

Carbeen Open Forest community in the Darling Riverine Plains and Brigalow Belt South bioregions

Introduction

These guidelines provide background information to help land managers to identify remnants of the Endangered Ecological Community (EEC): Carbeen Open Forest community in the Darling Riverine Plains and Brigalow Belt South bioregions. For more detailed information refer to the EEC Profile for Carbeen Open Forest, which includes the Final Determination of the NSW Scientific Committee, on the Department of Environment, Climate Change and Water (DECCW) Threatened Species website: www.threatenedspecies.environment.nsw.gov.au

What is an Endangered Ecological Community?

An ecological community is a unique and naturally occurring assemblage of plants and animals. The presence of an ecological community can be determined by factors such as soil type, position in the landscape, climate and water availability, all of which influence species composition. An EEC is an ecological community listed under the *Threatened Species Conservation Act 1995* as being at risk of extinction, unless the threats affecting it are managed and reduced.

Although most ecological communities are recognised by their typical plant species, these communities include all the organisms that occur in that particular area. The survival of each species relies on complex interactions among all of the inhabitants of an ecological community, through biotic mechanisms such as food webs, mutualisms and pollination, and through abiotic mechanisms such as water, nitrogen and carbon cycles. Consequently, the loss of any species may have detrimental flow-on effects for the ecological functioning of the whole community.



Carbeen (*Corymbia tessellaris*)
Photo: T. M. Tame

What is a particular area?

The NSW Scientific Committee defines a particular area as the Bioregion and Local Government Area where an EEC may be found. The particular area may be further delineated by using other supplementary factors such as landscape, soil type and climatic variables.

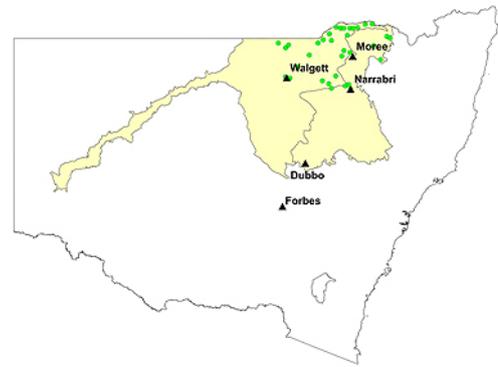
What is a Carbeen Open Forest EEC?

Carbeen Open Forest is a distinctive plant community recognised by remnant trees or a woodland dominated by carbeen (*Corymbia tessellaris*) and white cypress pine (*Callitris glaucophylla*). Associated trees include long-fruited bloodwood (*Corymbia dolichocarpa*), poplar box (*Eucalyptus populnea* subsp. *bimbil*), belah (*Casuarina cristata*) and bullock (*Allocasuarina luehmannii*). River red gum (*Eucalyptus camaldulensis* subsp. *camaldulensis*)

also occurs in low-lying areas. The structure of this community was previously an open forest, but extensive clearing and grazing disturbances have reduced it to a mid-high or tall woodland of isolated remnant stands. The canopy is open to moderately dense, with sparse to well-developed shrub understorey and groundcover of low shrubs, grasses and forbs. See 'Identifying the Carbeen Open Forest EEC' below for further help.

Where is the Carbeen Open Forest found?

Carbeen occurs on the floodplains of the Meehi, Gwydir, Namoi, MacIntyre and Barwon rivers of north-western NSW (see Map). It is found on flats and gentle rises of alluvial or aeolian sandy soils derived from ancient watercourses (it also occurs on some clay alluvial soils but is mostly restricted to well-drained sandy sites). These rises or lenses are remnants of prior streams and are often distant from the existing rivers. In NSW, Carbeen Open Forest is distributed from south of Moree to west of the Barwon River, extending east to just inside the Nandewar Bioregion. It is recorded from the Local Government Areas of Moree Plains, Walgett, Brewarrina and Inverell. Carbeen reaches its southern limit in NSW and is more common in Queensland, where it extends into north-coastal regions as an associate in a variety of plant communities.



