire shrublands in saline depressions; dry lake forblands; *Acacia* woodlands on clayey soils including: *Acacia pendula* (Weeping Myall), *Acacia harpophylla* (Brigalow) and *Acacia cambagei* (Gidgee) woodlands; *Acacia* shrublands and low woodlands on sandplains or washouts including those dominated by: Mulga (*Acacia aneura* sens lat.), *Acacia excelsa* (Ironwood), *Acacia cana* (Cabbage-tree Wattle) and Gidgee; *Acacia* shrublands on rocky outcrops dominated by *Acacia aneura* sens lat. (Mulga), *Acacia tetragonophylla* (Dead Finish) and *Acacia brachystachya* (Umbrella Mulga); riparian forests and floodplain depression woodlands dominated by *Eucalyptus camaldulensis* (River Red Gum), *Eucalyptus largiflorens* (Black Box) and *Eucalyptus coolabah* (Coolabah); *Eucalyptus* box woodlands on alluvial plains including those dominated by *Eucalyptus populnea* (Poplar Box), *Eucalyptus microcarpa* (Inland Grey Box) and *Eucalyptus melliodora* (Yellow Box); low open woodlands dominated by *Alectryon oleifolius* (Western Rosewood) and Belah/Black Oak (*Casuarina cristata* and *C. pauper*); shrublands dominated by species of *Hakea*, *Dodonaea, Melaleuca* or *Eremophila*; mallee (*Eucalyptus* spp.) shrublands and woodlands on sand dunes and sand plains; hill mallee woodlands on outcropping substrates; *Callitris* (cypress pine) dominated woodlands on rocky hills, alluvial plains and sand dunes; a range of wetland types are dominated by structurally distinct species including trees, shrubs, sedges, rushes, grasses and forbs. Some plant communities are restricted to small areas due to physiographic factors such as unusual geological formations or soil types (e.g. ID132 Mulga — Rock Fuchsia on Silcrete scarps). Others span vast areas on widespread landforms and soils (e.g. ID119 Sandplain Mulga).

Table 7. Plant communities in the eight IBRA Bioregions (Version 6) that comprise the Western Plains Section of New South Wales. Note: Many communities occur in more than one bioregion.

IBRA Region & No. Communities	ID Numbers of Plant Communities
Broken Hill Complex 37	24; 38; 41; 43; 59; 60; 68; 69; 119; 120; 123; 124; 127; 128; 129; 130; 136; 138; 143; 150; 153; 154; 155; 156; 160; 161; 167; 169; 183; 198; 207; 220; 221; 222; 224; 234, 271
Channel Country 32	24; 25; 38; 41; 61; 69; 119; 123; 124; 127; 131; 132; 133; 137; 138; 149; 153; 156; 158; 160; 161; 162; 167; 170; 198; 199; 200; 207; 210; 230; 234, 271
Cobar Peneplain 66	11; 13; 23; 26; 29; 37; 55; 56; 57; 58; 59; 69; 70; 72; 77; 82; 100; 103; 104; 105; 106; 108; 109; 110; 119; 123; 125; 130; 134; 138; 139; 142; 144; 153; 154; 158; 165; 173; 174; 175; 176; 180; 181; 184; 185; 186; 193; 201; 207; 208; 212; 215; 218; 229; 233; 239; 243; 245; 246; 248; 250; 251; 256; 257; 258, 271
Darling Riverine Plains 88	8; 13; 15; 16; 17; 24; 27; 35; 36; 37; 39; 40; 43; 45; 49; 50; 52; 53; 54; 55; 56; 59; 62; 63; 64; 69; 70; 71; 77; 83; 87; 88; 98; 109; 115; 117; 118; 119; 124; 128; 130; 134; 137; 139; 143; 144; 145; 146; 151; 152; 153; 154; 157; 158; 159; 160; 161; 166; 168; 170; 181; 182; 188; 189; 192; 195; 197; 199; 204; 205; 206; 211; 212; 213; 214; 215; 220; 227; 228; 235; 238; 241; 242; 244; 247; 249, 264, 271
Mulga Lands 69	18; 24; 25; 29; 31; 36; 37; 38; 39; 40; 41; 43; 50; 53; 59; 60; 61; 62; 66; 67; 68; 69; 98; 100; 104; 109; 117; 118; 119; 120; 121; 122; 123; 127; 129; 134; 137; 139; 143; 144; 149; 150; 153; 154; 155; 156; 157; 158; 161; 166; 167; 181; 182; 183; 192; 194; 195; 197; 198; 199; 200; 207; 215; 234; 238; 261; 263, 264, 271
Murray-Darling Depression 71	10; 11; 15; 16; 17; 18; 21; 22; 23; 24; 28; 38; 57; 58; 63; 64; 65; 70; 82; 103; 104; 105; 106; 108; 119; 125; 128; 130; 134; 139; 142; 143; 150; 151; 152; 153; 154; 156; 157; 159; 160; 163; 164; 165; 166; 170; 171; 172; 173; 176; 181; 182; 184; 189; 190; 191; 193; 196; 199; 207; 215; 216; 220; 221; 238; 240; 245; 246; 252; 253; 254
Riverina 56	2; 5; 7; 8; 9; 10; 11; 12; 13; 15; 16; 17; 18; 19; 20; 21; 23; 24; 26; 28; 44; 45; 46; 47; 48; 50; 53; 58; 63; 74; 75; 76; 80; 86; 152; 153; 154; 157; 159; 160; 163; 164; 165; 166; 181; 182; 216; 217; 236; 237; 238; 240; 242; 243; 249
Simpson-Strzelecki Dunefields 25	24; 25; 38; 41; 62; 69; 119; 120; 124; 131; 137; 140; 149; 151; 155; 156; 162; 163; 225; 226; 231; 232; 238; 262; 263

While floristic variation is the main consideration in the classification, landform or geomorphology is used as a determinant in some cases. For example, the plant community ID66 covers all the mound springs of the inland plains, even though there is considerable variation in their floristic composition (Pickard 1992).

Most plant communities (160) are considered to have been 'originally common' before European settlement with an extent greater than 10 000 ha, 39 are estimated to have been restricted to 1000–10 000 ha and 17 are estimated to have been rare with less than 1000 ha prior to European settlement (Table 2).

Based on floristic, structural and geographical information, the Western Plains plant communities have been cross-referenced to three broad scale classifications of vegetation:

- Table 4 shows the plant communities distributed between the 19 Formation Groups used as a higher order hierarchy in the NSWVCA. A mean of about 12 (S.D. 8) communities are listed under each Formation Group;
- Table 5 lists the plant communities grouped under 32 Vegetation Classes from the NSW State Compilation Vegetation Map of Keith (2004). (Including Vegetation Classes that predominantly occur in the NSW Western Slopes) A mean of about 7 (S.D. 4) communities are listed under each vegetation class;

Table 8. Plant communities in NSW Catchment Management Authority areas in the NSW Western Plains.
Notes: the Western Plains Section of NSW covers all of the Western and Lower Murray/Darling CMAs and the western parts of BorderRivers/Gwydir, Namoi, Central West, Lachlan, Murrumbidgee and Murray CMAs. Many communities occur in more than one CMA.

CMA & No. Communities	ID Number of Plant Communities
Border Rivers/Gwydir 42	27; 35; 36; 37; 39; 40; 43; 49; 50; 52; 53; 55; 56; 70; 71; 87; 88; 98; 115; 144; 145; 146; 158; 161; 168; 181; 182; 192; 195; 204; 205; 206; 211; 214; 227; 228; 235; 238; 241; 242; 244;
Central West 74	24; 26; 27; 35; 36; 37; 39; 40; 43; 45; 49; 50; 53; 54; 55; 56; 57; 70; 77; 82; 83; 87; 88; 98; 100; 103; 104; 105; 106; 108; 109; 118; 125; 134; 141; 144; 145; 146; 153; 157; 158; 168; 173; 174; 175; 176; 180; 181; 182; 184; 188; 193; 195; 201; 204; 206; 208; 211; 212; 214; 217; 227; 228; 238; 241; 242; 244; 247; 248; 249; 250; 256; 257; 258, 271
Lachlan 81	7; 10; 11; 12; 13; 15; 16; 17; 18; 23; 24; 26; 28; 29; 45; 46; 47; 50; 53; 54; 56; 57; 58; 70; 72; 74; 76; 77; 80; 82; 103; 104; 105; 106; 108; 110; 134; 142; 143; 153; 154; 157; 159; 160; 163; 164; 165; 166; 170; 171; 173; 174; 175; 176; 180; 181; 182; 184; 185; 186; 190; 193; 201; 208; 216; 217; 236; 237; 238; 239; 240; 242; 243; 244; 248; 249; 250; 251; 256; 257; 271
Lower Murray/Darling 58	8; 11; 12; 13; 15; 16; 17; 18; 20; 21; 22; 23; 24; 28; 50; 58; 63; 64; 65; 119; 123; 124; 128; 139; 143; 150; 151; 152; 153; 154; 155; 156; 157; 159; 160; 163; 164; 165; 166; 170; 171; 172; 181; 182; 189; 190; 191; 196; 199; 216; 220; 221; 238; 240; 242; 252; 253; 254
Murray 52	2; 5; 7; 8; 9; 10; 11; 12; 13; 15; 16; 17; 18; 19; 20; 22; 23; 24; 26; 28; 44; 45; 47; 48; 50; 53; 58; 63; 74; 75; 76; 77; 80; 86; 110; 157; 159; 160; 163; 164; 166; 170; 181; 182; 185; 186; 216; 237; 238; 240; 242
Murrumbidgee 64	2; 5; 7; 9; 10; 11; 12; 13; 15; 16; 17; 18; 22; 23; 24; 26; 28; 44; 45; 46; 47; 48; 50; 53; 57; 58; 74; 75; 76; 77; 80; 110; 142; 143; 153; 154; 157; 159; 160; 163; 164; 165; 166; 170; 173; 181; 182; 185; 186; 201; 216; 217; 236; 237; 238; 239; 240; 242; 243; 249; 250; 251
Namoi 40	24; 27; 35; 36; 37; 39; 40; 43; 49; 50; 52; 53; 55; 56; 70; 71; 83; 87; 88; 98; 115; 144; 145; 146; 161; 168; 181; 182; 195; 204; 206; 211; 212; 214; 227; 238; 241; 242; 244; 247
Western 123	18; 23; 24; 25; 27; 29; 31; 35; 36; 37; 38; 39; 40; 41; 43; 52; 53; 55; 58; 59; 60; 61; 62; 66; 67; 68; 69; 72; 82; 87; 100; 103; 104; 105; 106; 108; 109; 115; 117; 118; 119; 120; 121; 122; 123; 124; 125; 127; 128; 129; 130; 131; 132; 133; 134; 136; 137; 138; 139; 140; 143; 144; 149; 150; 151; 152; 153; 154; 155; 156; 158; 160; 161; 162; 163; 165; 166; 167; 168; 169; 170; 171; 174; 175; 176; 180; 183; 184; 189; 192; 194; 195; 197; 198; 199; 200; 207; 208; 210; 212; 213; 215; 218; 220; 222; 224; 225; 226; 229; 230; 231; 232; 233; 234; 238; 245; 246; 257; 261; 262; 263, 264, 271

Table 9. Number and area of different types of protected areas in New South Wales and in the NSW Western Plains, December 2005.

