

Australian Government

Department of the Environment, Water, Heritage and the Arts



Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

A guide to identifying and protecting the nationally threatened ecological community Environment Protection and Biodiversity Conservation Act 1999 Policy Statement 3.31

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CONTENTS

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WHAT IS THE PURPOSE OF THIS GUIDE?	2
NATIONALLY THREATENED ECOLOGICAL COMMUNITIES	3
What is a nationally threatened ecological community?	3
Why does the Australian Government list threatened ecological communities?	3
Why list the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest as critically endangered?	4
THE CUMBERLAND PLAIN SHALE WOODLANDS AND SHALE-GRAVEL	
TRANSITION FOREST	5
What is the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest?	5
Where is it found?	6
How do I know if I am standing in a patch of the ecological community?	8
Key diagnostic features and condition thresholds decision flowchart	8
Snapshot: Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	12
Is the listed ecological community known by other names?	14
Other considerations to help with assessment	16
KEY SPECIES	17
Species of special importance	21
WHAT DOES THE LISTING MEAN FOR APPROVAL AUTHORITIES OR LAND	
MANAGERS?	23
MANAGING THREATS AND PRIORITY CONSERVATION ACTIONS	25
Is funding available to protect the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest?	27
WHERE CAN I GO FOR FURTHER INFORMATION?	28

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Acacia implexa (hickory wattle)

WHAT IS THE PURPOSE OF THIS GUIDE?

This guide is designed to help land managers, environmental assessment officers and the general public to: identify a nationally listed ecological community, the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest; understand the implications of its listing (protection) as critically endangered under Australia's national environment law—the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act); and understand how to help with its protection, and recovery.

This document accompanies the listing advice, which presents a definitive and more detailed description of this critically endangered ecological community. The listing advice, and other information on the ecological community, can be found in the Australian Government's species profile and threats database (SPRAT) at: www. environment.gov.au/cgi-bin/sprat/public/ publiclookupcommunities.pl

Click on the 'details' link next to the name of the ecological community.

This policy statement does not provide specific advice on whether particular actions will trigger national environment law by having a significant impact on the ecological community. This needs to be considered on a case and site specific basis. However, minimum condition thresholds are specified that a patch of the ecological community must meet for national law protection. Additional environment assessment considerations are also covered on page 16.

General guidance on significant impacts is found separately at: www.environment.gov. au/epbc/publications/nes-guidelines.html

For what this listing means for approval authorities or land managers, see page 23.



Brunoniella australis (blue trumpet)



Asperula conferta (common woodruff)

NATIONALLY THREATENED ECOLOGICAL COMMUNITIES

What is a nationally threatened ecological community?

An ecological community is a naturally occurring group of plants, animals and other organisms that interact in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, climate and water availability. Threatened ecological communities are important because of their unique biodiversity and landscape values, and for the ecosystem services they provide. These include the natural management of air, water and soil nutrients; the reduction or control of erosion and salinity; and carbon storage.

In addition, threatened ecological communities are a form of landscape or systems level protection. They provide vital wildlife corridors and habitat refuges for many plant and animal species, including threatened species and other Australian plants and animals that are in decline. Their natural values also contribute to the tourism and recreation industries and the productivity of farmlands in the agricultural sector.

Why does the Australian Government list threatened ecological communities?

The Australian Government is responsible for identifying and protecting matters of national environmental significance through the EPBC Act. These include world heritage properties, national heritage places, internationally important wetlands (Ramsar wetlands), listed migratory species, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions and nationally threatened species and ecological communities.

Protection through the EPBC Act complements other conservation measures, and is particularly vital for many species and ecological communities that occur outside conservation reserves.

The national listing of ecological communities follows a rigorous and transparent assessment process that involves consultation with stakeholders and the public, and workshops and discussions with scientific experts, culminating in advice from the Threatened Species Scientific Committee. This committee is an





Burhinus grallarius (bush stone curlew)

independent scientific body that advises the federal environment minister on the conservation of native species and ecological communities. Listing ecological communities recognises that their long-term survival is under threat. The aim of listing is to prevent further decline and to promote and help recovery through landholder and community efforts. More information on nationally threatened ecological communities and species can be found at: www.environment. gov.au/biodiversity/threatened/index.html

Why list the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest as critically endangered?

The ecological community was previously listed as nationally endangered under the name Cumberland Plain Woodlands. The listing was re-assessed by the Threatened Species Scientific Committee, which recommended that the conservation status of the ecological community be revised to critically endangered. The committee also clarified which local vegetation types correspond with the national ecological community, and recommended a new name for the revised national ecological community.