The bioregions in NSW where Carbeen Open Forest EEC occurs and the locations where carbeen as a species has been recorded to date. The Carbeen EEC occurs elsewhere in the bioregions.

Description of the community

The tree layer

The tree or upper canopy layer of the Carbeen Open Forest is dominated by *C. tessellaris*, growing with a range of other tree species, commonly white cypress pine (*C. glaucophylla*) and sometimes long-fruited bloodwood (*C. dolichocarpa*), white bloodwood (*C. trachyphloia* subsp. *amphistomatica*), poplar box (*E. populnea* subsp. *bimbil*), angophora (*Angophora leiocarpa*), dirty gum (*E. chloroclada*), belah (*C. cristata*) or bullock (A. *luehmannii*). River red gum (*E. camaldulensis* subsp. *camaldulensis*) occurs in low lying areas.

The understorey: small trees and shrubs

A small tree or shrub layer is often present and includes wilga (*Geijera parviflora*), quinine bush (*Alstonia constricta*), western rosewood (*Alectryon oleifolius* subsp. *canescens*), whitewood (*Atalaya hemiglauca*), bitter bark (*Petalostigma pubescens*), cooba (*Acacia salicina*), ironwood (*Acacia excelsa*), mimosa bush (*Acacia farnesiana*), budda (*Eremophila mitchellii*), eurah (*Eremophila bignoniiflora*) and wild orange (*Capparis mitchellii*).



Carbeen (*Corymbia tessellaris*) Open Forest on a sandy rise in the northern wheatbelt of NSW. Photo: R. Dick