Protected Area Type	No. in NSW	Area in NSW	% of NSW (ha)	No. in NSW Western Plains	Area (ha) NSW in Western Plains	% of NSW Western Plains
Aboriginal Areas	14	12,075	0.015	1	11,790	0.026
Historic Sites	16	3,236	0.004	3	1,983	0.004
Karst Conservation Reserves	4	4,555	0.006	0	0	0.000
National Parks	173	5,064,165	6.335	13	1,020,280	2.243
Nature Reserves	388	899,112	1.125	30	424,883	0.934
Regional Parks	13	5,463	0.007	0	0	0.000
State Conservation Areas	84	347,580	0.435	3	119,918	0.264
Other Secure DEC Areas	1	9	0.000	0	0	0.000
Total all DEC reserves	693	6,336,195	7.926	50	1,578,853	3.470
Flora Reserves	86	33,317	0.042	12	4,611	0.010
Total all public reserves	779	6,369,512	7.968	62	1,583,464	3.481
Secure PAs (NVC Act)	55	5,542	0.007	16	2,841	0.006
VCAs (NPW Act)*	183	107,164	0.134	5	93,452	0.205
Bush Heritage Reserves	3	988	0.001	0	0	0.000
Total non-public protected areas	241	113,695	0.142	21	96,293	0.212
Total for all protected areas	1,020	6,483,207	8.11	83	1,679,757	3.69

Notes: The areas in the DEC conservation reserves include all areas that were held as acquired lands in December 2005. The figures exclude 163,200 ha of marine parks in coastal waters of NSW and 10,877 ha of land in 10 Crown Reserves managed by DEC in eastern NSW. DEC Acquired lands are allocated to reserve types based on advice from DEC Parks and Wildlife Division expertise. It is assumed that the newly acquired Yanga National Park in south-west NSW will be about 70,600 ha once cleared areas are excised from it and the present Yanga NR is amalgamated with it. Parts of Narran Lake Nature Reserve, Strahorn Flora Reserve, property agreements AL9921 and CD9910 fall outside the Western Plains and are excluded. For example, only 3,534 ha of the 15,239 ha Narran Lake Nature Reserve is within NSW Western Plains. Data sources are: NSW Department of Environment and Conservation Estates GIS layer, December 2005; DEC Acquired Lands GIS layer, December 2005; DEC database on Voluntary Conservation Agreements, December 2005; NSW State Forests Flora Reserves GIS layer, December 2003; Property Agreement data from the NSW Department of Infrastructure, Planning and Natural Resources PANet database and GIS layers, December 2003 - PAs in perpetuity were selected using shape files coded as being remnant vegetation (i.e. excluding cleared land being re-vegetated). *Assumes that VCAs are being made over the 28,906 ha 'Nanya Station' owned by Ballarat University and the 64,653 ha 'Scotia Sanctuary' owned by the Australian Wildlife Conservancy. Calculations were undertaken in Arcview Version 3.3 (ESRI Inc. 1992-2002) in Lamberts projection and AGD66.

- Table 6 shows the plant communities allocated to the 32 major sub-groups in the National Vegetation Information System (NVIS) classification (ESCAVI 2003) that occur in the NSW Western Plains. A mean of about 7 (S.D. 6) communities are listed under each NVIS major sub-group.

Frequency in bioregions

Of the 213 communities 92 are restricted to one bioregion, 56 to two bioregions, 35 to three bioregions, 17 to four bioregions, six to five bioregions, two to six bioregions and three to seven bioregions (Table 7). 148 (70%) of the communities occur in one or two bioregions and in most cases the second bioregion occurrence is mostly less than 30% of the community's distribution. The number of communities per bioregion ranges from 86 in the Darling Riverine Plains Bioregion to 25 in the Simpson-Strzelecki Dunefields Bioregion. Differences in numbers of communities in each Bioregion may be due to differences in the relative heterogeneity of physical environments in the bioregions, arid versus wetter climes between the bioregions, differences in sizes of the bioregions and differences in the detail of information on the vegetation.

Table 8 lists the communities by Catchment Management Authority areas (CMAs). While the classification totally covers the Western and Lower Murray/Darling CMAs it only covers the western part of the six CMAs that run westwards off the NSW Tablelands (Figure 1). The Western CMA area contains 123 communities but it is also the largest CMA in NSW covering 29% of the State.

15 of the 213 communities are considered to be derived from a previous vegetation structure and floristic composition. These are the veg. IDs 143, 150, 160, 163, 164, 165, 166, 168, 183, 212, 216, 224, 229, 236 and 250. Some other native grassland communities could be derived from previous shrublands or woodlands but there was not enough evidence to designate them as such. These derived plant communities are still 'native vegetation' but are considered to be substantially

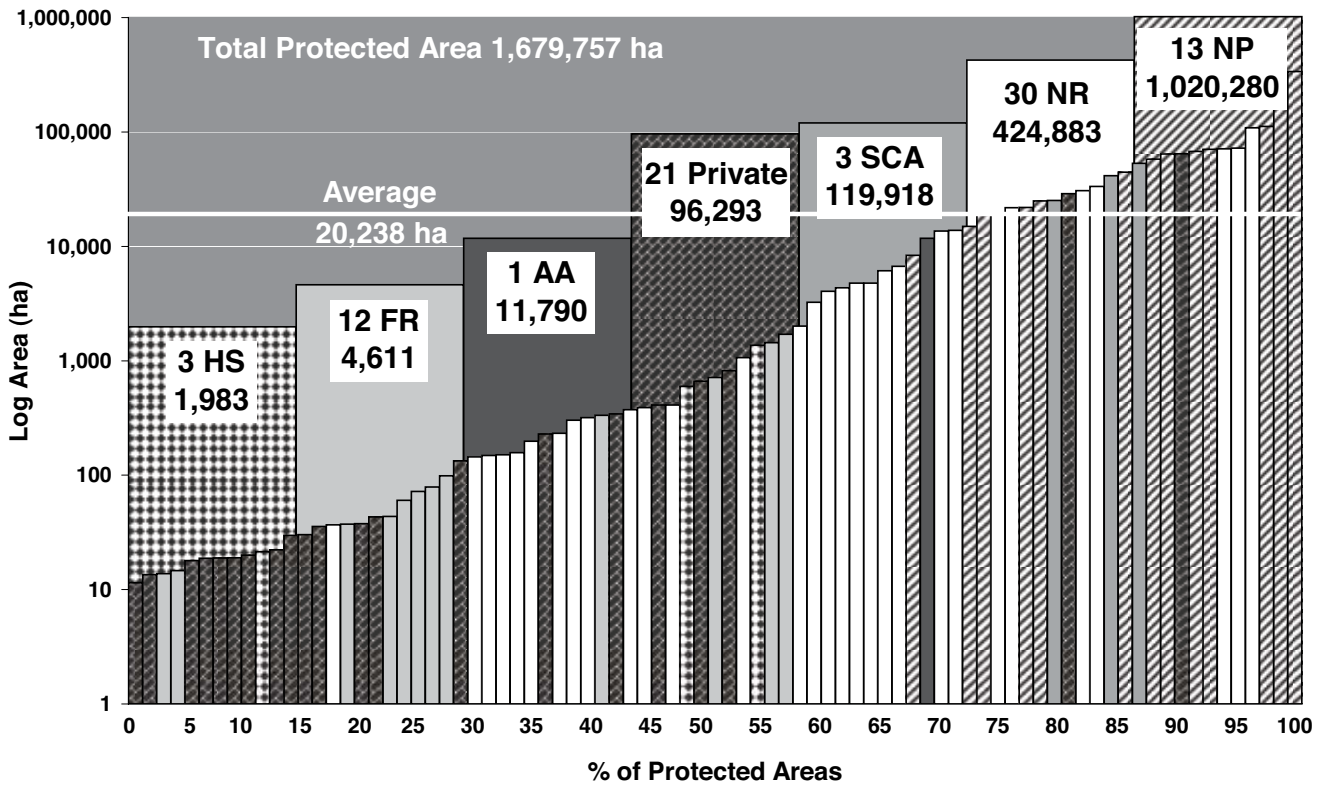

Fig. 6. Area of all protected areas in the Western Plains Section of NSW as of December 2005 assuming all DEC acquired lands at that time are added to reserves.

Thin columns in foreground are areas of individual protected areas. Wide columns in background are cumulative areas for each protected area type. The number, type and area of each protected area type is shown in the white boxes. Columns are: checked = Historic Sites, dark grey = Flora Reserves, light grey = Aboriginal Areas, brick pattern = State Conservation Areas, white = secure property agreements under National Parks and Wildlife Act 1974 and Native Vegetation Act 2003, black = Nature Reserves, and diagonal stripe = National Parks. The two National Reserve System purchased private properties 'Scotia Sanctuary' and 'Nanya Station' are included as VCAs but they are much larger than average property agreements. Only 6,194 ha of the total 15,239 ha area of Narran Lake Nature Reserve is included because most of this reserve is in the Brigalow Belt South Bioregion in the NSW Western Slopes Section.

different in species composition and/or vegetation structure compared to what they would have been prior to European settlement.

55 of the 213 plant communities that occur on the Western Plains also occur on the NSW Western Slopes. The *Eucalyptus* box woodlands, ironbark forests and communities that are found on the NSW Western Slopes will be described in the Part 2 of the NSWVCA project.

A photographic collection of about 4000 images of the plant communities of the Western Plains has been collated, labelled and stored at the Botanic Gardens Trust, Sydney. About 500 of these images have been scanned for use in reports or publications.

Protected areas in the NSW Western Plains

As of December 2005, 8.1% of NSW was held in 1020 protected areas, comprising all types of public conservation reserves and all secure property agreements, as defined and discussed in Benson (2006) (Table 9). In the NSW Western Plains there were 83 protected areas covering 3.7% of that section of NSW – a significantly lower proportion than for the State as a whole.

Of the 779 public reserves in NSW, 62 covering over 1.5 million hectares are in the Western Plains (Table 9, Figure 5). A small number (13 of 173) of NSW national parks are in the Western Plains, covering 1 020 280 ha or about 2.2% of the region. Similarly, only 30 of the 388 nature reserves in NSW are in the Western Plains, covering 424 883 ha or 0.9% of the region though some of the nature reserves such as Yathong, Nombinnie and Nocoleche are large compared to those in eastern NSW. 12 of the 86 Flora Reserves in NSW, protected under the *NSW Forestry Act 1916*, are in the Western Plains. About half of these are located in the River Red Gum forests along the Murray River.

Table 10. Proportion of protected areas in the eight bioregions that comprise the NSW Western Plains

IBRA Bioregion	Protected Area (ha)	% of Bioregion Protected
Broken Hill Complex	75,440	2.0
Channel Country	231,098	9.9
Cobar Peneplain	187,538	2.5
Darling Riverine Plains	157,972	1.7
Mulga Lands	222,815	3.4
Murray Darling Depression	535,891	6.8
Riverina	130,349	1.9
Simpson Strzelecki Dunefields	118,923	10.8
Total for Western Plains	**1,660,025**	**3.7**

Secure property agreements include Conservation Agreements (VCAs) under the *NSW National Parks and Wildlife Act 1974* and some property agreements under the *Native Vegetation Conservation Act 1997* and *Native Vegetation Act 2003* (Benson 2006). By December 2005, there were 183 VCAs in NSW with only five in the NSW Western Plains. These five include two large, recent VCAs covering former Western Lands Leases in far south-western NSW (Nanya 28 906 ha and Scotia 64 653 ha). The other three VCAs are small in area totaling less than 3000 ha. Complementing the VCAs are 16 secure property agreements under the *Native Vegetation Conservation Act 1997*. These cover 2841 ha or 0.006% of the Western Plains. Summing both types of secure property agreements reveals that a miniscule 0.2% of the Western Plains was held under secure property agreements in December 2005 (Table 9).

