

**Approved Conservation Advice for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community**

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing plans, records or management prescriptions for this ecological community.

**Description**

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest represents certain occurrences of the coastal plain grassy eucalypt woodlands that are endemic to the shale hills and plains of the Sydney Basin Bioregion in NSW and which occur primarily in, but not limited to, the Cumberland Sub-region. The ecological community incorporates the grassy eucalypt shale hills and plains woodlands and the shale-gravel transition forests of this region.

The ecological community ranges from grassy woodland to forest, with the understorey (i.e. the ground plus shrub layers) varying from predominately grassy to predominately shrubby. Some stands are much denser than the typical woodland form, particularly in the shale-gravel transition forest variant. The ecological community may have an upper tree layer, lower tree layer, shrub layer and a ground layer though in any given patch one or more layers may be absent or depauperate. For the purposes of listing under the EPBC Act, the ecological community always has upper tree layer species present and either a shrub or ground layer present.

The tree canopy is typically dominated by *Eucalyptus moluccana* (Coastal Grey Box), *E. tereticornis* (Forest Red Gum) and/or *E. fibrosa* (Red Ironbark). Other canopy species may occur in association with typical dominants and may be locally dominant at some sites. A sparse smaller tree stratum, typically with young eucalypts and *Acacia* species, may also be present. The understorey typically is dominated by the ground layer and comprises a variety of perennial native grasses, grasslike plants and other non-woody plants. A shrub layer may also be present, to variable extent, and is usually dominated by *Bursaria spinosa* (Blackthorn).

**Conservation Status**

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest is listed as critically endangered. This ecological community is eligible for listing as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as, in 2009, the Minister considered the Threatened Species Scientific Committee's (TSSC) advice (TSSC, 2009) and amended the list under section 184 to include the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. The TSSC determined that this ecological community met criteria 1, 2, 4 & 5 of their eligibility criteria. The ecological community is also listed in New South Wales under the *Threatened Species Conservation Act 1995* as 'Cumberland Plain Woodland in the Sydney Basin Bioregion' and the 'Shale Gravel Transition Forest in the Sydney Basin Bioregion.'

**Distribution and Habitat**

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community is limited to the Sydney Basin Bioregion with most occurrences in the Cumberland Sub-region. This covers a geographic area commonly known as the Cumberland Plain, a rain shadow coastal valley to the immediate west of Sydney. This ecological

community occurs within the Sydney Metro and Hawkesbury-Nepean Natural Resource Management Regions.

The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest typically occurs on flat to undulating or hilly terrain, at elevations up to approximately 350 metres above sea level. Some occurrences may extend onto locally steep sites at slightly higher elevations. Most occurrences are on clay soils derived from Wianamatta Group geology, with limited to rare occurrences on other soil types.

In 2009, the ecological community occupied a maximum area of approximately 12 300 hectares (ha) but is highly fragmented into generally small remnants, mostly under 10 ha in size (Tozer, 2003).

### **Threats**

The main and ongoing threats to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community include: clearing for urban, industrial or rural development, the consequent fragmentation of native vegetation remnants, inappropriate grazing and fire regimes, weed invasion and the low level of protection in reserves. Vegetation clearance was, and continues to be, the major contributor to the loss and fragmentation of native vegetation across the Cumberland Plain. The continuing decline is predominately a consequence of dispersed, small scale clearing actions associated with urban development (NSW Scientific Committee and Simpson, 2008). The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community supports a range of weeds with particularly high impacts due to invasion by African Olive (*Olea europaea* subsp. *cuspidata*), Bridal Creeper (*Asparagus asparagoides*), and a range of exotic grasses (NSW Scientific Committee, 2008).

The main potential threat to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community is climate change. The potential large scale impacts of climate change could influence the species composition of this ecological community through their responses to disturbance and the very nature of those disturbances. It could also possibly influence the future distribution and extent of the ecological community.