Table 1. Characteristic species recorded in the Carbeen Open Forest EEC

Common name	Scientific name	Common name	Scientific name
Overstorey – tree or shrub layer species (1.5 m+)		Cut-leaf peppergrass	
Ironwood ⁺	<i>Acacia excelsa</i>	African boxthorn	<i>Lycium ferocissimum</i> *
Mimosa bush ⁺	<i>Acacia farnesiana</i>	Eastern cottonbush	<i>Maireana microphylla</i>
Cooba ⁺	<i>Acacia salicina</i>	Water bush	<i>Myoporum montanum</i>
River cooba	<i>Acacia stenophylla</i>	Common prickly pear	<i>Opuntia stricta</i> var. <i>stricta</i> *
Western rosewood ⁺	<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	Sandhill rice-flower	<i>Pimelea pencillaris</i>
Bullock ⁺	<i>Allocasuarina luehmannii</i>	Showy copper-wire daisy	<i>Podolepis jaceoides</i>
Quinine bush ⁺	<i>Alstonia constricta</i>	Turnip weed	<i>Rapistrum rugosum</i> *
Angophora ⁺	<i>Angophora leiocarpa</i>	Thorny saltbush ⁺	<i>Rhagodia spinescens</i>
Whitewood ⁺	<i>Atalaya hemiglauca</i>	Galvanised burr ⁺	<i>Sclerolaena birchii</i>
Wild orange ⁺	<i>Capparis mitchellii</i>	Black roly-poly	<i>Sclerolaena muricata</i> var. <i>semiglabra</i>
White cypress pine ⁺	<i>Callitris glaucophylla</i>	Potato bush	<i>Solanum ellipticum</i>
Belah ⁺	<i>Casuarina cristata</i>	Lilac darling pea	<i>Swainsona phacoides</i>
Long-fruited bloodwood ⁺	<i>Corymbia dolichocarpa</i>	Broughton pea	<i>Swainsona procumbens</i>
Carbeen ⁺	<i>Corymbia tessellaris</i>	Fuzzweed	<i>Vittadinia dissecta</i> var. <i>hirta</i>
White bloodwood ⁺	<i>Corymbia trachyphloia</i> subsp. <i>amphistomatica</i>	Fuzzweed	<i>Vittadinia sulcata</i>
Eurah ⁺	<i>Eremophila bignoniiflora</i>	Herbs / ferns	
Budda ⁺	<i>Eremophila mitchellii</i>	Australian bugle	<i>Ajuga australis</i>
River red gum ⁺	<i>Eucalyptus camaldulensis</i> subsp. <i>camaldulensis</i>	Tarvine	<i>Boerhavia dominii</i>
Dirty gum ⁺	<i>Eucalyptus chloroclada</i>	Variable daisy	<i>Brachyscome ciliaris</i> var. <i>ciliaris</i>
Poplar box ⁺	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Native carrot	<i>Daucus glochidiatus</i>
Wilga ⁺	<i>Geijera parviflora</i>	Kidney weed	<i>Dichondra</i> species A
Beefwood	<i>Grevillea striata</i>	Common cudweed	<i>Euchiton sphaericus</i>
Bitter bark ⁺	<i>Petalostigma pubescens</i>	Evolvulus	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>
Wild lemon	<i>Psyrax oleifolium</i> (formerly <i>Canthium oleifolium</i>)	Burr medic	<i>Medicago polymorpha</i> *
Pepper tree	<i>Schinus areira</i> *	Wood sorrel	<i>Oxalis chnoodes</i>
Supplejack	<i>Ventilago viminalis</i>	Grasses / sedges	
Groundcover/understorey species (0-1.5 m)		Dark wiregrass ⁺	<i>Aristida calycina</i>
Shrubs / forbs		Wiregrass	<i>Aristida platychaeta</i>
Flannel weed ⁺	<i>Abutilon oxycarpum</i>	Purple wiregrass	<i>Aristida ramosa</i>
Sandhill wattle	<i>Acacia ligulata</i>	Slender bamboo grass	<i>Austrostipa verticillata</i>
Khaki weed	<i>Alternanthera pungens</i> *	Pitted bluegrass	<i>Bothriochloa decipiens</i>
Purple burr-daisy	<i>Calotis cuneifolia</i>	Innocent weed	<i>Cenchrus longispinus</i> *
Burr-daisy	<i>Calotis dentex</i>	Windmill grass ⁺	<i>Chloris truncata</i>
Yellow burr-daisy	<i>Calotis lappulacea</i>	Trim flat-sedge	<i>Cyperus concinnus</i>
Tufted burr-daisy	<i>Calotis scapigera</i>	Flat-sedge	<i>Cyperus gracilis</i>
Desert goosefoot	<i>Chenopodium desertorum</i> subsp. <i>desertorum</i>	Flat-sedge	<i>Cyperus leiocaulon</i>
Black crumbweed	<i>Chenopodium melanocarpum</i>	Silky umbrella grass	<i>Digitaria ammophila</i>
Clustered everlasting	<i>Chrysocephalum semipapposum</i>	Cotton panic grass	<i>Digitaria brownii</i>
Darling lily ⁺	<i>Crinum flaccidum</i>	Purple lovegrass	<i>Eragrostis lacunaria</i>
Black orchid ⁺	<i>Cymbidium canaliculatum</i>	Curly windmill grass	<i>Enteropogon acicularis</i>
Climbing saltbush ⁺	<i>Einadia nutans</i> subsp. <i>eremaea</i>	Early spring grass	<i>Eriochloa pseudoacrotricha</i>
Ruby saltbush	<i>Enchylaena tomentosa</i>	Rush	<i>Juncus remotiflorus</i>
Rough raspwort	<i>Haloragis heterophylla</i>	Long-leaved wallaby grass	<i>Notodanthonia longifolia</i>
Native jasmine	<i>Jasminum lineare</i>	Native millet ⁺	<i>Panicum decompositum</i>
Purple running pea	<i>Kennedia procurrans</i>	Two-colour panic	<i>Panicum simile</i>
		Box grass	<i>Paspalidium constrictum</i>
		Slender panic	<i>Paspalidium gracile</i>
		Warrego grass	<i>Paspalidium jubiflorum</i>
		Small burr-grass	<i>Tragus australianus</i>

Key indicator species from Final Determination are marked ⁺ (diagnostic species in **BOLD**); Weed species are marked *; Common names are as per Royal Botanic Gardens, see: <http://plantnet.rbg.gov.au>
Additional species from Benson (2009) and Northern Floodplains Regional Planning Committee (2004) (see references).