There are a large range of sizes in the 83 protected areas (graphed on a log scale in Figure 6). The average size of protected areas is 20 238 ha but this is bounded by a very large standard deviation of 46 943 ha (Figure 6). The largest conservation reserve is Sturt National Park at 338 231 ha. Other large reserves include Paroo-Darling National Park (175 683 ha), Nombinnie Nature Reserve (125 871 ha), Yathong Nature Reserve (108 768 ha), Gundabooka National Park (92 121 ha), Mungo National Park (89 502 ha) and Nocoleche Nature Reserve (71 040 ha) and the newly acquired Yanga National Park, that will be about 70 600 ha once cleared areas are excised from it and Yanga Nature Reserve is amalgamated with it. The smallest protected area is the secure property agreement LE9801 covering 11 ha. About one quarter or 21 of the 83 protected areas are above the average size with 62 being less than the average size. Public reserves such as national parks and nature reserve are, on average, larger than secure property agreements that mainly apply over private land (Figure 6).

A number of public conservation reserves are located in the NSW Western Slopes near the boundary of the Western Plains in the Brigalow Belt South and NSW South Western Slopes Bioregions. These contain plant communities that occur in the Western Plains (Table 2). In the Brigalow Belt South Bioregion, reserves close to the boundary of the Western Plains are Brigalow Park (455 ha), Careunga Nature Reserve (469 ha), Kirramingly Nature Reserve (1306 ha) and 11 705 ha of the 15 239 ha of Narran Lake Nature Reserve. In the NSW South Western Slopes Bioregion reserves close to the boundary of the Western Plains are Wiesners Swamp Nature Reserve (103 ha), The Rock Nature Reserve (347 ha), Buckingbong Flora Reserve (155 ha), Wilbertroy Flora Reserve (134 ha) and Narrandera Nature Reserve (58 ha). Narrandera Nature Reserve contains similar vegetation to the nearby Narrandera Flora Reserve indicating the need for minor adjustments to bioregion boundaries.

Table 11. Plant communities identified by their NSWVCA database ID number listed under a range of proportions of estimated pre-European extent in protected areas
Note: This includes occurrences of plant communities that extend to the NSW Western Slopes and occur in protected areas there. Several derived communities are in 50-100% category because it is considered they may either have not existed in 1788 or have expanded.

Protected pre-European Extent	**Community ID Number**	**Number of plant communities**
0	22, 48, 83, 86, 115, 136, 169, 175, 183, 188, 195, 205, 211, 221, 222, 224, 225, 226, 228, 235, 242, 246, 248, 249, 253, 254, 257, 258, 262, 263, 271	31
>0 - <0.2%	10, 16, 20, 26, 27, 29, 44, 47, 50, 55, 56, 70, 74, 76, 80, 88, 145, 146, 159, 201, 237, 238, 241, 244	24
0.2 - <0.5%	35, 52, 69, 75, 82, 87, 168, 206, 227, 233, 251	11
0.5 - <1%	17, 18, 31, 45, 71, 98, 100, 105, 110, 118, 125, 156, 157, 158, 167, 192, 214, 243, 252, 256	20
1 - <2%	5, 8, 21, 25, 28, 37, 40, 53, 77, 103, 104, 119, 129, 144, 154, 182, 196, 204, 247, 264	20
2 - <5%	9, 12, 15, 19, 23, 24, 36, 39, 43, 49, 54, 58, 62, 63, 106, 108, 109, 117, 120, 123, 128, 130, 142, 153, 162, 170, 184, 185, 212, 240	30
5 - <10%	7, 13, 46, 57, 59, 60, 64, 67, 68, 72, 133, 134, 137, 138, 149, 151, 160, 176, 189, 193, 194, 207, 208, 217, 218	25
10 - <15%	2, 11, 38, 66, 139, 140, 155, 161, 171, 172, 174, 180, 181, 197, 198, 199, 200, 213, 215, 220, 234, 245	22
15 - <20%	41, 61, 124, 152, 173, 186, 230	7
20 - <50%	131, 150, 164, 190, 216, 231, 232, 239, 250, 261	10
>=50%	65, 121, 122, 127, 132, 143, 163, 165, 166, 191, 210, 229, 236	13

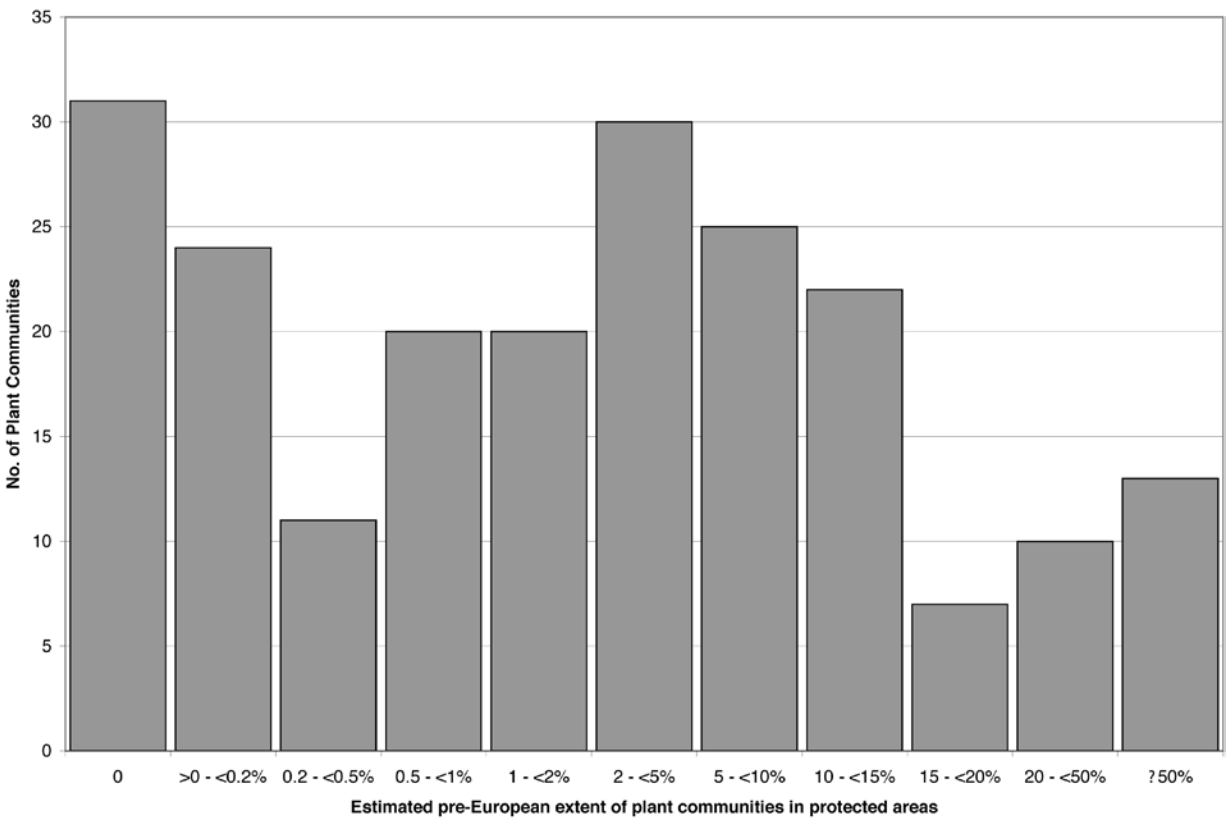

Fig. 7. Proportions of the 213 plant communities classified for NSW Western Plains in protected areas. The percentage divisions are derived by comparing the estimated existing area in protected areas to an estimate of pre-European extent. 75% of the plant communities have less than 10% of their pre-European extent in protected areas

Table 12. NSW Western Plains plant communities that are part of critically endangered, endangered or vulnerable ecological communities listed or nominated under the NSW Threatened Species Conservation Act 1995 and/or the Australian Environmental Protection and Biodiversity Conservation Act 1999 as of December 2005.
Note: The plant communities defined in the NSWVCA do not necessarily match the definitions of listed or nominated ecological communities under these laws. This list ignores three broadly defined inland aquatic endangered ecological communities listed under the NSW Fisheries Act that cover vertebrates and invertebrates.

ID No.	Common Name	TSC Act	EPBC Act
20	Buloke - Moonbah - Black Box open woodland on sandy rises of semi arid (warm) climate zone	Nominated	Listed
22	Semi-arid shrubby Buloke - Slender Cypress Pine woodland	Nominated	Listed
23	Yarran shrubland of the sandplains and plains of the semi-arid (warm) and arid climate zones	Nominated	-
26	Weeping Myall open woodland of the Riverina and NSW South Western Slopes Bioregions	Listed	Nominated
27	Weeping Myall open woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions	Listed	Nominated
29	Brigalow open woodland on red earth and clay plains mainly in the Mulga Lands Bioregion	Nominated	Listed
31	Brigalow-Gidgee open woodland on clay plains west of the Culgoa River, Mulga Lands Bioregion	Nominated	Listed
35	Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion.	Listed	Listed
37	Black Box woodland on floodplains mainly in the Darling Riverine Plains Bioregion.	Listed	Nominated
39	Coolabah - River Coobah - Lignum woodland of frequently flooded channels mainly of the Darling Riverine Plains Bioregion	Listed	Nominated
40	Coolabah open woodland with chenopod/grassy ground cover on grey clays on higher floodplains	Listed	Nominated
44	Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	-	Nominated
45	Plains Grass grassland on alluvial dark grey clays of central New South Wales	-	Nominated
46	Curly Windmill Grass - speargrass - wallaby grass on alluvial clay and loam on the Hay Plain, Riverina Bioregion	-	Nominated
47	Swamp grassland of the Riverine Plain	-	Nominated
52	Queensland Bluegrass - Cup Grass - Mitchell Grass - Native Millet alluvial plains grassland	-	Listed
54	Buloke - White Cypress Pine woodland mainly in the NSW SW Slopes Bioregion	Nominated	Listed
65	Halosarcia lylei low, open shrubland of arid and semi-arid regions	Listed	-
66	Artesian Mound Spring forbland/sedgeland/grassland mainly of the Mulga Lands Bioregion	Listed	Listed
71	Carbeen woodland on alluvial soils	Listed	-
76	Inland Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Nominated	Nominated
77	Yarran shrubland on peneplains and alluvial plains of central-northern NSW	Nominated	-
80	Inland Grey Box - White Cypress Pine tall woodland on sandy loam soil on alluvial plains of NSW South-western Slopes and Riverina Bioregions	Nominated	Nominated
81	Inland Grey Box tall grassy woodland on clay soils in the Brigalow Belt South and Nandewar Bioregions	Nominated	Nominated
82	Inland Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	Nominated	Nominated
86	Yellow Gum tall woodland of the Murray River floodplain, Riverina Bioregion	Nominated	-
110	Inland Grey Box - Black Cypress Pine shrubby woodland on stony slopes NSW South Western Slopes and Riverina Bioregions	Nominated	Nominated
128	Nelia tall open shrubland of semi-arid sandplains	Listed	-
158	Old Man Saltbush shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	Nominated	Nominated
159	Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	Nominated	Nominated
201	Fuzzy Box - Inland Grey Box on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Listed	-
220	Purple Wood wattle shrubland of the arid zone sandplains	Nominated	-
237	Riverine Inland Grey Box grassy woodland of the semi-arid (warm) climate zone	Nominated	Nominated

Table 13. Number of plant communities in threat categories in relation to protected area codes
Notes. Explanations of the protected area and threat codes are provided in Benson (2006). See Appendix B in Benson (2006) for explanation of the threat categories.