Following advice from the committee, the federal environment minister listed the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest as a critically endangered ecological community in December 2009. The advice indicated that this ecological community is critically endangered because it has a very restricted distribution, faces significant ongoing threats, and has undergone a very severe reduction in its integrity. The committee also found that the ecological community had undergone a severe decline in its extent and that it was experiencing a substantial rate of continuing detrimental change.

In New South Wales the national ecological community is listed as two separate threatened ecological communities under the *Threatened Species Conservation Act 1995:* Cumberland Plain Woodland in the Sydney Basin Bioregion; and Shale-Gravel Transition Forest in the Sydney Basin Bioregion (see *Is the listed ecological community known by other names?* on page 14).

Before European settlement, the Sydney region was covered by a range of forest, woodland and heathland ecological communities. The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest was the most common type of native vegetation in the area now occupied by western Sydney, including towns such as Blacktown, Campbelltown, Camden, Fairfield, Liverpool, Penrith, Richmond and Windsor. As a consequence of threats such as clearing and weed invasion, the ecological community is now restricted to relatively small and fragmented bushland patches nestled among a largely urban to peri-urban environment.

The revised listing will stimulate further public awareness about the ecological community. It will also clarify what is protected under the EPBC Act and ensure it continues to be a priority for funding in land-use decisions and management actions to recover and conserve native bushland in the western Sydney region.

THE CUMBERLAND PLAIN SHALE WOODLANDS AND SHALE-GRAVEL TRANSITION FOREST

What is the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest?

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest lies in a coastal valley rain shadow that occupies the driest part of the Cumberland Plain. It typically occurs on flat to undulating or hilly terrain, at elevations up to about 350 m above sea level, and on clay soils (derived from Wianamatta Group shales), with some occurrences on other soils. Annual rainfall in the region typically lies within the range of 700-900 mm. This ecological community has several vegetation layers in its natural state. The tree canopy is typically dominated by Eucalyptus moluccana (grey box), E. tereticornis (forest red gum), and/or E. fibrosa (red ironbark). Other canopy species may occur in association with the typical dominants and may be locally dominant at some sites, depending on local variation in the landscape. Smaller trees and shrubs grow underneath the tree canopy. The vegetation on the ground is a mix of grasses and herbs.

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest has great importance in the landscape, being a key example of a coastal grassy woodland and nationally unique. The preservation of woodland remnants, such as the ecological community, will contribute to native vegetation corridors that will improve quality of life as the area becomes increasingly urbanised. It will also help to maintain valuable connectivity among native vegetation remnants that are essential to retain the fauna that live or migrate through the region. For example, birds and bats, including some threatened species, use the ecological community to move from north to south through western Sydney and beyond, and from east to west across the Great Dividing Range to the coast, as seasons change.





Micromyrtus minutiflora

Where is it found?

The known distribution of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is shown in the map on page 7. It was formerly extensive across the Cumberland Plain, but now occurs as mostly small patches.

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is endemic to New South Wales, specifically the area in and around western Sydney. It mostly occurs within the Cumberland subregion of the Sydney Basin bioregion (as defined by the Interim Biogeographic Regionalisation for Australia—IBRA v6.1), with some occurrences extending into neighbouring subregions. The ecological community is known to occur in these local government areas: Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly. However, it is possible that some remnants may occur in neighbouring areas not listed above.



Dillwynia sieberi



Areas where the ecological community is likely to be found

7



Podargus strigoides (tawny frogmouths)

How do I know if I am standing in a patch of the ecological community?

This section is designed to help you determine if a native vegetation remnant could be part of the listed Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. The description, key diagnostic characteristics and condition thresholds of the ecological community in the EPBC Act listing advice are summarised and further explained in the following pages.

If you are on the Cumberland Plain and a native vegetation patch meets the description of the listed ecological community, then you are likely to be standing in the listed ecological community. Help in identifying species may be obtained from your local community environment groups, catchment management authorities, other state agencies, local council, or an ecological consultant.



Indigofera australis (native indigo)

Key diagnostic features and condition thresholds decision flowchart

Condition thresholds were established for the national ecological community to determine which patches are of highest conservation value and should receive full protection as a matter of national environmental significance under the EPBC Act. The condition thresholds are intended to focus national legal protection on native vegetation patches that are functional, relatively natural and in relatively good condition. Some patches of the ecological community are in such a heavily degraded state that they would not meet the condition thresholds.