The understorey: groundcover plants

Groundcover species that are common across the range of Carbeen Open Forest EEC include low chenopod shrubs such as galvanised burr (*Sclerolaena birchii*), thorny saltbush (*Rhagodia spinescens*) and climbing saltbush (*Einadia nutans* subsp. *eremaea*); grasses such as purple wiregrass (*Aristida ramosa*), dark wiregrass (*Aristida calycina*), native millet (*Panicum decompositum*), purple lovegrass (*Eragrostis lacunaria*), pitted bluegrass (*Bothriochloa decipiens*), Warrego grass (*Paspalidium jubiflorum*), windmill grass (*Chloris truncata*), rough speargrass (*Austrostipa scabra* subsp. *scabra*) and slender bamboo grass (*Austrostipa verticillata*); and native forbs such as flannel weed (*Abutilon oxycarpum*), Darling lily (*Crinum flaccidum*), purple burr-daisy (*Calotis cuneifolia*), yellow burr-daisy (*Calotis lappulacea*) and tarvine (*Boerhavia dominii*).

Characteristic species list

There are a number of variations in floral composition and structure within this community throughout its range, and in some individual cases the species in Table 1 may occur infrequently or not at all. Unseen species may be represented below ground in the soil seed bank or as dormant structures such as bulbs, corms, rhizomes, rootstock or lignotubers. Your final decision should be based on the weight of evidence from the key indicators outlined below. If in doubt refer to the full NSW Scientific Committee Determination or seek further assistance from DECCW or your local catchment management authority.

Identifying the Carbeen Open Forest EEC

The following are key indicators to look for when determining whether Carbeen Open Forest EEC exists on a site:

1. Is the site located in the Darling Riverine Plains or Brigalow Belt South bioregion, on the floodplains of the Meehi, Gwydir, Namoi, MacIntyre or Barwon Rivers?
2. Is the site on a gentle rise or lens composed of alluvial siliceous sands, earthy sands or clayey sands, derived from a prior stream or ancient watercourse?
3. Is the site a woodland or open forest dominated by carbeen, with a sparse or well-developed low shrub understorey and/or open forb and grass groundcover?
4. Does the site contain a combination of the diagnostic tree species marked in bold in Table 1?
5. Does the site contain river red gum on low-lying areas that have shallow watertables?
6. Are there any plant species present at the site that are listed as characteristic in Table 1? (See photos in this guideline, check with a local botanist, consult reference books or NSW Flora Online: <http://plantnet.rbgsyd.nsw.gov.au/>).

If you answered yes to the above questions your site is likely to consist of Carbeen Open Forest EEC.



Carbeen Open Forest grassy woodland on floodplain, 21 km west of Wee Waa
Photo: D. Robson



Carbeen (*Corymbia tessellaris*)
Photo: T. M. Tame



Carbeen Open Forest with representative carbeen trunk in the foreground. Photo: M. Pennay

What does this mean for my property?

As an EEC listed under the *Threatened Species Conservation Act 1995*, Carbeen Open Forest has significant conservation value and some activities affecting the EEC may require consent or approval. Please contact the Department of Environment, Climate Change and Water or your local catchment management authority for further information.

EECs that may adjoin or intergrade with Carbeen EEC

This community would have previously occurred with the following other western slopes and plains vegetation types that are now also listed as EECs:

1. *Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains bioregions*, on adjacent alluvial plain and floodplain landscapes;
2. *Coolibah–Black Box Woodlands of the northern riverine plains in the Darling Riverine Plains and Brigalow Belt South bioregions*, primarily on floodplains in the west of its range.