	No. of Extant NSW Western Plains Plant Communities Protected Area Code															
Threat Category	1a	1b	1c	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	5c	Total
Critically Endangered (CE)	-	-	-	-	-	-	-	-	-	-	-	-	5	4	2	11
Endangered (E)	-	-	-	-	-	-	1	-	-	8	-	-	16	4	2	31
Vulnerable (V)	-	-	1	-	-	-	5	-	-	6	1	-	11	4	-	28
Near Threatened (NT)	-	-	-	1	-	-	14	-	2	15	1	-	19	6	4	62
Least Concern (LC)	7	8	-	4	3	-	19	1	-	13	5	1	7	11	2	81
Total	7	8	1	5	3	-	39	1	2	42	7	1	58	29	10	213

Table 14. Number of plant communities with different threat categories distributed across the eight bioregions that comprise the NSW Western Plains.
Figures in brackets ( ) indicate the number of plant communities (of the total) that are restricted to a single IBRA Bioregion. Bioregions: BHC = Broken Hill Complex, CHC = Channel Country, CP = Cobar Peneplain, DRP = Darling Riverine Plain, MDD = Murray Darling Depression, ML = Mulga Lands, RIV = Riverina, SSD = Simpson-Strzelecki Dunefields. See Appendix B in Benson (2006) for explanations of the threat categories.

	No. of Extant NSW Western Plains Plant Communities IBRA Bioregion v6								
Threat Category Code	Broken Hill Complex	Channel Country	Cobar Peneplain	Darling Riverine Plain	Mulga Lands	Murray-Darling Depression	Riverina	Simpson-Strzelecki Dunefields	Total Western Plains
Critically Endangered	1	-	2	4 (1)	1 (1)	3	6 (1)	-	11 (3)
Endangered	1	1	8	19 (2)	4	5 (1)	7 (3)	-	31 (6)
Vulnerable	1	-	8 (1)	18 (4)	6	9 (3)	10	-	28 (8)
Near Threatened	15	9	22 (3)	29 (2)	25 (2)	26 (1)	18 (2)	9 (1)	62 (11)
Least Concern	19 (4)	22 (4)	26 (6)	18	33 (4)	28 (5)	14 (3)	16 (5)	81 (31)
Total	37 (4)	32 (4)	66 (10)	88 (9)	69 (7)	71 (10)	55 (9)	25 (6)	213 (59)

Table 15. Number of plant communities with different threat categories distributed across eight Catchment Management Authority areas that are fully or partly in the NSW Western Plains.
Figures in brackets ( ) indicate the number of plant communities (of the total) that are restricted to a single CMA area. *This assessment does not represent an entire list of plant communities for the Border Rivers/Gwydir, Namoi, Central West, Lachlan, Murrumbidgee or Murray CMAs because only the western part of these CMAs are in the NSW Western Plains. See Appendix B in Benson (2006) for an explanation of the threat categories.

	No. of Extant NSW Western Plains Plant Communities Catchment Management Authority Areas								
Threat Category Code	Lower Murray/ Darling	Western	Murray*	Murrumbidgee*	Lachlan*	Namoi*	Border Rivers/ Gwydir*	Central West*	Total Western Plains
Critically Endangered	4	3 (1)	6	6	4	1	2 (2)	3	11 (3)
Endangered	3	10	9 (2)	8	10 (1)	15	15 (1)	19	31 (4)
Vulnerable	8 (3)	8 (1)	8	12	13 (1)	11	11	16	28 (5)
Near Threatened	22 (1)	40 (14)	15	19	24	7	10 (1)	18 (2)	62 (18)
Least Concern	21 (5)	62 (40)	13	18	29	6	4	18	81 (45)
Total	58 (9)	123 (56)	51 (2)	63	80 (2)	40	42 (4)	74 (2)	213 (75)

Only three bioregions have greater than 5% of their extent sampled in protected areas (Table 10). These are the Simpson-Strzelecki Dunefields Bioregion with 10.8%, the Channel Country Bioregion with 9.9% and the Murray-Darling Depression Bioregion with 6.7%. Sturt National Park accounts for most of the protected area status in the Simpson-Strzelecki Dunefields and Channel Country Bioregions. Conversely, bioregions with very poor representation in protected areas include the Riverina Bioregion with 1.9%, Darling Riverine Plains with 1.7%, Broken Hill Complex with 2.0% and Cobar Peneplain with 2.5%. Therefore, if a target of sampling 10% of a bioregion in protected areas is adopted, reflecting IUCN (1994) guidelines, then only one bioregion (the Simpson-Strzelecki Dunefields) meets the target with the Channel Country Bioregion just below it.

The vast majority of the 213 plant communities in the NSW Western Plains are very poorly represented in protected areas (Table 11, Figure 7). 31 or 15% have no known representation in protected areas. 86 or 40% have between 0–1% of their estimated pre-European extent in protected areas, 50 or 23% have between 1 and 5% and 47 or 22% have between 5 and 15% (Table 11). 52 or 24% of the 213 plant communities classified for the NSW Western Plains meet the international target of sampling 10% of extent in protected areas (IUCN 1994). The Australian forest protection criteria in JANIS (1997) prescribe adequate protection as being at least 15% of the original extent of a community in protected areas (ignoring the higher threshold protection requirements of restricted or rare communities used in JANIS); only 30 or 14% of the 213 plant communities currently meet this standard.

Taking the above statistics into account, it can be stated that less than one quarter of the plant communities in the NSW Western Plains are adequately represented in protected areas when applying international targets for representation. The corollary of this is that three quarters are under-represented in the protected area system.

Assessment of threats to the vegetation

It is important to emphasise that a caveat should apply to any species or ecological community threat assessment and categorization. The main purpose of threat status assessment is to assist with setting priorities for management and conservation action. If an ecological community is judged not to be threatened, at a particular juncture, it does not imply that areas of it do not contain important wildlife or landscape values worthy of protection. In the fragmented and degraded landscapes of NSW, every patch of bush may be important for certain animal or plant species or for protecting landscape features or ecological processes including lowering saline water tables, mitigating soil erosion and providing services such as pollinators for crops or shade for stock (Smith et al. 2000, Gillespie 2000). Native vegetation, whatever its threat status, may also important in Aboriginal and European cultural life (Lambert & Elix 2000).

This threat assessment of the plant communities of the NSW Western Plains complements previous assessments of restricted or rare plant species in the region (Pressey et al. 1990, Bowen & Pressey 1993).

As of December 2005, 8 NSW VCA defined plant communities were listed and 17 were nominated for listing under the

Fig. 8. Land clearing of *Eucalyptus intertexta* (Smooth-barked Coolabah) woodland (ID104) north-west of Nyngan in central western NSW. Clearing remains the major threat to some plant communities in western NSW including on the eastern edge of the NSW Western Division. Photograph, Jaime Plaza, 27/8/2003.

Fig. 9. Isolated *Callitris glaucophylla* (White Cypress Pine) on eroded lake lunette (ID152) near Lake Nitchie in the Darling Ana Branch in far south western NSW. Accelerated erosion due to high stocking rates degraded large areas of western NSW in the late 1800s and early 1900s. Some areas have not recovered. Natural erosion may also have been occurring on these ancient lunettes. Photograph, Jaime Plaza, 14/4/2002.

Australian *Environmental Protection and Biodiversity Conservation Act 1999*. 11 NSWVCA communities were listed and 17 were nominated for listing as threatened ecological communities under the NSW *Threatened Species Conservation Act 1995* (Table 12). The NSWVCA plant communities do not necessarily equate precisely in definition to these legal listings. Some are equivalent to them and others form part of the listings or nominations. Given the suggested threat status of other communities classified in the NSWVCA, it is anticipated that more communities will be listed under these laws in the future.

Fig. 10. *Eucalyptus camaldulensis* (River Red Gum) woodland lining the Bogan River in the Darling Riverine Plains Bioregion (ID36). Although large areas of River Red Gum remain along the Murray River in southern NSW, vegetation lining inland river systems in the NSW central-northern wheatbelt have been affected by clearing, weed invasion, trampling by stock and reduced flooding regimes. Photograph, Jaime Plaza, 27/10/01.

Fig. 11. *Eucalyptus coolabah* (Coolabah) open woodland ID40) with a grassy ground cover south of Goodooga north-west plains of NSW. Coolabah is largely cleared in the NSW Central Division with some larger patches remaining in the Western Division. The long term survival and regeneration of Coolabah woodland is threatened by clearing and reduction in floodplain flooding due to the draw-off of river flow for irrigation. Photograph, J.Plaza, 21/10/01.

Applying the threat criteria and threat categories outlined in Appendix B of Benson (2006), to the 213 plant communities in the NSW Western Plains, 71 or one third of them (33%) are judged to be threatened, that is, 'critically endangered' (CE), 'endangered' (E) or 'vulnerable' (V) (Table 13). Of these 11 are considered to be 'critically endangered' and 31 'endangered'. Another 62 communities are considered to be 'near threatened' and 81 as being of 'least concern'. However, many of the 'least concern' and 'near threatened' categorized communities may become threatened over the coming decades if particular threatening processes are not mitigated. The four main threats are high, continuous grazing pressure throughout the Western Plains, vegetation clearing in the eastern third of the region, rises in saline water tables (NSW Department of Land and Water Conservation 1999) and reductions in natural flooding regimes on floodplains. Reducing total grazing pressure includes controlling feral animal numbers, particularly rabbits and goats, not just dealing with grazing regimes of domestic stock.

Most threatened (CE, E, V) plant communities are poorly represented in protected areas (i.e. with a protected area code of 4 or 5), however a few are moderately well protected (i.e. with a protected area code of 3) (Table 13). All but one of the communities that are well represented in protected areas (protected area codes 1 and 2) are recorded as either 'near threatened' or 'least concern' — probably because most occur in the arid, far western parts of NSW beyond the main clearing belt.

Since many threatening processes affect whole landscapes irrespective of land tenure, it is important not to consider a community as 'safe' just because it is well represented in protected areas. Some threatening processes in the Western Plains extend into national parks and nature reserves – for example weed invasion, feral herbivores, soil erosion, flooding regime change and climate change.

The threatened (CE, E, V) communities are distributed unevenly across the eight bioregions in the Western Plains (Table 14). 6 of the 11 'critically endangered' communities occur in the Riverina Bioregion while none occur in the arid climate zone Channel Country or Simpson-Strzelecki Dunefields Bioregions (Table 14). 23 of the 42 'critically endangered' and 'endangered' communities occur in the Darling Riverine Plains Bioregion with only a few occurring in the arid zone bioregions to the west (Table 14). There are similar patterns for 'vulnerable' communities. These findings reflect the impact of land clearing in the wetter climate regimes and in the alluvial soil-dominated Riverina and Darling Riverine Plain Bioregions compared to the sand plains and rocky ranges of the drier, far inland bioregions. Similar trends are repeated with the CMA areas (Table 15). Compared to the fully assessed Western and Lower Murray/ Darling CMA areas, there are more threatened communities recorded in the Murrumbidgee, Murray, Lachlan and Central

West CMAs even though the vegetation of the eastern half these CMAs is not included in this classification or assessment.