### **Strategic Priority**

The uplisting of this ecological community to critically endangered is occurring at the same time that the expansion of western Sydney is resulting in significant urban housing and other infrastructure development across the Cumberland Plain. In this context, an immediate conservation priority is to develop a strategic program to ensure that the national ecological community and other biodiversity values are given adequate consideration in decision-making. The strategic program should guide the best possible biodiversity protection and conservation outcomes for the region, especially the national ecological community and other EPBC-listed matters.

The program needs to take an appropriate broadscale landscape approach. Native vegetation on the Cumberland Plain urgently requires a plan for protection, restoration and reconnection. To facilitate this, additional mapping and analysis of native vegetation remnants, particularly EPBC-listed ecological communities, are required to identify their current state and values to inform priorities for recovery actions. This prioritisation should recognise that, in addition to large remnants that are in important ecological locations on the Cumberland Plain, many smaller remnants provide valuable habitat and ecological connectivity. The program should therefore identify those remnants that are most important for long-term conservation and recovery of the community. Consideration should be given to position inside and out of planned urban growth areas, proximity of smaller remnants to larger native vegetation

remnants, conserving habitat values (e.g. large trees with hollows) and functionality as corridors or 'stepping stones' for fauna and flora.

Such corridors and reconnection work must consider the unique and important role the ecological community plays in the broader landscape. For instance, the role of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest for migrating birds and bats that may move through the Cumberland Plain on a seasonal basis in both a north-south direction (e.g. from other coastal woodlands of eastern Australia) and in an east-west direction (either side of the Great Dividing Range and from other ecological communities surrounding the Cumberland Plain). Whilst the connectivity of remnants that meet the *Description* and *Condition Thresholds* in the listing advice for the national ecological community is a high priority, reconnection to lower-quality remnants, other ecological communities or native plantings should also be considered in order to optimise biodiversity outcomes across the landscape. This is particularly the case for derived grasslands and other areas that can be restored to meet the *Description* and *Condition Thresholds* for the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.

While further loss to this critically endangered ecological community (and other EPBC-listed matters) should be avoided, the strategic program needs to provide guidance on appropriate offset strategies and other mitigation measures at the landscape level where losses do occur. In order to minimise the impact on ecological processes caused by the further loss of remnants, these mitigation measures must aim to maintain the geographic range of the ecological community, and other EPBC-listed matters, and improve the extent and/or integrity of the national ecological community. The capacity for longer-term protection and appropriate conservation management must also be an important consideration for any mitigation actions.

### **Research Priorities**

- Undertake survey work in suitable and potential sites to locate additional remnants or confirm their presence and condition; and to identify threatened flora and fauna that may require specific conservation measures.
- Continue to build upon existing research efforts into the impacts of various management regimes, the restoration of ground layer species and the regeneration of trees and shrubs in the ecological community.
- Map and survey remnants that meet the condition thresholds for the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.

### **Regional Priority Actions**

The following regional priority recovery and threat abatement actions can be done to support the recovery of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.

#### **Habitat Loss, Disturbance and Modification**

- Monitor known sites to identify key threats.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Identify sites of high conservation priority.
- Implement appropriate management regimes to maintain the biodiversity, including threatened species, of the ecological community.
- Develop and implement best practice standards for management of remnants on private and public lands.

- Liaise with planning authorities to ensure that planning for growth zones in urban and peri-urban areas takes the protection remnants into account, with due regard to principles for long-term conservation.
- Liaise with local councils and State authorities to ensure new development, road widening, maintenance activities or other activities involving substrate or vegetation disturbance in areas where the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community occurs do not adversely impact on known remnants.
- Investigate formal conservation arrangements, management agreements and covenants on private land, and for crown and private land investigate inclusion in reserve tenure if possible. This is particularly important for areas that link remnants and create wildlife corridors.
- Manage any changes to hydrology that may result in changes to water table levels. In addition, develop and implement urban stormwater management guidelines that address risks of urban run-off to the ecological community.