The decision flowchart on page 11 and snapshot on pages 12–13 are intended to help determine whether a patch of native vegetation is part of the listed ecological community. In addition to this information, you should note that:

- the description, key diagnostic characteristics and condition thresholds of the ecological community in the listing advice provides the definitive source of information for identifying the nationally threatened ecological community and should be referred to if further detail is required, and
- on-site assessment is required to determine whether the national ecological community is present at a particular site.

While only patches of the ecological community that meet the condition thresholds are considered a matter of

national environmental significance, other patches of the ecological community and surrounding vegetation may be protected by the EPBC Act if activities that affect them will have a significant impact on the ecological community. Removal or degradation of nearby native vegetation patches may have a significant impact on the future viability of listed patches of the ecological community. Patches may also be protected under other legislation that require assessment before any works begin (contact your local council, catchment management authority or other relevant state authority if you are unsure whether this applies to you).

Note that appropriate management of patches that do not meet the condition thresholds should continue, where possible, as they may still play an important ecological role, especially where they are providing valuable habitat or connectivity functions. For example, patches that link native vegetation remnants in the landscape are particularly important as wildlife habitat and to the future viability of listed patches of the ecological community. Both patches that meet the condition thresholds and those that do not should be considered in recovery and other management actions, for instance through the Australian Government's Caring for our Country initiative. Patches that do not meet the condition thresholds may be eligible for funding to restore them to a better condition.

About 70 per cent of the remaining ecological community occurs in patches that are less than five hectares. The retention of small patches that meet the condition thresholds

is vital to the future of this ecological community, particularly where they link other patches in the broader landscape. Additional reconnection of these patches will be important to improve the extent and function of the ecological community in the future.



Eucalyptus fibrosa (red ironbark, broad-leaved ironbark)



Eucalyptus moluccana (grey box, coastal greybox)



Notes for the flowchart:

The flowchart summarises the key diagnostic characteristics and condition thresholds and is intended to help identify whether the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community is likely to be present at a particular site. Other considerations to help with assessment of significant impact (see page 16), such as landscape connectivity, need to be taken into account when doing an on-site inspection.

- The typical dominant tree species are grey box, forest red gum and red ironbark. Dominant means that one or more of these species comprises 50 per cent or more of the tree cover. Other tree canopy species may occur in association with the typical dominant species and may be locally dominant within the patch at some sites (see Key species on page 17).
- Projected foliage cover excludes gaps between branches and leaves—for example, the amount of shadow that would be cast on the ground if there were a light source directly overhead.
- 3. A patch is defined as a discrete and continuous area that comprises the ecological community. It is recognised that patches may occur in a range of sizes and shapes. In general, surveys within patches should be based on samples of at least 0.04 ha (a 20 m x 20 m plot or equivalent). The number of plots (quadrats or survey transects) per patch must take into consideration the size, shape and condition across the site. Permanent

man-made structures, such as roads and buildings, are typically excluded from a patch, but a patch may include small-scale disturbances, such as tracks or breaks or other small-scale variations in native vegetation that do not significantly alter the overall functionality of the ecological community—for instance, the easy movement of wildlife or dispersal of plant spores and seeds.

- This determines how much of the understorey is native versus exotic. Perennial understorey vegetation cover includes vascular plant species of the ground and shrub layers with a lifecycle of more than two growing seasons. Measurements of perennial understorey vegetation cover exclude annuals, lichens and mosses, leaf litter or exposed soil.
- 5. Contiguous means the woodland patch is continuous with, or close to (within 100 m), another patch of vegetation that is dominated by native species in each vegetation layer present. Apart from native vegetation with a tree canopy, adjoining native vegetation may consist of derived grasslands or shrublands. 'Derived' or 'secondary' grasslands or shrublands are sites where the trees have been cleared but the native understorey is retained, giving the appearance of a grassland or shrubland.
- 6. dbh—diameter at breast height (measured 1.3 m above the base of the tree).

Flowchart of key diagnostic features and condition thresholds to identify the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community



Notes: See page 10 for notes.

11

Snapshot: Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

A critically endangered national ecological community.

What's it look like?



Mostly woodland with eucalypt trees over shrubs or grasses and wildflowers. Some areas have more of a forest structure.