The most common threatening processes, recorded in the NSWVCA database, to the plant communities in the NSW Western Plains are:

- Land clearing that affects plant communities in the wetter, eastern third of the Western Plains including the *Eucalyptus* box woodlands (Figure 8), *Casuarina* and *Acacia* woodlands and a variety of native tussock grasslands and wetlands;
- Wind and sheet soil erosion, due to 150 years of grazing by stock and feral animals such as rabbits and goats (Figure. 9);
- Altered hydrological regimes, due to irrigation draw off of water from rivers and artesian aquifers that threatens riparian and floodplain forests and woodlands including *Eucalyptus camaldulensis* (River Red Gum) (Figure 10*), Eucalyptus coolabah* (Coolabah) (Figure 11) and *Eucalyptus largiflorens* (Black Box) (Figure 12) woodlands and mound springs (Figure 13). Wetlands in the eastern half of the Western Plains are highly threatened, including some registered on international RAMSAR wetland list such as the Macquarie Marshes that has been reduced from about 200 000 ha to about 50 000 (W. Johnson pers. comm.) and the Gwydir River wetlands that are now surrounded by irrigated crops and have been reduced from an estimated 50 000 ha to about 1000 ha (Southeron 2002). Other threatened wetlands include the Lowbidgee wetlands on the floodplain of the lower Murrumbidgee River that have been cleared and drained, and the Culgoa River floodplain in the Darling Riverine Plains Bioregion where regular flooding is now rare due to upstream irrigation development in Queensland;
- Exotic weed invasion, most prevalent in highly fragmented plant communities on richer soils including riparian zones;
- Dieback due to disease. For example, saltbush dieback in the Riverina Bioregion (Cliff et al. 1987, Semple 1989);
- Increased extent of salinity (Bradd & Gates 1996, NSW Department of Land and Water Conservation 1999) (Figure 14).

The main consequences of these impacts on the vegetation are a loss of extent, simplification of vegetation structure and loss of biomass, changes in plant species composition

Fig. 13. Artesian mound spring sedgeland-grassland (ID66) at in the arid zone at Peery Lake in Paroo-Darling National Park, Mulga Lands Bioregion. This is one of the only remaining active mound springs in NSW. Most mound springs have become 'extinct' due to draw down in artesian hydrostatic pressure from the use of bores over the last 100 years. Three threatened plant species occur on this spring. Photograph, Jaime Plaza, 23/10/01.

Fig. 12. *Eucalyptus largiflorens* (Black Box) woodland (ID37) with *Atriplex nummalaria* (Old Man Saltbush) in the understorey at Marra Creek, west of Byrock, Darling Riverine Plains Bioregion. This community has largely been cleared for grazing and cropping. Photograph, Jaime Plaza, 27/8/03.

Fig. 14. Dead *Eucalyptus largiflorens* (Black Box) woodland (formally ID13) between Echuca and Barham on the Murray River floodplain in south western NSW. This low lying woodland has been killed by a rising saline watertable due to over-clearing of native vegetation in the catchment since European settlement in the 1840s. Photograph, Jaime Plaza, 10/4/2002.

and loss of fauna species. There has generally been a loss of ground cover and recruitment is limited for most palatable, perennial plant species – many of which are major components of plant communities. In the long term this could lead to further structural and compositional changes as woody native trees and shrubs become senescent and are replaced by less palatable shrubs, grasses and forbs.

Most of the NSW Western Plains is in the NSW Western Division, an administrative part of NSW (see Figure 1 in Benson 2006) where the main land tenure is leasehold. This arid and semi-arid region reverted from freehold tenure to leasehold as a consequence of the recommendations in the 1901 Royal Commission into the Western Division based on the impacts on soil erosion and vegetation cover changes due to over-grazing and drought in the late 19th Century. In the latter half of the 20th Century cropping began to expand into areas of the Western Division that had previously been used for extensive grazing. A 1984 NSW Parliamentary Inquiry into the Western Division raised concerns about this expansion of cropping because of its impacts on degradation.

The NSW wheatbelt in the Central Division of NSW (see Figure 1 in Benson 2006) comprises the eastern third of the NSW Western Plains. It is mainly cleared (Benson 1999, Bedward et al. 2001). In some parts of the wheatbelt less than

Fig. 15. *Callitris glaucophylla* (White Cypress Pine) woodland (ID19) on a source-bordering dune in Millewa State Forest on the Murray River floodplain. Regeneration of the pine on this dune was severely impaired by rabbit grazing. Fencing the dune has assisted with regeneration. Photograph, Jaime Plaza, 10/4/02.

Fig. 16. *Swainsona formosa* (Sturts Desert Pea) in plant community ID133 Western Bloodwood *Corymbia tumescens* (Western Bloodwood) - *Atalaya hemiglauca* (Whitewood) low open woodland on Tibooburra Granite. This spectacular plant is endangered in NSW due to 150 years of grazing by domestic stock and is restricted to a few sites where grazing has been limited. Photograph, Jaime Plaza, 24/8/2003.

Fig. 17. *Atriplex nummularia* (Old Man Saltbush) chenopod shrubland (ID159), near Balranald, far south western New South Wales. Old Man Saltbush has been eliminated by domestic stock and the shrubland is now restricted in extent and endangered. Photograph, Jaime Plaza, 12/4/02.

Fig. 18. *Atriplex vesicaria* (Bladder Saltbush) and *Disphyma crassifolium* subsp. *clavellatum* (Round-leaf Pigface) chenopod shrubland (ID157), on alluvial clay plains north of Maude in the Riverina Bioregion. Limited areas of this community is presently sampled in protected areas as of 2005 and Bladder Saltbush shrubland has retracted in extent over the last 100 years due to grazing pressure and dieback caused by insect attack. Photograph, Jaime Plaza, 12/4/02.

20% of native woody vegetation remains (Benson 1999). Clearing continues in the northern part of the wheatbelt mainly for crops such as wheat and cotton. Cropping continues to expand westwards affecting large tracts of country that could be termed 'marginal' due to low rainfall and average soil. This particularly affects the Nyngan-Walgett region of central-north NSW. Clearing on the eastern edge of the Cobar Peneplain, often justified as clearing 'woody weeds', is also clearing mature *Eucalyptus* trees such as *Eucalyptus intertexta* (Smooth-barked Coolabah) (Figure 8) that appears to have low recruitment compared to other species of *Eucalyptus* (J. Benson pers. obs.)

Stock and feral animal grazing continue to degrade native vegetation throughout the NSW Western Plains (Auld 1995, Lang & Graham 1983, Pickard 1991a, 1991b, 1993). While grazing management by domestic stock has generally improved since the mid 20th Century, goats and rabbits continue to impair the recruitment of native plant species. Grazing is notably inhibiting the regeneration of key plant species in *Acacia* shrublands on sandplains and rocky ranges, *Casuarina cristata/pauper – Alectryon olieofolius* (Belah-Western Rosewood) low woodlands and dune *Callitris* (cypress pine) communities (Figure 15). Inflated numbers of kangaroos, due to the provision of bore water, are also impacting on vegetation regeneration, for example

Fig. 19. *Atriplex vesicaria* (Bladder Saltbush) chenopod shrubland on the Barrier Range (ID156) composed of metamorphic and sedimentary substrates, near Corona north of Broken Hill in the arid climate zone. This community is widespread but very poorly represented in protected areas as of 2005. Photograph,Jaime Plaza, 24/10/01.

Fig. 21. Samphire chenopod shrubland (ID64) dominated by *Halosarcia pergranulata* subsp. *pergranulata* and *Halosarcia indica* subsp. *leiostachya* on a dry lake on Nanya Station. Although most of the samphire communities in western NSW are not threatened, they are poorly represented in protected areas. Photograph, Jaime Plaza, 15/4/02.

Fig. 20. *Maireana astrotricha* (Low Bluebush) low open chenopod shrubland (ID222) on gibber downs, 'The Veldt' station, Coko Range, west of the Silver City Highway, far north western NSW. This community is not represented in protected areas in NSW and is more common in South Australia. Photograph, Jaime Plaza, 22/8/03.

Fig. 22. *Acacia aneura* (Mulga) shrubland (ID119) on a sand plain west of Bourke, north western NSW. Mulga is very widespread on sand plains (ID119) and stony rises (ID120). It has been partially cleared and is often cut for fodder. Goat grazing is threatening Mulga on rocky ranges. Photograph, Jaime Plaza, 22/10/01.

in Sturt National Park. The Desert Pea (*Swainsona formosa*) (Figure 16) is an example of a palatable plant species that was widespread and is now restricted to a few locations due to grazing. Even after the release of the Rabbit Calicivirus Disease in 1995, that significantly lowered rabbit populations in arid and semi-arid climatic regions, the regeneration of palatable shrubs has been demonstrated to be slow or non-existent — even in reserves where domestic stock are excluded (Denham & Auld 2004). This may be explained by the slow growth rate of perennial plant species in regions with low rainfall.

While protected areas can be de-stocked and feral animals controlled, some threats to vegetation cannot be mitigated through site management. These include maintaining flooding regimes in river systems where irrigation has substantially reduced natural flooding, and the ramifications of climate change on species survival and ecosystem functioning.

Fig. 23. *Acacia harpophylla* (Brigalow) regrowth woodland (ID35) in Brigalow Park Nature Reserve near Moree in the northern wheatbelt of NSW. This Brigalow community is endangered with less than 5% remaining and much of it is regrowth from previous cutting and clearing. Photograph, J.Plaza, 19/10/01.

Fig. 24. *Acacia cambagei* (Gidgee) woodland (ID118), 40km ESE of Wanaaring, far north western plains of NSW. Photograph, Jaime Plaza, 26/8/03.

If carbon dioxide and other greenhouse gas emissions continue unabated, temperatures in western NSW may rise between 0.5 degrees and 3 degrees by 2030 and between 1 and 7 degrees by 2070 (Hennessy et al. 2004). North-western NSW is predicted to suffer the highest temperature rises. Rainfall is expected to decrease on average by up to 15% in 30 years, and by up to 60% in some seasons by 2070 (Hennessy et al. 2004). Due to an increase in the frequency of El Nino climatic events droughts are likely to occur every 2–4 years over the next 70 years rather than every 7 years as is the current case (Hennessy et al. 2004). These statistics are guarded by large confidence levels but the indisputable trend is for hotter conditions in the inland regions of NSW. While little is known about the adaptability of native plant and animal species to such rapid climatic changes, some species may become extinct, at least locally. Due to increased vegetation clearing and habitat fragmentation there are also increasing barriers to species movement over time to locations with suitable climatic regimes.

Management and conservation priorities

The reservation status of land units in the Western Division part of the NSW Western Plains was investigated by Pressey & Nicholls (1989) applying a minimum-set approach to mapped land systems. Subsequently Pressey & Logan (1995) investigated the protected area status of the Western Division in relation to coarseness of land classifications. Since those analyses, there has been an increase in the number and area of conservation reserves in the Western Plains including major extensions to Paroo-Darling, Sturt, Mungo and Gundabooka National Parks, and in the Riverina Bioregion the dedication of Yanga National Park and several other reserves. However, protected areas still only cover 3.7% of the NSW Western Plains and 75% of the plant communities in the Western Plains

Fig. 25. *Acacia pendula* (Weeping Myall) woodland (ID27), north of Warren in the Darling Riverine Plains Bioregion. Weeping Myall woodland is endangered throughout its range due to clearing being focused on the alluvial clay soils on which it grows. Photograph, Jaime Plaza, 17/8/03.

have less than 10% of their pre-European estimated extent sampled in protected areas. Therefore, more protected areas are required to reach the minimal international standards set in IUCN (1994) or the national standards set out in the Natural Resource Management Ministerial Council directions for an Australian National Reserve System (NRMMC 2004).