Determining the conservation value of remnants

The degree of disturbance (i.e. the site condition) of any remnant of Carbeen Open Forest EEC may vary depending on past land use, management practices and/or natural disturbance, and this should be considered at the time of assessment. Although the following list is not exhaustive, it describes a number of variations of the Carbeen Open Forest EEC you may encounter on your land:

1. as isolated small stands or remnant trees within heavily cleared agricultural country
2. modified sites where carbeen and its associated trees are present but the understorey and ground layer are depauperate, predominantly composed of exotic species with few native grasses, forbs or shrubs remaining
3. remnants of carbeen that have been subjected to clearing, overgrazing or other disturbance in the past may form a modified open woodland instead of original open forest structure
4. sites that may have considerable floristic variation across their range, with grass species dominating the understorey on clay soils and shrubs being more prevalent on sandier soils
5. dominance of white cypress pine regrowth at sites where logging has occurred in the past
6. incursions of weeds such as buffel or burr grasses (*Cenchrus* species), tiger pear (*Opuntia aurantiaca*), common prickly pear (*Opuntia stricta* var. *stricta*), African boxthorn (*Lycium ferocissimum*) or turnip weed (*Rapistrum rugosum*).

The conservation significance of each remnant should be assessed at each site, noting that even where a remnant is considered to be heavily degraded and in poor condition, it may still have conservation value for a number of reasons, including:

1. as part of a wildlife corridor that has connective importance at local and/or regional scales;
2. as an important habitat and food source for birds, small and large mammals, terrestrial invertebrates and insectivorous bats;
3. containing threatened species of flora in their own right, such as the Endangered shrubs *Sida rohlenae* and narrow-leaf bumble *Capparis loranthifolia* var. *loranthifolia*; or the restricted purple running pea *Kennedia procurrens*;
4. because it maintains a healthy native seed bank, which is crucial for the perpetuation of vegetation communities and individual species in highly cleared and fragmented landscapes

Any native vegetation remnant has habitat value and contributes to local and regional biodiversity. It is important to take these factors into account when determining the conservation significance of remnants.



Carbeen (*Corymbia tessellaris*), Narrabri
Photo: T. M. Tame

For further help

This and other EEC guidelines are available on the DECCW website at threatenedspecies.environment.nsw.gov.au/tsprofile/home_tec.aspx or www.environment.nsw.gov.au/pnf/eecfieldidguidelines.htm

The resources listed below also provide information on NSW plants, native vegetation and EECs.

- Botanic Gardens Trust plant identification help: www.rbgsyd.nsw.gov.au/plant_info/identifying_plants/
- Department of Environment, Climate Change and Water threatened species profiles: www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_species.aspx
- information on bioregions of New South Wales (determinations use IBRA version 4 boundaries): www.environment.nsw.gov.au/bioregions/Bioregions.htm
- NSW Scientific Committee determinations: www.environment.nsw.gov.au/committee/ListofScientificCommitteeDeterminations.htm
- Benson, J.S. (2009) New South Wales Vegetation Classification and Assessment: Part 2. Plant communities of the NSW South-western Slopes Bioregion and update of the NSW Western Plains plant communities, Version 2 of the NSWVCA database: *Carbeen–White Cypress Pine–River Red Gum–bloodwood tall woodland on alluvial and aeolian soils in the BBS and DRP Bioregions*. *Cunninghamia* 10(4): 599–673.
- Northern Floodplains Regional Planning Committee (2004) *Vegetation Communities of the Northern Floodplains Western New South Wales. Book 2: Brewarrina Shire, April 2004. Vegetation Communities: Pine / Carbeen / River Red Gum (PCR)* (Northern Floodplains Regional Planning Committee: Walgett).
- NSW Scientific Committee (1999) *Carbeen Open Forest community within the Darling Riverine Plains and Brigalow Belt South bioregions–Endangered Ecological Community Listing–Final Determination* (NSW NPSW: Sydney).

Published by:
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ISBN 978 1 74232 995 6
DECCW 2010/918
November 2010



Carbeen (Corymbia tessellaris) – white cypress pine (Callitris glaucophylla) – white box (Eucalyptus albens) tall open forest in Killarnay State Conservation Area north of Narrabri Photo: J. Plaza, RBG