#### Invasive Weeds

- Ensure chemicals or other mechanisms used to manage weeds do not have a significant adverse impact on Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.
- Manage sites to prevent introduction or further spread of invasive weeds, which become a threat to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community, using appropriate methods.
- Develop and implement a management plan for the control of African Olive (*Olea europaea* subsp. *cuspidata*) in the region.

#### Trampling, Browsing or Grazing

- Ensure that livestock grazing uses an appropriate management regime and density that does not detrimentally affect remnants of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.
- Manage known sites on private property to ensure appropriate stock grazing regimes are conducted to maintain and enhance native biodiversity.

#### Fire

- Identify circumstances under which an ecological burn may be required for the conservation of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community, and develop and implement suitable ecological fire management strategies.
- Where appropriate provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plan(s), risk register and/or operation maps.
- Negotiate appropriate standing procedures with local fire brigades.

#### Conservation Information

- Raise awareness of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community within the local community e.g. through active Conservation Management Networks, Landcare groups and other groups.
- Maintain liaisons with private landholders and land managers of land on which remnants of the ecological community occur.

#### Enable Recovery of Additional Sites and/or Populations

- Investigate options to maintain and improve connectivity of remnants, including the protection of paddock trees and replanting of key canopy tree species in derived grasslands and shrublands, where possible.

This list does not necessarily encompass all actions that may be of benefit to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community, but highlights those that are considered to be of highest priority at the time of preparing the Conservation Advice.

**Existing Plans/Management Prescriptions that are Relevant to the Ecological Community**

- Benson D and Howell J (1990) Taken for granted: the bushland of Sydney and its suburbs. Kangaroo Press and Royal Botanic Gardens Sydney.
- Botanic Gardens Trust (2009) Ecology of Cumberland Plain Woodland. Available on the Internet at: [http://www.rbgsyd.nsw.gov.au/science/current\\_research/Ecology\\_of\\_Cumberland\\_Plain\\_Woodland](http://www.rbgsyd.nsw.gov.au/science/current_research/Ecology_of_Cumberland_Plain_Woodland)
- Buchanan R (1989) Bush regeneration: recovering Australian landscapes. TAFE NSW.
- New South Wales Department of Environment and Climate Change (2008). Draft Bushland of the Cumberland Plain: Directions for Recovery Working Paper, November 2008.
- New South Wales Department of Environment and Conservation (2005). Recovering bushland on the Cumberland Plain: best practice guidelines for the management and restoration of bushland. Available on the Internet at: <http://www.environment.nsw.gov.au/threatenedspecies/CumberlandPlainManagementGuidelines.htm>
- Dorrough J, Stol J and McIntyre S (2008). Biodiversity in the Paddock: a Land Managers Guide. Future Farm Industries CRC, Canberra. Available on the Internet at: [http://www.futurefarmcrc.com.au/documents/Biodiversity\\_in\\_the\\_Paddock.pdf](http://www.futurefarmcrc.com.au/documents/Biodiversity_in_the_Paddock.pdf)
- Howell J, Benson D and Plaza J (2000). Sydney's bushland : more than meets the eye. Royal Botanic Gardens Sydney, NSW.
- Langford C, Simpson P, Garden D, Eddy D, Keys M, Rehwinkel R and Johnston W (2004). Managing Native Pastures for Agriculture and Conservation. NSW Department of Primary Industries.
- McIntyre S, McIvor JG and Heard KM (eds) (2002). Managing and Conserving Grassy Woodlands. CSIRO Publishing, Melbourne.

These prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

**Information Sources:**

New South Wales Scientific Committee and Simpson (2008) Change in the distribution of Cumberland Plain Woodland.

Tozer, M (2003) The native vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities, *Cunninghamia* 8(1): 1-75.

TSSC (Threatened Species Scientific Committee) (2009). Listing advice for the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community.

Available on the internet at:

<http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>