The 'key sites for protection' field in the NSWVCA database provides some guidance to sites or regions to investigate for new protected areas. The 'planning and management' database field comments on management priorities.

Plant communities that are poorly represented in protected areas, for example, with less than 5% of their original extent protected, coupled with those that are 'critically endangered', 'endangered' or 'vulnerable', should be given priority for protection in future reserves and secure property agreements. These communities can either be gleaned from Table 2 or derived by manipulating the spreadsheet in Appendix F on the CD that contains a list of the communities by ID Number and common name, their threat category, protected area code and percentage in protected areas. It is also possible to select plant communities by protected area status of threat category though the query mode in the full version of the NSWVCA database. This is not possible to do on the read-only database version.

Fig. 26. *Eucalyptus microcarpa* (Inland Grey Box) woodland (ID76) near Berrigan in the Riverina Bioregion. About 95% of this community has been cleared and it is endangered. Inland Grey Box also occurs in several other communities in central NSW. Photograph, Jaime Plaza, 9/4/02.

Fig. 27. *Eucalyptus populnea* subsp. *bimbil* (Poplar Box) grassy woodland occurring on loamy soils on the alluvial plains of the Darling Riverine Plains and Brigalow Belt South Bioregions (ID244) is threatened because most of it has been cleared for grazing or cropping. Photograph, Jaime Plaza, 27/10/01.

Planning for other factors such as climate change may alter priorities. For example, it may be deemed to be as important to provide habitat linkages in well protected or non-threatened communities as concentrating conservation planning on protecting threatened or poorly reserved communities.

Strategies for protecting the plant communities should vary from region to region. New reserves could be established at a relatively low cost to improve the sampling of plant communities that occur in the semi-arid and arid rangelands. This system could be complemented by secure property agreements over Western Lands Leases where landholders would be encouraged and if possible, paid to manage their land holdings for conservation values. The main ongoing management cost for protected areas in such regions is the control of feral animals, particularly goats. When considering the higher rainfall, eastern parts of the NSW Western Plains (the wheatbelt) where clearing has left few large patches of native vegetation, it would be rarely possible to purchase and reserve large parcels of land. Achieving a target of protecting 10% of the original extent of some of these over-cleared communities would require revegetation. A two pronged approach is recommended for the wheatbelt. Some sites containing threatened or poorly protected communities in good condition, in terms of their species composition and vegetation structure, could be acquired and dedicated as public conservation reserves. However, the majority of protected areas should be long term property agreements with landholders. These should be pursued as part of the Property Vegetation Planning Process (PVP) instigated in New South Wales under the *Native Vegetation Act 2003* that is administered by 13 Catchment Management Authorities and the NSW Department of Natural Resources. The NSWVCA database and its linked spreadsheet tables could be used to set priorities for PVPs and monitor changes in the protected area status of plant communities over time.

While it would be unwieldy to describe all the plant communities requiring special management or conservation action, some notably poorly protected and/or highly threatened plant communities include:

- Chenopod shrublands including the endangered *Atriplex nummularia* (Old Man Saltbush) communities (IDs 158, 159) (Figure. 17); the *Atriplex vesicaria* (Bladder Saltbush) (IDs 156, 157 & 197) dominated communities on the

alluvial plains of the Riverina and Darling Riverine Plains Bioregions (Figure 18) and on the stony downs in the Barrier Range in the Broken Hill Complex Bioregion (Figure 19); *Mairaena* (bluebush) shrublands on alluvium IDs 153, 154) and Bluebush shrublands on stony ranges (IDs 155, 222) (Figure 20); and *Halosarcia, Frankenia, Sclerostegia* spp. (samphire shrublands) (IDs 18, 62, 63, 64, 65) (Figure 21) of saline areas mainly in the arid climate zone;

- Acacia woodlands or shrublands including *Acacia aneura* sens lat. (Mulga) (IDs 119, 120) (Figure 22); *Acacia harpophylla* (Brigalow) (IDs 29, 31, 35) (Pulsford 1984)(Figure 23); *Acacia cambagei* (Gidgee) (ID118) (Figure 24); *Acacia pendula*(Weeping Myall) (IDs 26, 27) (Figure 25) and *Acacia melvillei/homalophylla* complex (Yarran) (IDs 27, 77) are poorly represented in protected areas and some communities are highly threatened even inside reserves (Porteners 2001). Stands of Brigalow and Gidgee occur in the Mulga Lands Bioregion between Culgoa National Park and Ledknapper Nature Reserve. Small remnants of Weeping Myall (*Acacia pendula*) occur on the alluvial soils in central NSW;

Fig. 28. *Eucalyptus conica* (Fuzzy Box) woodland (ID201) predominantly occurs on the NSW Western Slopes such as this site near Forbes. It is rare on the Western Plains. Fuzzy Box communities in NSW are endangered because they occur on alluvial and colluvial loamy soils that have largely been cleared for agriculture. Remnants are often infested with exotic weeds. Photograph, Jaime Plaza, 10/10/02.

Fig. 29. *Eucalyptus leucoxylon* subsp. *pruinosa* (Yellow Gum) woodland (ID86), Yarrein Creek, west of Moulamein in the Riverina Bioregion. This community is rare in NSW and is threatened by lack of regeneration, clearing and salinity. Stands on private land urgently need to be fenced off from stock grazing. Photograph, Jaime Plaza, 11/4/02.

- Grassy *Eucalyptus* box woodlands in the eastern part of the Western Plains including in the NSW wheatbelt are generally poorly represented in protected areas. They have been substantially cleared and most are exposed to a number of threatening processes. These include woodlands dominated by *Eucalyptus microcarpa* (Inland Grey Box) (IDs 76, 80, 82, 110, 237) (Figure 26), *Eucalyptus populnea* subsp. *bimbil* (Poplar Box) (IDs 56, 87, 88, 244) (Figure 27), *Eucalyptus melliodora* (Yellow Box) (IDs 74, 75, 83), *Eucalyptus conica* (Fuzzy Box) (ID201) (Figure 28) and the restricted occurrences of *Eucalyptus leucoxylon* subsp. *pruinose* (Yellow Gum) (ID86) in the Riverina (Fig.29);
- Riverine and floodplain forests and woodlands dominated by *Eucalyptus camaldulensis* (River Red Gum) (IDs 2, 5, 7, 8, 9, 10, 11, 36) (Figures 10 and 30), *Eucalyptus coolabah* (Coolabah) (IDs 39, 40) (Figure 11) and *Eucalyptus largiflorens* (Black Box) (IDs 13, 15, 16, 37) (Figure 12) that are widespread across western NSW, are poorly represented in the protected area system and are threatened by altered flooding regimes, weed invasion and clearing. Only the arid zone River Red Gum community (ID41) could be considered reasonably well protected in reserves such as Mutawintji and Sturt National Parks. Small areas of River Red Gum and Black Box are represented in flora reserves and nature reserves along the Murray and Murrumbidgee Rivers;
- *Callitris glaucophylla* (White Cypress Pine) woodlands on sandy rises and sandplains in central and far western NSW (IDs 28, 48, 69, 70) (Figure 15);
- The restricted *Corymbia tessellaris* (Carbeen) (ID71) (Figure 31) woodland in the Darling Riverine Plains Bioregion;
- Central NSW mallee communities (IDs 173, 174, 193) that have largely been cleared and heavily grazed (Mabbutt 1982);
- *Allocasuarina luehmannii* (Buloke) (Figure 32) and *Callitris gracilis* subsp. *murrayensis* (Slender Cypress Pine) (IDs 19, 20, 21, 22) on source-bordering dunes and other sandy rises in south-western NSW (Sluiter et al. 1997);
- Tussock grasslands including (IDs 43, 44, 45, 47, 49, 50, 52, 214, 215 and 242) (Figs. 33 and 34) are poorly represented in protected areas. Most of these grasslands occur in the wetter, eastern parts of the Western Plains and

Fig. 30. *Eucalyptus camaldulensis* (River Red Gum) tall open forest with *Poa labillardierei* (snow grass) ground cover (ID5) in the Millewa State Forest, Riverina Bioregion. Although much of the original extent of this forest remains, most has been logged resulting in younger age classes. Exotic weeds dominate the ground cover in some locations. Maintaining flooding regimes is critical to the regeneration of River Red Gum forests. Photograph, Jaime Plaza, 10/4/02.

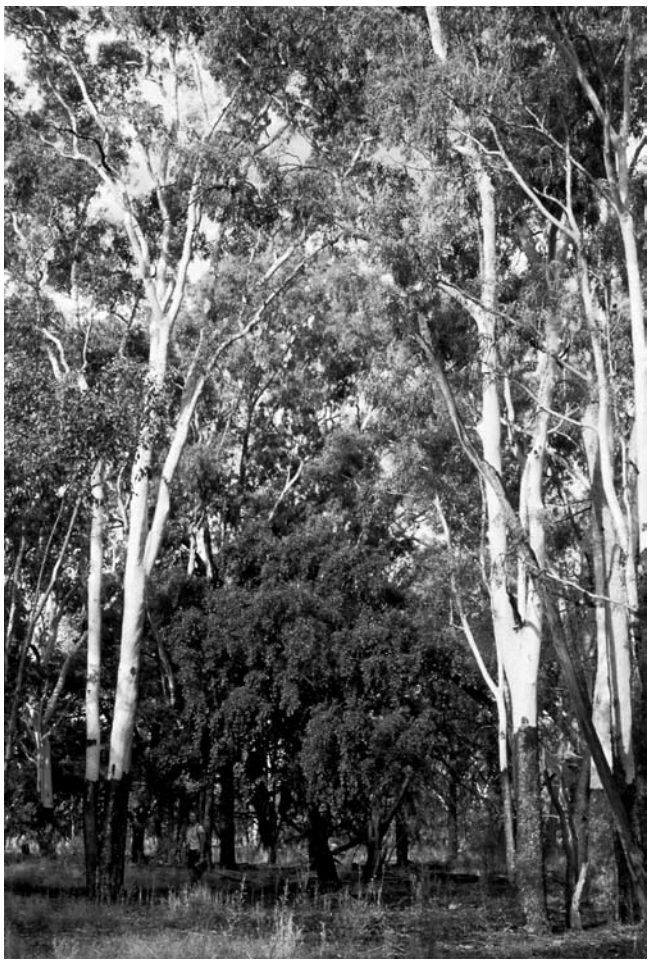

Fig. 31. *Corymbia tessellaris* (Carbeen) woodland (ID71) in the northern NSW wheatbelt. Carbeen occurs on sandy rises or clays on alluvial plains but has largely been cleared and is now restricted to a few locations. Photographer R. Dick, 30/4/86

Fig. 32. *Allocasuarina luehmannii* (Buloke) woodland (ID20) on sandy rises on the Murray River floodplain on the Echuca-Barham Rd in the Riverina Bioregion. This is a highly threatened and restricted community that has mainly been cleared and is lacking regeneration due to grazing pressure from rabbits and domestic stock. Photograph, Jaime Plaza, 11/4/02.

