

NSW SCIENTIFIC COMMITTEE

Preliminary Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Preliminary Determination to support a proposal to list the New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion, as a CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY in Part 2 of Schedule 1A of the Act and as a consequence, to omit reference to New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion, from Part 3 of Schedule 1 (Endangered Ecological Communities) of the Act. Listing of Critically Endangered Ecological Communities is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is the name given to the ecological community characterised by the species assemblage listed in paragraph 2. These Bioregions are as defined by IBRA 7 (SEWPaC 2012). A map of this version of the Interim Biogeographic Regionalisation of Australia is available at:
<http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/maps.html>
2. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is characterised by the following assemblage of species:

<i>Acaena novae-zelandiae</i>	<i>Acaena ovina</i>
<i>Ammobium alatum</i>	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>
<i>Asperula conferta</i>	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>
<i>Bothriochloa macra</i>	<i>Bulbine bulbosa</i>
<i>Carex inversa</i>	<i>Cassinia quinquefaria</i>
<i>Chrysocephalum apiculatum</i>	<i>Craspedia variabilis</i>
<i>Crassula sieberiana</i>	<i>Cymbonotus lawsonianus</i>
<i>Cymbopogon refractus</i>	<i>Desmodium varians</i>
<i>Dichelachne micrantha</i>	<i>Dichondra repens</i>
<i>Dichopogon fimbriatus</i>	<i>Dillwynia sieberi</i>
<i>Discaria pubescens</i>	<i>Drosera peltata</i>
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	<i>Echinopogon mckiei</i>
<i>Echinopogon ovatus</i>	<i>Einadia nutans</i>
<i>Elymus scaber</i>	<i>Epilobium billardierianum</i> subsp. <i>cinereum</i>
<i>Eucalyptus blakelyi</i>	<i>Eucalyptus dalrympleana</i> subsp. <i>heptantha</i>
<i>Eucalyptus nicholii</i>	<i>Eucalyptus nova-anglica</i>
<i>Eucalyptus pauciflora</i>	<i>Eucalyptus radiata</i> subsp. <i>sejuncta</i>
<i>Euchiton gymnocephalus</i>	<i>Geranium solanderi</i> var. <i>solanderi</i>
<i>Glycine clandestina</i>	<i>Gonocarpus micranthus</i>
<i>Gonocarpus tetragynus</i>	<i>Haloragis heterophylla</i>
<i>Hardenbergia violacea</i>	<i>Hibbertia cistoidea</i>
<i>Hybanthus monopetalus</i>	<i>Hydrocotyle laxiflora</i>
<i>Hypericum gramineum</i>	<i>Hypoxis hygrometrica</i> var. <i>splendida</i>
<i>Juncus filicaulis</i>	<i>Juncus subsecundus</i>
<i>Juncus usitatus</i>	<i>Kunzea parviflora</i>
<i>Lachnagrostis aemula</i>	<i>Lachnagrostis filiformis</i>

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<i>Leptorhynchus squamatus</i> subsp. A	<i>Lespedeza juncea</i> subsp. <i>sericea</i>
<i>Leucopogon fraseri</i>	<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>
<i>Lissanthe strigosa</i>	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>
<i>Luzula densiflora</i>	<i>Melichrus urceolatus</i>
<i>Melicytus dentatus</i>	<i>Mentha satureioides</i>
<i>Microlaena stipoides</i> var. <i>stipoides</i>	<i>Olearia viscidula</i>
<i>Opercularia aspera</i>	<i>Oxalis exilis</i>
<i>Oxalis perennans</i>	<i>Oxalis radicata</i>
<i>Phyllanthus virgatus</i>	<i>Pimelea curviflora</i> var. <i>divergens</i>
<i>Pimelea glauca</i>	<i>Plantago gaudichaudii</i>
<i>Plantago hispida</i>	<i>Poa labillardieri</i>
<i>Poa sieberiana</i>	<i>Poranthera microphylla</i>
<i>Pteridium esculentum</i>	<i>Pultenaea microphylla</i>
<i>Rhodanthe anthemoides</i>	<i>Rubus parvifolius</i>
<i>Rumex brownii</i>	<i>Schoenus apogon</i>
<i>Scleranthus biflorus</i>	<i>Solenogyne dominii</i>
<i>Sorghum leiocladum</i>	<i>Sporobolus creber</i>
<i>Stackhousia monogyna</i>	<i>Stellaria angustifolia</i>
<i>Stylidium graminifolium</i>	<i>Swainsona parviflora</i>
<i>Themeda australis</i>	<i>Thesium australe</i>
<i>Veronica calycina</i>	<i>Veronica plebeia</i>
<i>Viola betonicifolia</i>	<i>Vittadinia cuneata</i>
<i>Vittadinia muelleri</i>	<i>Wahlenbergia communis</i>
<i>Wahlenbergia planiflora</i> var. <i>longipila</i>	<i>Wahlenbergia planiflora</i> var. <i>planiflora</i>
<i>Wahlenbergia queenslandica</i>	<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>