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Tree canopy is usually dominated by grey box, coastal grey box (*Eucalyptus moluccana*) (left), forest red gum (*Eucalyptus tereticornis*) (centre), or red ironbark, broad-leaved ironbark (*Eucalyptus fibrosa*) (right). Some patches may also have a lower tree layer, where trees such as acacias and paperbarks (*Melaleuca decora*) may be common.



The ground layer is dominated by a variety of tussock grasses and grass-like plants. A variety of herbs and wildflowers may be interspersed among the tussocks.





Many patches also contain a shrub layer. Blackthorn (*Bursaria spinosa*) is common in the shrub layer and may be dense when fire frequencies are low.

Where do I find it?

- Occurs on the Cumberland Plain of the Sydney region, New South Wales.
- On flat to undulating or hilly terrain, usually at low elevations up to 350 m altitude.
- Many patches are small. Most patches occur on private land, some are in reserves.
- Some examples can be seen at Mt Annan Botanic Garden, Mulgoa Nature Reserve, Prospect Nature Reserve and Scheyville National Park.

What else is it known as?

Corresponds with two threatened ecological communities listed under the New South Wales *Threatened Species Conservation Act 1995*:

- Cumberland Plain Woodland of the Sydney Basin Bioregion.
- Shale-Gravel Transition Forest of the Sydney Basin Bioregion.

Why it's important to protect it....

- This ecological community was formerly widespread but is now reduced to mostly small fragments of less than 5 ha.
- Less than 10 per cent now remains.
- It continues to be threatened by clearing, impacts from nearby urban areas, weeds and inappropriate management.
- Future protection, including of the smallest patches, will provide vital support for native biodiversity and ecosystem services in the region, such as managing water tables and flows, soil nutrient cycling, reducing erosion and salinity, storing carbon, regulating local temperature and regulating insect pests.
- Connectivity among remaining native vegetation areas is essential for the animals that live or migrate through the region. Patches that are connected, or are close to each other, also help to ensure the future viability of the ecological community and other native vegetation, by providing pollination and dispersal of plant propagules.
- It provides habitat for some threatened species, such as the spiked riceflower (*Pimelea spicata*).
- It's essential to apply the right land use and management practices to maintain and restore this community.



Is the listed ecological community known by other names?

Vegetation may be identified in different ways among regions, states and territories, depending on the vegetation classification system and environmental legislation that are applied. The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community relates to, or may be known as, other vegetation types, the most important and recent of which are shown in the table below.



Acacia parramattensis (Parramatta wattle)

Vegetation classification	Vegetation classifications that relate to the national ecological community
Threatened ecological communities listed in NSW under the <i>Threatened Species</i> <i>Conservation Act 1995</i> (TSC Act) (and status under the TSC Act).	Cumberland Plain Woodland in the Sydney Basin Bioregion (critically endangered)
	Shale-Gravel Transition Forest in the Sydney Basin Bioregion (endangered)
 Equivalent Vegetation Mapping Classifications: 1. Cumberland Plain vegetation mapping units (NPWS Interpretation Guidelines for Cumberland Plain native vegetation maps 2002; Tozer 2003). 	1. 9 Shale Hills Woodland.
	2. GW p28 Cumberland Shale Hills Woodland.
	3. S_GW02 Cumberland Shale Hills Woodland.
	4. Grey Box-Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin.
 Regional Class (Tozer et al. 2006; South Coast - Illawarra Vegetation Integration (SCIVI) project). 	h 1. 10 Shale Plains Woodland.
	2. GW p29 Cumberland Shale Plains Woodland.
 Vegetation Community from the Native Vegetation of the Sydney Metropolitan Catchment Management Authority (CMA) Region Project (DECCW 2009). 	3. S_GW03 Cumberland Shale Plains Woodland.
	4. Grey Box-Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin.
 NSW BioBanking and Property Vegetation Plan (PVP) BioMetric vegetation type. 	1. 103 Shale Gravel Transition Forest.
	2. DSF p502 Castlereagh Shale-Gravel Transition Forest.
	3. S_DSF02 Castlereagh Shale-Gravel Transition Forest.
	4. Broad-leaved Ironbark–Grey Box–Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin
National Vegetation Information System (NVIS)—Major Vegetation Subgroup	Eucalyptus woodlands with a grassy understorey

14 | Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

The major differences between the nationally-listed and state-listed threatened ecological communities are:

- the nationally-listed ecological community groups two separately listed state ecological communities on the basis of similarities in their vegetation
- the nationally-listed ecological community specifies condition thresholds while the state-listed communities do not, and
- the nationally-listed ecological community does not include the derived grassland or shrubland state of the woodland. However, grassland or shrubland derived from the woodland may occur as smallscale variations within a patch, and are also considered to be native vegetation when determining whether a patch of the ecological community adjoins a large (more than 5 ha) native vegetation remnant (as per the condition thresholds in the flowchart). The state-listed woodland community specifically includes derived grasslands, irrespective of their landscape context.