Fig. 33. Forb-rich native grassland dominated by *Danthonia* spp., *Austrostipa* spp., *Chrysocephalum apiculatum*, *Swainsona behriana* and *Wahlenbergia gracilis* (ID44) near Jerilderie in the Riverina Bioregion. Most of the native grasslands in the Riverina have been affected by grazing or cropping. Areas in good condition are mainly restricted to roadsides and stock routes. Photograph M.F. Porteners, 1995.

Fig. 34. Native grassland dominated by *Dichanthium sericeum* (Queensland Bluegrass) and *Astrebla lappacea* (Curly Mitchell Grass) (ID52) on black cracking, clay, alluvial soils in Kirramingly Nature Reserve south-west of Moree. Most of this grassland has been ploughed for crops. The spiny native shrub *Vachellia farnesiana* is abundant in some areas. Photograph, Jaime Plaza, 20/10/01.

have been substantially destroyed by agriculture. In contrast, the Mitchell Grass Grassland of the arid zone (ID61) (Figure 35) is well represented in Sturt National Park.

- Sedge-dominated wetlands or grasslands (IDs 53, 205, 206) in wetland swamps on floodplains (Figure 36). Most inland swamps are threatened by a lack of flooding due to increases in irrigated cropping over the last 40 years.

Future progress of the NSWVCA

Fig. 35. *Astrebla pectinata* (Barley Mitchell grass) grassland with low chenopod shrubs on gibber downs in the arid zone approximately 20km NNW of Tibooburra in the Channel Country Bioregion (ID61). While heavily grazed this community is widespread and well protected in Sturt National Park. Photograph, Jaime Plaza, 25/8/03.

Figure 36. Sedge marsh dominated by *Marsilea drummondii* and *Cyperus eragrostis* near Moomin Creek, Darling Riverine Plains Bioregion (ID53). This community has been affected by clearing and altered flooding regimes but it is also ephemeral and its composition changes depending on the time since last rainfall or flooding. Photograph, Jaime Plaza, 20/10/01.

The classification and data in the NSW Western Plains section of the NSWVCA will evolve over time as knowledge increases and experts deliberate and comment on it. The maintenance of the NSWVCA, including the database, is discussed in Benson (2006).

The next stage (Part 2) of the NSWVCA project will deal with the vegetation of the NSW Western Slopes that abut the NSW Western Plains to the east and include three bioregions: NSW South Western Slopes, Brigalow Belt South and Nandewar. Over 50 plant communities that occur on the Western Plains extend into the western margins of the Western Slopes.

It would be beneficial to complete the classification and assessment of the native vegetation of all eight CMA areas west of the Great Dividing Range because they contain many of the most degraded environments in NSW and Australia. This would require completing the classification and assessment of the vegetation in the NSW Western Slopes and the western part of the NSW Tablelands. The completion of the classification and assessment of the vegetation of all of New South Wales, including the highly diverse vegetation on the coast, will take a commitment of resources and expertise over the next decade.

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References

Note: A bibliography of all references used in the classification and assessment of the vegetation of the NSW Western Plains is in the spreadsheet file *NSW Western Plains Bibliography. xls* in Appendix C of this paper (Part 1 of the NSWVCA) in Folder 3 on the CD in the back pocket of this journal. The references below are those cited in this paper.

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Appendix A.

All Records Full Report of NSW Western Plains plant communities divided into plant communities in 19 Formation Groups, December 2005.

Appendix A is located as a digital file in the Part 1 Western Plains folder in Folder 3 on the CD in the back pocket of the journal. It contains the full descriptions from 90 fields in the NSWVCA database of 213 plant communities classified for the NSW Western Plains. It is about 800 A4 pages in length. Due to its size, the plant communities also are divided into the 19 Formation Groups for the Western Plains. These are arranged as sub-folders in Folder 3 Part 1 NSW Western Plains on the CD.

Appendix B.

All Records Short Report of NSW Western Plains plant communities, December 2005.

Appendix B is located as a digital file in Folder 3, Part 1 Western Plains folder on the CD in the back pocket of the journal. The short report includes 28 of the 90 fields of information in the NSWVDA database. The communities are grouped by alphabetical order of the Formation Groups, then in ID number order within each Group. The full text reference for the reference numbers in the Reference List field can be looked up in Appendix C.

Appendix C.

Bibliography.

A bibliography of the references used to classify the native vegetation of the NSW Western Plains is in the Part 1 Western Plains folder (Folder 3) on the CD in the back pocket of the journal in the MS Excel spreadsheet titled *NSW Western Plains Bibliography.xls* on the CD.

Appendix D

An example of a NSWVCA database full report containing 90 fields of information including full references of a broadly classified plant community with a wide distribution, is critically endangered and is poorly represented in protected areas.

Common Name: **Weeping Myall open woodland of the Riverina and NSW South Western Slopes Bioregions**

Scientific Name: *Acacia pendula/ Rhagodia spinescens –Maireana decalvans / Austrodanthonia caespitosa – Atriplex semibaccata –Alternanthera denticulata –Austrostipa aristiglumis*

Veg. Comm. ID.: **26**

Original Entry: John Benson 31/12/2005

Photo 1: noimage.bmp Acacia pendula woodland,
Lake Urana Nature Reserve, (AGD66) 35°16’09.
8’146°08’32.9’; 9/4/02; J.Plaza.

Photo 2: noimage.bmp Acacia pendula woodland
Grenfell-West Wyalong Road, (AGD66)
33°48'02.1' 147°37'15.9'; 19/4/02; J.Plaza.

Characteristic Vegetation: (Combination of Quantitative Data and Qualitiative Estimate)

Trees: *Acacia pendula; Casuarina cristata; Eucalyptus largiflorens; Eucalyptus camaldulensis subsp. camaldulensis; Eucalyptus melliodora.*

Shrubs/Vines/Epiphytes: *Rhagodia spinescens; Maireana decalvans; Atriplex nummularia; Chenopodium nitrariaceum; Maireana aphylla; Maireana pentagona; Muehlenbeckia florulenta; Acacia stenophylla; Acacia oswaldii; Acacia salicina; Hakea tephrosperma; Santalum lanceolatum; Amyema quandang var. quandang.*

Ground Cover: *Austrodanthonia caespitosa; Atriplex semibaccata; Alternanthera denticulata; Austrostipa aristiglumis; Atriplex spinibractea; Atriplex leptocarpa; Enchylaena tomentosa; Austrostipa nodosa; Austrodanthonia setacea; Sporobolus caroli; Einadia nutans subsp. nutans; Myriocephalus rhizocephalus; Centipeda cunninghamii; Rhodanthe corymbiflora; Vittadinia cuneata var. cuneata f. cuneata; Lepidium pseudohyssopifolium*

Weed Species: *Xanthium occidentale; Echium plantagineum; Medicago polymorpha; Medicago truncatula; Bromus madritensis; Hordeum leporinum; Lolium perenne; Vulpia myuros; Bromus diandrus; Sonchus oleraceus; Trifolium angustifolium; Cotula bipinnata; Hordeum leporinum.*

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

Threatened Plants: Swainsona plagiotropis (E); Swainsonia murrayana (V); Brachyscome chrysoglossa (E); Lepidium monoplocoides (E).

Threatened Fauna: Painted Honeyeater, Superb Parrot.

Mean Species Richness: 39 ± 2 (Lewer et al. 2003 in 20x20 m plots).

Rainforest Structure (Webb): Not applicable.

Structure (WH): Isolated Trees; Open Woodland; Woodland.

Height Class (WH): Low; Mid-High.

Vegetation Description: Mid-high open woodland up to 8 m high dominated by Weeping Myall (Acacia pendula). Other tree species include Belah (Casuarina cristata), while Black Box (Eucalyptus largiflorens) and River Red Gum (Eucalyptus camaldulensis) may occur in depressions. Chenopod shrubs may be common or absent. They include Rhagodia spinescens, Maireana decalvans, Atriplex nummularia, Chenopodium nitrariaceum and Maireana aphylla. The ground cover may be dense or sparse depending on rainfall. It is dominated by grass species such as Austrodanthonia caespitosa, Austrodanthonia setacea, Austrostipa aristiglumis, Austrostipa scabra, Austrostipa nodosa and Sporobolus

caroli. Saltbush species include Atriplex spinibractea, Atriplex leptocarpa and Atriplex semibaccata. Forb species include Alternanthera denticulata, Myriocephalus rhizocephalus, Centipeda cunninghamii, Rhodanthe corymbiflora and Vittadinia cuneata var. cuneata. Occurs on brown clays or loam soils on alluvial plains mainly in the Riverina and NSW South Western Slopes Bioregions of south-western NSW. Apparently extinct in Victoria. Prior to European settlement this community probably contained a dense understorey of saltbush. Much of its original extent has now altered to be a derived native grassland dominated by native grasses and forbs. Weeping Myall is a threatened community due its past extent of clearing and overall is in poor condition.

Level of Classification: Sub-formation.

Classification Confidence Level: High.

Formation Group: Acacia Woodlands and Shrublands of the Inland Slopes and Plains.

State Veg Map (Keith 2004): Riverine Plain Woodlands.

State Landscape (Mitchell 2002): Not Assessed.

NVIS Major Veg Sub-Groups: Other Acacia forests and woodlands.

Forest Type (RN 17): 214 –Wattle (P); 224 –Scrub (P).

Authority(s): (Combination of Expert Opinion and Quantitative Data). Beadle (1948 and 1981) breaks Weeping Myall alliance into north and south communities based on different understorey species composition. This southern community has been mapped on Hay Plain ascommunity 25 by Porteners (1993) and Scott (1992). Map unit 12 in Horner et al. (2002) covering part of the Hay Plain. Moore (1953,1953a) maps it on the south western slopes. Coarsely mapped in Leigh & Mulnam (1977). Eardley (1999) maps Weeping Myall forRiverina Bioregion using RBG mapping and Landsat Satellite Imagery extension mapping. Miles (2001) maps pre-European distribution inMurray catchment. Western Riverina Vegetation Management Committee (2001) map and describe this community. Modelled andmapped in central Lachlan River region by Austin et al. (2001). Map unit R5 in Sivertsen & Metcalfe (1995) in the Forbes and Cargelligoregions. Floristic group 7 and part of map unit ALP3 in Lewer et al. (2003) for the Lachlan River region.

Interstate Equivalent(s): None known. May have occurred in Victoria prior to clearing and may be extinct there.

Mapped/Modelled: Current extent partly mapped.

Plot Sampling: Inadequate.

Mapping Info: Mapable with good quality aerial photographs but Satellite imagery often fails to detect Weeping Myall. Mapped in part around Forbes and Cargelligo (Siversten & Metcalfe 1995), by Porteners (1993) and Horner et al. (2002) for western Riverine Plain. The Jerilderie and Lockhart regions are not yet mapped as of 2003. Some pre-European mapping by Miles (2001) and WRVMC (2001).

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

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

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

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

Local Govt. Areas: Berrigan (1–30%); Bland (1–30%); Carrathool (1–30%); Conargo (1–30%); Coolamon (1–30%); Culcairn (1–30%);Deniliquin (1–30%); Forbes (1–30%); Jerilderie (1–30%); Lachlan (1–30%); Maclean (1–30%); Wagga Wagga (1–30%).

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

MD Basin: Yes.

Substrate Mass: Alluvium.

Lithology: Clay.