3. The total species list of the community is considerably larger than that given above, with many species present in only one or two sites or in low abundance. The species composition of a site will be influenced by the size of the site, recent rainfall or drought condition and by its disturbance (including fire) history. The number of species, and the above ground relative abundance of species will change with time since fire, and may also change in response to changes in fire regime (including changes in fire frequency). At any one time, above ground individuals of some species may be absent, but the species may be represented below ground in the soil seed banks or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers. The list of species given above is of vascular plant species; the community also includes micro-organisms, fungi, cryptogamic plants and a diverse fauna, both vertebrate and invertebrate. These components of the community are poorly documented.
4. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is dominated by trees of *Eucalyptus nova-anglica* and occasionally with *E. dalrympleana* subsp. *heptantha*, as a co-dominant. The tree layer is usually 8-20m tall with a sparse cover up to 30%. There are few shrub species present, and none are abundant within the community (Benson and Ashby 2000). Ground cover is usually dense with *Asperula conferta*, *Poa sieberiana*, *Themeda australis*, *Juncus filicaulis*, *Dichondra repens*, *Carex inversa*, *Rumex brownii*, *Acaena ovina* and *Desmodium varians* common. There is some variation in the structure due to different stages of regrowth after clearing or dieback (Benson and Ashby 2000).

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5. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is described in Benson and Ashby (2000) who list species to provide a guide to identification of the community. Care should be taken in the application and interpretation of indicator plant species because of sampling limitations and the reduction in species diversity in degraded sites. In addition, at certain times some species may only be present at a site at some times as a soil seed bank or as dormant bud or tubers.
6. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion occurs primarily in valley flats subject to cold air drainage.
7. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is referable to 'New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalt' (Community 8) and 'New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Sediment' (Community 9) of Benson and Ashby (2000); 'New England Peppermint grassy woodland on sedimentary or basaltic substrates' (VCA 534) of Benson *et al.* (2010). The community may also be referable to parts of 'New England Peppermint Woodland' (RVC14) of Eco Logical Australia (2009) mapped on sediments and basalts, however in the absence of any floristic plot data for RVC14, the relationship between the two assemblages is uncertain. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion belongs to the 'Tableland Clay Grassy Woodlands' class of Keith (2004).
8. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion has been recorded from the local government areas of Armidale Dumaresq, Glen Innes Severn Shire, Guyra, Inverell, Tenterfield and Uralla, and may occur elsewhere in the Bioregion. Stands of New England Peppermint Woodland mapped on basalt and sediments by Eco Logical Australia (2009) within the eastern portion of the Namoi Catchment, within the Walcha and Tamworth Regional local government areas, may also be referable to the community as described above.
9. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion has been extensively cleared for grazing and agricultural development because it often occurs on flat and relatively fertile soils (Benson 1999). For example, within the Guyra mapsheet only 2 300 ha (approximately 11%) of the original distribution remains (Benson and Ashby 2000) and this is indicative of a very large reduction in geographic distribution. Much of the remaining areas are in poor condition, with the understorey dominated by exotic plant species (Benson and Ashby 2000). Disturbed remnants are considered to form part of the community, including where the vegetation would respond to assisted natural regeneration, such as where the natural soil and associated seedbank are still at least partially intact. Clearing has dramatically decreased the extent of occurrence of the community and the resulting fragmentation has made New England Peppermint Woodland more vulnerable to other threatening processes such as weed invasion. 'Clearing of native vegetation' is listed as a Key Threatening Process under the NSW *Threatened Species Conservation Act 1995*.