Patches will require on-ground assessment to confirm whether they meet the description and the condition thresholds of the national ecological community at an appropriate scale, given the landscape context and scale of any proposed development. If patches meet the description and condition thresholds they should be considered for assessment as a matter of national environmental significance.



Melaleuca decora (paperbark)

Note that other nationally-listed threatened ecological communities also occur in or near the Cumberland Plain or Sydney regions, including Blue Gum High Forest of the Sydney Basin Bioregion, Eastern Suburbs Banksia Scrub of the Sydney Region, Shale-Sandstone/Transition Forest and Turpentine-Ironbark Forest of the Sydney Basin Bioregion.

For further information on these nationally-listed threatened ecological communities go to: www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl

These, along with other matters of national environmental significance, such as individually listed threatened species, heritage sites and internationally important Ramsar wetlands are also subject to protection under the EPBC Act. For further information on these matters see *Where can I go for further information?* on page 28.





Other considerations to help with assessment

The landscape context surrounding a patch of the ecological community is important for its future conservation. Considerations that may help determine whether a patch has additional conservation value include:

- connectivity to other native vegetation remnants or restoration works (for example, native plantings). In particular, a patch in an important position between (or linking) other patches (or other native vegetation remnants) in the landscape. This may include derived shrublands or grasslands that are adjacent to patches of the ecological community
- patches that occur in those areas in which the ecological community has been most heavily cleared and degraded or that are at the natural edge of its range
- large patch size and/or a large area to boundary ratio. Such patches are less exposed and more resilient to edge effect disturbances such as weed invasion
- evidence that native species are recruiting or that a range of age cohorts are present.
 For instance, tree canopy species are present as saplings through to large hollow-bearing trees
- good faunal habitat as indicated by the presence of trees with hollows, logs, natural rock outcrops, diversity of

landscape, contribution to movement corridors

- high biodiversity (large number of native fauna species and/or a variety of groundlayer native plant species, such as different grasses, lilies, orchids and other wildflowers)
- areas of minimal weeds and feral animals or where they can be easily managed
- presence of cryptogams (lichens and mosses) and leaf litter on the soil surface, indicating low disturbance and potential for good functional attributes such as nutrient cycling
- patches that contain individually listed threatened species (state or national), and/or
- the strategic context in which the patch occurs within the broader landscape.



Rubus parvifolius (native raspberry)

KEY SPECIES

The following photos show some of the key flora species characteristic of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community. Note that not all species shown may always be present, and other plant species not shown here may be present, at any given site.

An expanded list of key species characteristic of the ecological community can be found in the listing advice for the national ecological community, available from: www. environment.gov.au/biodiversity/threatened/ communities/pubs/112-listing-advice.pdf

Upper and mid vegetation layers

Tree canopy—typical dominants



Eucalyptus moluccana (grey box, coastal grey box)



Eucalyptus tereticornis (forest red gum)



Eucalyptus fibrosa (red ironbark, broad-leaved ironbark)

Tree canopy—present or locally dominant



Eucalyptus crebra (narrow-leaved ironbark)



Eucalyptus eugenioides (thin-leaved stringybark)



Corymbia maculata (spotted gum)



Lower tree canopy

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Acacia decurrens (black wattle, green wattle)



Acacia parramattensis (Parramatta wattle)



Acacia implexa (hickory wattle)



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Exocarpos cupressiformis (native cherry)



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Melaleuca decora (paperbark)

Understorey shrubs



Acacia falcata (sally)



Breynia oblongifolia (coffee bush)



Bursaria spinosa (blackthorn)



Daviesia ulicifolia (gorse bitter pea)



Dillwynia sieberi



Dodonaea viscosa subsp. cuneata (wedge-leaf hop-bush)



Indigofera australis (native indigo)



Lissanthe strigosa (peach heath)



Rubus parvifolius (native raspberry)



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Grasses and grass-like plants



Aristida ramosa (purple wiregrass)



Cymbopogon refractus (barbed wire grass)



Dichelachne micrantha (plumegrass)