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

Soil Texture: Heavy clay; Medium heavy clay; Sandy clay loam.

Landform Patterns: Plain; Rises; Stagnant alluvial plain.

Landform Elements: Plain.

Land Use: Cropping and Horticulture; Grazing.

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

Pre-European Extent: 1 600 000 ha ± 30%. Estimated from pre-European map.

Pre-European Extent Comments: Based on estimates of 1 100 000 ha from pre-European mapping in Western Riverina draft RVM Plan (WRC 2001). This was partly based on mapping of western Riverina by Porteners (1993). Areas occur to the east of this. Miles (2001)estimates that about 500 000 ha of Weeping Myall occurred in the Murray catchment.

Current Extent: 160 000 ha ± 30% or 10% ± 50% of pre-European extent remaining.

Current Extent Comments:(Estimated from a more broadly classified vegetation map). WRVC (2001) estimate that 107 000 ha remains inthe western Riverina. Additional areas are added to this as this community extends to the east of the WRVC area. However, little remainsin the southern/central wheatbelt — only 215 ha is mapped in the Forbes area. Horner et al. (2002) map over 11 000 ha on part of the HayPlain.

Conservation Reserves: Lake Urana NR 10 (E3); Oolambeyan NP 715 (M).

Reserves Total Area: 725 ha.

No. Representatives in Reserves: 2

Protected Area Explanation: No large areas are known to be reserved as of 2001. Areas in Oolamebeyan National Park mapped by Roberts & Roberts (2001). A small patch occurs in Lake Urana NR (NPWS 2001a and Benson 1999–2004). Porteners (1993) mappedareas that warrant investigation. PA DE9905 from overlaying Porteners (1993).

Secure Property Agreements: DE9905 PA 88 (M).

Secure PAs Total Area: 88 ha.

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

Protected Current Extent: 0.5% 813 ha ± 10%.

No. Representatives in Protected Areas: 3

Protected Pre-European Extent: 0.05% 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 report by Eardley (1999) for the Riverina Bioregion highlights areas of potential conservation importance for arange of vegetation communities. Regions north of Jerilderie may be important.

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

Variation & Disturbance: Much of the present Austrodanthonia grasslands of the Riverina may have been derived from a pre-European Acacia pendula — Atriplex nummularia woodland/shrubland. The chenopods, and presumably Weeping Myall, were eliminated from vast regions through a combination of clearing and over-grazing.

Fire Regime: Unknown — occasional wildfire sweeps across the plains — an extensive fire burnt part of the Riverina in 1991. This resultedin the mass germination of Swainsona and other legume species. Presumably, the seed of Acacia pendula is long-lived and maygerminate after fire.

Adjoining Communites: Grades into grassland, Bladder Saltbush, White Cypress Pine or Buloke communities and Black Box along creeks or in depressions.

Threatening Processes: A critically endangered and very poorly reserved community. Mostly cleared for grazing and crops in the southern wheatbelt and in the Riverina. Existing remnants threatened by further clearing. Continuous grazing by stock and rabbits have altered the understorey.

Threatening Process List: Clearing for agriculture; Dryland cropping; Irrigated cropping; Major impacts on structure due to logging; Salinity; Unsustainable grazing and trampling by stock; Unsustainable grazing by feral animals; Weed (exotic) invasion.

Threat Category: Critically Endangered.

Threat/Protected Area Code: CE/5a

Threat Criteria:1; 4; 5.

Planning Controls: Listed TSC Act

Planning and Management: The Lachlan, Murrumbidgee and Murray Catchment Management Plans should protect what remains of this community. No more clearing of this community should be allowed under these plans and some areas should be encouraged to regrow through fencing schemes.

Listed Under Legislation: Listed TSCA (NSW Threatened Species Conservation Act); Nominated EPBCA (Com. Environmental Protection

Recovery Plan: Doesn't exist, but required.

Reference List: (183; 73; 3; 308; 16; 289; 145; 293; 293; 67; 246; 166; 144; 14; 247; 13; 34; 146). 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. (1948) The vegetation and pastures of western New South Wales. (NSW Department of Conservation: Sydney); Beadle, N.C.W. (1981) The vegetation of Australia. (Cambridge University Press: Cambridge); Benson, J.S. (1999–2005) Unpublished field note books recording species at various locations in western NSW. (Royal Botanic Gardens and Domain Trust: Sydney); Eardley, K.A. (1999) A foundation for conservation in the Riverina Bioregion. Unpublished Report. (NSW National Parks and Wildlife Service); Horner, G., McNellie, M., Nott, T.A., Vanzella, B., Schliebs, M., Kordas, G.S., Turner, B. & Hudspith, T.J. (2002) Native vegetation map report series: No. 2 Dry Lake, Oxley, Hay, One Tree, Moggumbill & Gunbar 1:100 000 map sheets. (NSW Department of Infrastructure Planning and Natural Resources: Sydney); Leigh, J.H. And Mulham, W.E. (1977) Vascular plants of the Riverine Plain of New South Wales with notes on distribution and pastoral use. Telopea 1(4): 225–291; 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; 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; 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; Moore, C.W.E. (1953b) The vegetation of the south-eastern Riverina, New South Wales 2: the disclimax communities. Aust. J. Botany 1: 548–567; 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; Roberts, I. & Roberts, J. (2001) Plains Wanderer (Pedionmus torquatus) habitat mapping, including woody vegetation and other landscape features Riverina Plains NSW. Report to NSW National Parks and Wildlife Service. (Earth Resources Analysis Pty. Ltd.); Scott, J.A. (1992) The natural vegetation of the Balranald -Swan Hill area. Cunninghamia 2(4): 597–652; 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).

Appendix E

An Example of a NSWVCA database Short Report with 28 fields of information for a plant community that is widespread, has a threat status of Least Concern and is well represented in protected areas.

Common Name: **Spinifex linear dune mallee mainly of the Murray-Darling Depression Bioregion**

Scientific Name: *Eucalyptus socialis –Eucalyptus dumosa —Eucalyptus gracilis —Eucalyptus costata / Acacia colletioides —Dodonaea viscosa subsp. angustissima —Eremophila glabra / Triodia scariosa subsp. scariosa —Vittadinia cuneata —Austrostipa nitida*

Veg. Comm. ID.: **171**

Photo 1: ID171 Eucalyptus socialis—Eucalyptus dumosa linear dune mallee shrubland, Tarawi Nature Reserve, (AGD66) 33°24'06.6' 141°18' 09.6'; 14/4/02; J.Plaza.

Original Entry: 31/12/2005 John Benson

Characteristic Trees: *Eucalyptus socialis; Eucalyptus dumosa; Eucalyptus gracilis; Eucalyptus costata; Callitris verrucosa; Eucalyptus leptophylla; Eucalyptus oleosa.*

Shrubs/Vines/Epiphytes: *Acacia colletioides; Dodonaea viscosa subsp. angustissima; Eremophila glabra; Eremophila sturtii; Olearia pimeleoides; Maireana pentatropis; Acacia wilhelmiana; Senna form taxon 'filifolia'; Bossiaea walkeri; Chenopodium curvispicatum; Grevillea huegelii; Eutaxia microphylla; Dodonaea bursariifolia; Beyeria opaca; Exocarpos sparteus; Alectryon oleifolius subsp. canescens; Westringia rigida; Acacia brachybotrya; Acacia sclerophylla var. sclerophylla; Capparis lasiantha; Maireana triptera.*

Groundcover: *Triodia scariosa subsp. scariosa; Vittidinia cuneata; Austrostipa nitida; Sclerolaena diacantha; Enchylaena tomentosa; Sclerolaena parviflora; Chenopodium desertorum subsp. desertorum; Halgania cyanea; Vittadinia cuneata; Lomandra effusa; Atriplex stipitata; Ptilotus exaltatus var. exaltatus; Sclerolaena obliquicuspis; Podolepis capillaris; Lomandra leucocephala subsp. leucocephala; Chenopodium desertorum subsp. anidiophyllum.*

Structure (WH): Mallee Shrubland; Open Mallee Shrubland.

Vegetation Description: Mallee shrubland or open shrubland most about 5 m tall but up to 8 m, most often in a whipstick habit, dominated by a number of mallee species including White Mallee (Eucalyptus dumosa), Red Mallee (Eucalyptus socialis) and Snap and Rattle (Eucalyptus gracilis) and Ridge-fruited Mallee (Eucalyptus costata). Narrow-leaved Red Mallee (Eucalyptus leptophylla) is also often present along with Sand Dune Pine (Callitris verrucosa). This community

contains a species-rich understorey that is dominated by Porcupine Grass (Triodia scariosa). A mid-dense to sparse shrub cover includes Acacia colletioides, Dodonaea viscosa subsp. angustissima, Eremophila glabra, Olearia pimelioides, Maireana pentratropis, and Grevillea huegeilii. Mulga (Acacia aneura) and Wilga (Geijera parviflora) may occur in northern and eastern areas. Besides Porcupine Grass, the ground cover includes fuzz-weed (Vittadinia cuneata), Austrostipa nitida, Podolepis capillaris and copperburrs such as Sclerolaena diacantha and Sclerolaena obliquicuspis. After rainfall many ephemeral species germinate including daisies and other forbs. Weeds are low in number and cover but Onion Weed (Asphodelus fistulosus) can be a localised problem. The swales between the dunes are most often more loamy-clay and often contain different vegetation such as belah or box woodlands. This community occurs on calcareous brown-red sand or loamy sand sometimes overlying grey clay on east-west linear sand dunes mainly in the Murray-Darling Sands Bioregion in south far western plain of NSW extending into South Australia and Victoria. Mainly restricted to the arid zone and semi-arid (warm) climatic zones in NSW. In relatively good condition compared to most other inland plant communities due to a low proportion having been cleared and low stocking rates. Rabbits are a problem in some areas. Burnt by wildfires every two or three decades or more regularly by landholders. Frequent fire may threaten the survival of mallee species.

IBRA (v6): Murray-Darling Depression (>70%).

CMAs: Lachlan (1–30%); Lower Murray/Darling (>70%); Western (1–30%).

Pre-European Extent: 800 000 ha ± 30%.

Current Extent: 650 000 ha ± 30%.

Percent Remaining: 81% ± 50%.

Conservation Reserves: TOTAL AREA 66893 ha: Mallee Cliffs NP 17300 (E2); Mungo NP 6000 (E2); Nombinnie NR 250 (E1);Nombinnie SCA 200 (E1); Round Hill NR 143 (M); Tarawi NR 9000 (E1); Yathong NR 34000 (E2).

Secure Pty. Agreements: TOTAL AREA 36680 ha: Nanya Ballarat Uni VCA 10530 (E1); Scotia AWC VCA 26150 (E1).

Protected Current: TOTAL AREA 103573 ha (15.93%) ± 30%, or 12.94% of pre-European extent.

Threat Category: Least Concern.

Threat/Protected Area Code: LC/3a.

Threat Criteria: 4; 1.

Reference List: 39; 282; 12; 216; 17; 43; 25; 13; 244; 33; 41; 232; 78.

Appendix F

This is located in Folder 3 on the CD accompanying this journal. It is a spreadsheet listing of the 213 plant communities in the NSW Western Plains by ID number and common name with their threat code, protected area code, current extent, pre-European extent proportion of extent in protected areas compared to estimated pre-European extent, occurances in CMA areas, occurence in bioregions. The spreadsheet format facilitates ordering the plant communities by threat code, protected area status or percentage in protected areas.