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10. Weed invasion is a major threat to New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion and a large proportion of remnant stands no longer support a native understorey (Benson and Ashby 2000, Benson *et al.* 2010). The following exotic species have been recorded in the community:

<i>Aira elegantissima</i>	Delicate Hairgrass
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass
<i>Briza minor</i>	Shivery Grass, Small Shivery Grass, Quaking Grass
<i>Bromus brevis</i>	
<i>Bromus hordeaceus</i>	Soft Brome
<i>Centaureum erythraea</i>	Common Centaury
<i>Centaureum tenuiflorum</i>	
<i>Cerastium vulgare</i>	Mouse Ear Chickweed
<i>Cirsium vulgare</i>	Spear Thistle
<i>Conyza sumatrensis</i>	Tall Fleabane
<i>Dactylis glomerata</i>	Cocksfoot
<i>Festuca pratensis</i>	Meadow Fescue
<i>Gamochaeta coarctata</i>	
<i>Holcus lanatus</i>	Yorkshire Fog
<i>Hypochaeris radicata</i>	Catsear, Flatweed
<i>Leucanthemum vulgare</i>	Ox-eye Daisy
<i>Lolium perenne</i>	Perennial Ryegrass
<i>Modiola caroliniana</i>	Red-flowered Mallow
<i>Paronychia brasiliiana</i>	Chilean Whitlow Wort, Brazilian Whitlow
<i>Paspalum dilatatum</i>	Paspalum
<i>Petrorhagia nanteuillii</i>	
<i>Plantago lanceolata</i>	Lamb's Tongues, Plantain
<i>Rosa rubiginosa</i>	Sweet Briar, Eglantine
<i>Rubus ulmifolius</i>	Blackberry
<i>Taraxacum officinale</i>	Dandelion, Pissabed
<i>Trifolium arvense</i>	Haresfoot Clover
<i>Trifolium campestre</i>	Hop Clover
<i>Trifolium glomeratum</i>	Clustered Clover
<i>Trifolium repens</i>	White Clover
<i>Vulpia myuros</i>	Rat's Tail Fescue

11. New England Peppermint (*Eucalyptus nova-anglica*), the dominant species of the community, is highly susceptible to eucalypt dieback and is the species most affected by eucalypt dieback on the New England Tablelands (Nadolny 2008). The causes of dieback are complex, however outbreaks of leaf-eating insects are a major factor since these insects can repeatedly defoliate trees. Between 2008 and 2010, New England experienced the worst outbreak of scarab beetles (*Anoplognathus* spp.) in approximately 25 years (C Nadolny *in litt.* 29 January 2010). New England Peppermints have been severely defoliated over an area extending more than 100 km, from south of Walcha to at least Guyra in the north. Insect outbreaks have been intensified by land use practices such as developed pasture and fertiliser application that increase food availability for insects. Fragmentation and the decline of native insectivores further reduce the community's resilience to dieback (Nadolny 2008).

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12. Climate change may pose an important threat to New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion, including the potential to exacerbate other threats such as weed invasion and dieback. Nadolny (2008, *in litt.* 29 January 2010) suggests that high summer rainfall is favourable for scarab beetles which preferentially feed on *Eucalyptus nova-anglica*, and that regional summer rainfall is predicted to increase. The community is likely to be adversely affected by higher temperatures, particularly warmer winter minimums and fewer frosts, as it generally occupies 'frost hollow' situations at high elevations, and much of its current distribution could be replaced by other communities (Eco Logical Australia 2009). Increased fire frequency and intensity predicted under climate change scenarios could lead to changes in the understorey composition and the shrub layer may also become more prominent. 'Anthropogenic Climate Change' is listed as a Key Threatening Process under the NSW *Threatened Species Conservation Act 1995*.
13. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion continues to be threatened by further clearing of remnants, grazing of the understorey, dieback, pasture improvement and weed invasion. Collectively, these threats are indicative of a very large reduction in ecological function.
14. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is very poorly reserved throughout its range. Less than 3% of the remaining area is thought to occur within the conservation estate (Benson and Ashby 2000, Benson *et al.* 2010). Reserves containing the community include Bolivia Hill, Booroolong, Duval, Imbota and Yina Nature Reserves.
15. New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion provides habitat for a number of threatened plant and animal species listed under the NSW *Threatened Species Conservation Act*, as follows (Benson *et al.* 2010):

<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	Vulnerable
<i>Thesium australe</i>	Austral Toadflax	Vulnerable
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (South-eastern form)	Vulnerable
<i>Phascolarctos cinereus</i>	Koala	Vulnerable
<i>Chthonicola sagittata</i>	Speckled Warbler	Vulnerable

16. The New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion is eligible to be listed as a Critically Endangered Ecological Community as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

Clause 17 Reduction in geographic distribution of the ecological community

The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

- (a) a very large reduction in geographic distribution.

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Clause 19 Reduction in ecological function of the ecological community

The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:

- (a) a very large reduction in ecological function, as indicated by any of the following:
- (d) change in community structure,
- (e) change in species composition,
- (f) disruption of ecological processes,
- (g) invasion and establishment of exotic species,
- (h) degradation of habitat.
- (i) fragmentation of habitat.

Dr Andrea Wilson
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Scientific Committee

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