Microlaena stipoides subsp. *stipoides* (weeping grass)



Themeda triandra (kangaroo grass)



Cyperus gracilis (slender sedge)



Lomandra filiformis subsp. *filiformis* (wattle mat-rush)



Lomandra multiflora subsp. *multiflora* (many-flowered mat-rush)

These are other grass and grass-like plants that may be present but are not pictured:

Aristida vagans (threeawn speargrass) Echinopogon caespitosus var. caespitosus (tufted hedgehog grass) Eragrostis leptostachya (paddock lovegrass) Paspalidium distans Carex inversa (knob sedge)



Common wildflower and fern species



Asperula conferta (common woodruff)

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Desmodium varians (slender tick-trefoil)



Glycine spp. (glycine)



Oxalis perennans (wood sorrel)



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Brunoniella australis (blue trumpet)



Dianella longifolia (blue flax-lilly)



Goodenia hederacea subsp. hederacea (ivy goodenia)



Pratia purpurascens (whiteroot)



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Cheilanthes sieberi (poison rock-fern)



Dichondra repens (kidney weed)



Hardenbergia violacea (native sarsparilla)



Wahlenbergia gracilis (Australian bluebell)

Species of special importance

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest provides habitat for several threatened native plants and animals. At the national level, at least 14 plant and animal species that may be found in or near the ecological community are listed as threatened under the EPBC Act. At least a further 29 species are listed as threatened under New South Wales environmental laws.

Birds



Lathamus discolor (swift parrot) Endangered (EPBC Act, NSW)



Anthochaera phrygia (regent honeyeater) Endangered, migratory (EPBC Act, NSW)



Burhinus grallarius (bush stone curlew) Endangered (NSW)

Mammals



Dasyurus maculatus maculatus (spotted-tail quoll) (south-eastern mainland population) Endangered (EPBC Act) Vulnerable (NSW)



Pteropus poliocephalus (grey-headed flying fox) Vulnerable (EPBC Act, NSW)



More information on nationally listed species may be found on the species profile and threats database (SPRAT) at: www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

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The New South Wales Government also provides information on recovery actions for species listed in New South Wales, which covers many of those identified here. They are found on the NSW threatened species website at: www.threatenedspecies.environment.nsw.gov.au/tsprofile/index.aspx

Plants



Acacia pubescens (downy wattle, hairy stemmed wattle) Vulnerable (EPBC Act, NSW)



Eucalyptus benthamii (Camden white gum, Nepean River gum) Vulnerable (EPBC Act, NSW)



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Micromyrtus minutiflora Vulnerable (EPBC Act) Endangered (NSW)



Persoonia nutans (narrow-leaved geebung) Endangered (EPBC Act, NSW)



Pterostylis saxicola (Sydney plains greenhood) Endangered (EPBC Act, NSW)



Pimelea curviflora var. curviflora (riceflower) Vulnerable (EPBC Act, NSW)



Pultenaea parviflora Vulnerable (EPBC Act) Endangered (NSW)



Pimelea spicata (spiked riceflower) Endangered (EPBC Act, NSW)

Some other species of special importance that may occur in the ecological community:

Mammals: Chalinolobus dwyeri (large-eared pied bat) Vulnerable (EPBC Act, NSW)

Plants: Cynanchum elegans (white-flowered wax plant) Endangered (EPBC Act, NSW)

WHAT DOES THE LISTING MEAN FOR APPROVAL AUTHORITIES OR LAND MANAGERS?

If the listed ecological community is present at or near a particular site, adequate protection and appropriate land use practices are vitally important for the ecological community to persist for the benefit of future generations.

The listing of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act will not prevent land managers from continuing to use land in the same way they were before the EPBC Act came into effect. This is providing that they do not significantly change or intensify their activities, and that the activity was lawful.

National protection means any new or intensified activities that may have a significant impact on one or more patches of the listed ecological community should be referred to the federal environment minister for assessment and approval. Activities likely to require approval under the EPBC Act (if significant) include, but are not restricted to, clearing native vegetation, development close to a particular site, significantly changing drainage and local water patterns and broad-scale applications of herbicides or fertilisers to a site. On the other hand, activities that are unlikely to require approval include: routine maintenance of buildings and properties, maintenance of firebreaks, routine burn-offs or weed management (with minimal or positive impacts on the ecological community).

Land managers should also note that some native species that occur on the Cumberland Plain may be otherwise protected under the EPBC Act. Land managers also should ensure that any other nationally protected matters, such as threatened species, Ramsar wetlands or heritage-listed sites, are not significantly affected.

The EPBC Act allows for some exemptions to the requirement for assessment and approval. This means some activities may not need to be referred for assessment or approval under certain circumstances. However, failure to refer an action that is likely to have a significant impact on the listed ecological community may have legal consequences such as financial penalties or remediation orders.





Pratia purpurascens (whiteroot)

If you are considering an activity that may have an impact on the ecological community, you are encouraged to contact the department about your options. Further information is available from the department's website on:

Exemptions:

www.environment.gov.au/epbc/publications/ exemptions.html

Referrals: www.environment.gov.au/epbc/assessments/ referral-form.html

Approvals: www.environment.gov.au/epbc/approval.html You should also check whether state or local government approvals are required in addition to EPBC Act requirements before starting an activity. The national ecological community corresponds to two communities listed and protected under the NSW *Threatened Species Conservation Act 1995*, and also provides habitat for threatened species individually listed under state legislation (some of which are not protected under national environment law). Relevant state contacts are given under *Where can I go for further information?* on page 28.



Kangaroos in grassy woodland

MANAGING THREATS AND PRIORITY CONSERVATION ACTIONS

Over 200 years of intensive land use in the Sydney Basin Bioregion has severely affected the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. Most of the woodland and forest has been cleared, originally for agriculture and later for urban development. The main threats to the ecological community continue to be: vegetation clearing; the consequent fragmentation of native vegetation remnants; the low proportion of remnants protected in reserves; weed invasion; increased nutrient loads due to fertiliser run-off from nearby developed lands; rubbish dumping; inappropriate management regimes; and climate change.

Major weed species



Lycium ferocissimum (African boxthorn)



Asparagoides asparagoides (bridal creeper)



Eragrostis curvula (African lovegrass)



Araujia sericifera (moth vine)



Olea europaea subsp. *cuspidata* (African olive)



Chloris gayana (rhodes grass)





Cyperus gracilis flower (slender sedge)

You can help by looking after bush remnants in your area and by:

- limiting undue access to the national ecological community by you, your pets, garden plants, rubbish and your vehicles
- practising environmentally safe bushwalking by keeping to paths, not trampling or removing plants, and keeping pets on a lead (and taking a bag for droppings)
- disposing of waste (for example, cigarette butts, garden clippings) wisely and reporting any unauthorised fires or dumped rubbish to the appropriate authorities
- avoiding firewood collection (dead and fallen trees) and allowing fallen timber to remain on the ground to provide fauna habitat
- supporting local efforts to conserve native vegetation and wildlife in your area by joining a local organisation such as a Landcare or catchment group, natural history or a 'friends of' group or by volunteering for Conservation Volunteers Australia, and
- participating in special events, information nights, tree planting days and weed eradication programs in your local area.

The conservation advice on the department's website highlights priority actions for the future conservation of the ecological community. It can be downloaded from: www.environment.gov.au/cgi-bin/sprat/public/ publiclookupcommunities.pl Further detailed information on recovering and managing native vegetation remnants in the western Sydney region is available in Recovering Bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland, which can be downloaded from: www.environment.nsw.gov.au/threatenedspecies/ CumberlandPlainManagementGuidelines.htm

Protecting and restoring the Cumberland Plain Woodland community at Campbell Hill West Reserve, Chester Hill:

www.environment.nsw.gov.au/resources/threaten edspecies/08639cumbplnwl.pdf

Recovery plans for threatened species and ecological communities on the Cumberland Plain help to address the key threats and how to manage the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest for its preservation into the future. When completed, a national recovery plan will be available from: www.environment.gov.au/biodiversity/threatened/ recovery-list-common.html



African olive can degrade the understorey by competing with and preventing regeneration of native species. Removal of African olive can help restore the ecological community.

Is funding available to protect the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest?

The Australian Government has provided significant funding to help restore and conserve some patches of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. Local community groups and councils have used the funding to improve these valuable remnants by replanting native species, removing weeds, and maintaining wildlife and vegetation corridors.

Funding is available for projects to protect and recover nationally threatened species and ecological communities through Caring for our Country. Information about Caring for our Country grants is available at: www.nrm.gov.au/funding/index.html

Funding to protect patches of the ecological community may also be available from the New South Wales Government and agencies through BioBanking and vegetation conservation incentive schemes. For further information on BioBanking see www.environment.nsw.gov.au/biobanking/

Information about vegetation conservation incentive schemes can be obtained from your local catchment management authority or council. Landholders who wish to provide permanent protection for native vegetation or special features on their land may also enter into conservation agreements with the NSW Government. Further information on conservation agreements is available at: www.environment.nsw.gov.au/cpp/ ConservationAgreements.htm



The ecological community is threatened by new urban developments. Maintaining patches and improving connectivity around developments improves the local environment and conserves biodiversity.





Goodenia hederacea subsp. hederacea (ivy goodenia)

WHERE CAN I GO FOR FURTHER INFORMATION?

Listing advice and conservation advice for the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest

These are the definitive sources of information about the nationally-listed ecological community and can be downloaded from:

www.environment.gov.au/cgi-bin/sprat/public/ publiclookupcommunities.pl

(click on the details link against the name of the ecological community then follow the link to listing and conservation advice).



Gumleaf grasshopper

Information about other matters of national environmental significance that may need to be considered

- Other EPBC-listed threatened ecological communities: www.environment.gov.au/cgi-bin/sprat/public/ publiclookupcommunities.pl
- Individually listed threatened species under the EPBC Act: www.environment.gov.au/cgi-bin/sprat/public/ sprat.pl
- Internationally significant Ramsar wetlands: www.environment.gov.au/water/topics/wetlands/ index.html
- Australia's heritage places: www.environment.gov.au/heritage/index.html





Pteropus poliocephalus (grey-headed flying fox)

Threatened communities and vegetation management laws in New South Wales

Information about state-listed communities and vegetation management laws are available from these New South Wales agencies:

- NSW Department of Environment, Climate Change and Water: www.environment.nsw.gov.au/ threatenedspecies/
- Sydney Metropolitan Catchment Management Authority: www.sydney.cma.nsw.gov.au/
- Hawkesbury–Nepean Catchment Management Authority: www.hn.cma.nsw.gov.au/



Cymbopogon refractus (barbed wire grass)

Information about vegetation in western Sydney (some of these mapping projects were referenced in the table on page 14)

• The Mt Annan Botanic Garden—Ecology of Cumberland Plain Woodland.

This website provides useful information about the ecology of the woodland and has detailed photos of the key plant and animal species that comprise the ecological community:

www.rbgsyd.nsw.gov.au/science/ Evolutionary_Ecology_Research/Ecology_ of_Cumberland_Plain_Woodland

- Benson D and Howell J (1990). Taken for granted: the bushland of Sydney and its suburbs. Kangaroo Press and Royal Botanic Gardens Sydney.
- Howell J, Benson D and Plaza J (2000). Sydney's bushland: more than meets the eye. Royal Botanic Gardens Sydney, NSW.
- The interpretation guidelines for Cumberland Plain native vegetation maps (2002): www.environment.nsw.gov.au/surveys/ GetHoldOfMapsDataAndReports.htm www.environment.nsw.gov.au/resources/
 - nature/cumbPlainMappingInterpguidelines. pdf Tozer M (2003). The native vegetation of the Cumberland Plain, western
 - Sydney: systematic classification and field identification of communities, Cunninghamia 8(1): 1–75.



This is a scientific paper that describes the vegetation communities of the Cumberland Plain. It is available through the website of the Royal Botanic Gardens, Sydney: www.rbgsyd.nsw.gov.au/science/Scientific_ publications/cunninghamia/

 Tozer MG, Turner K, Simpson CC, Keith DA, Beukers P, MacKenzie B, Tindall D and Pennay C (2006). Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands. Version 1.0. NSW Department of Environment and Conservation, NSW Department of Natural Resources, Sydney.

This report describes the native vegetation of south-east NSW, including the Cumberland Plain, and was produced from the South Coast - Illawarra Vegetation Integration (SCIVI) project.

 DECCW (2009). The Draft Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area (Vol 1 & 2). Unpublished report and digital mapping funded by the Australian Government and the Sydney Metro Catchment Management Authority. Department of Environment, Climate Change & Water, Hurstville

This report provides up-to-date information on native vegetation within the Sydney Metropolitan Catchment Management Authority area, and also relates to previous studies described above (Tozer 2003; Tozer et al. 2006).

Additional copies

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Enquiries and requests for further copies of this booklet can be directed to the Department of the Environment, Water, Heritage and the Arts community information unit on:

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Freecall: 1800 803 772

Email: ciu@environment.gov.au

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