CLASSIFICATION

International Terrestrial Vegetation Classification (adapted from Faber-Langendoen et al. 2012):

Level of Classification: Association.

IUCN Habitats Classification (version 3.0): 1. Forest / 1.5 Subtropical – Tropical Dry

Biogeographic Realm: Australasian, New South Wales (NSW)

Key references: Defined as plant community ID147 in the NSW vegetation classification and assessment database of Benson et al. 2010. Detailed analysis of plant species composition and regeneration ecology is documented in Curran (2006). Assessment of avifauna for part of the distribution is provided in Holmes (1979). Fauna is described for a key site in (NSW NPWS 2004).

ECOSYSTEM DESCRIPTION

Characteristic Flora and Vegetation

Mid-high to low closed or open forest known as semi-evergreen vine thicket dominated by rich diversity of low trees and shrubs to about 6 m high (Figs. 1 - 3). A full characteristic plant species list is provided in NSW plant community ID147 in Benson et al. (2010) and biological survey information is held on the NSW National Parks and Wildlife Service administrative file 1992/M/3793 (NSW Government archives). Trees include Mock Olive (Notelaea microcarpa var. microcarpa), Wilga (Geijera parviflora), Peach Bush (Ehretia membranifolia) along with Elaeodendron australe var. integrifolium, Ventilago viminalis, Psydrax oleiofolia, Alectryon subdentatus and Alstonia constricta. Some tree species are facultatively deciduous. Emergent trees to 15 m high are often present including White Box (Eucalyptus albens), Silver-leaved Ironbark (Eucalyptus melanophloia), White Cypress Pine (Callitris glaucophylla) and Belah (Casuarina cristata). The shrubs layer may be mid-dense or dense and includes Carissa ovata, Beyeria viscosa, Spartothamnella juncea, Solanum parvifolium, Rhagodia parabolica, Olearia elliptica, Senna coronilloides, Indigofera adesmiifolia, Indigofera brevidens, Breynia cernua, Solanum semiarmatum, Cassinia laevis, Myoporum montanum, Capparis lasiantha, Pimelea neo-anglica and Phyllanthus subcrenulatus. Vines are common and include Wonga Vine (Pandorea pordanora), Parsonsia eucalyptophylla, Clematis microphylla var. microphylla, Cayratia clematidea and Jasminum lineare. Mistletoes include Lysiana exocarpi, Lysiana subfuscata and Amyema miraculosum. The ground cover is mid-dense in open areas or sparse under dense tree or shrub canopies. Common grass species include Austrostipa verticillata, Leptochloa asthenes, Poa sieberiana var. hirtilli, Elymus scaber, Panicum queenslandicum var. queenslandicum, Chloris ventriculosa, Austrodanthonia bipartita, Paspalidium gracile and Cymbopogon refractus. The sub-shrub Desmodium brachypodum is often abundant. Forbs include Boerhavia dominii and Dichondra sp. A. Sedges such as Carex inversa may be present along with the rock fern Cheilanthes sieberi subsp. sieberi. Planchonella Hill Nature Reserve contains a population of the NSW restricted small tree Pouteria cotinifolia var. pubescens (Fig. 2). This ecosystem grades into Eucalyptus albens (White Box).
or *Casuarina cristata* (Belah) woodlands. A more complex SEVT community occurs in more tropical climes to the north in Queensland.

**Characteristic Fauna**

Fauna surveys have been undertaken the most complex remaining patch in Planchonella Nature Reserve (NSW NPWS 2004). This area contains one of the few known southern Australian records of the mammal Black-striped Wallaby (*Macropus dorsalis*), an endangered species under the NSW Threatened Species Conservation Act, 1995. Other endangered fauna include the birds Bush Stone-curlew (*Burhinus grallarius*) and the Squatter Pigeon (*Geophaps scripta*). Vulnerable species include Glossy Black-Cockatoo (*Calyptorhynchus lathami*), Turquoise Parrot (*Neophema pulchella*), Brown Treecreeper (*Climacteris picumnus*), Speckled Warbler (*Pyrholaemus sagittatus*), Black-chinned Honeyeater (*Melithreptus gularis gularis*) and the Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*). Some species reach their inland limit including the White-browed Scrubwren (*Sericornis frontalis*), the Rainbow Lorikeet (*Trichoglossus haematodus*) and the Chocolate Wattled Bat (*Chalinolobus morio*). Others reach their eastern Australian limit including the White-winged Fairy Wren (*Malurus leucopterus*), Singing Honeyeater (*Lichenostomus virescens*), Spotted Bowerbird (*Chlamydera maculata*) and the Black-faced Woodswallow (*Artamus cinereus*). Other common bird species include Wedge-tailed Eagle (*Aquila audax*), Nankeen Kestrel (*Falco cenchroides*), Bar-shouldered Dove (*Geopelia humeralis*), Redwinged Parrot (*Aprosmictus erythropterus*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Southern Boobook (*Ninox boobook*), Sacred Kingfisher (*Todiramphus sanctus*), White-throated Treecreeper (*Cormobates leucophaea*), and the Spinycheeked Honeyeater (*Acanthagenys rufogularis*).

Reptiles and amphibians species such as the Soft-tailed Gecko (*Diplodactylus williamsi*), Bynoe’s Gecko (*Heteronotia binoei*), Green Tree Frog (*Litoria caerulea*), Lace Monitor (*Varanus varius*), Eastern Brown Snake (*Pseudonaja textilis*), Shingleback Lizard (*Trachydosaurus rugosus*) and skinks including *Ctenotus robustus*, *Anomalopus leuckartii*, *Carlia vivax*, *Lygisaurus foliorum*, *Cryptoblepharus virgatus*, and *Morethia boulengeri*.

The dense vegetation of the vine thicket provides a refuge for smaller macropods such as the Red-necked Wallaby (*Macropus rufogriseus*) and the Swamp Wallaby (*Wallabia bicolor*) (Henderson, 1997). Other mammals occupying the Reserve include the Common Brushtail Possum (*Trichosurus vulpecula*), Eastern Grey Kangaroo (*Macropus giganteus*), Gould.s Long-eared Bat (*Nyctophilus gouldi*) and Lesser Long-eared Bat (*Nyctophilus geoffroyi*).
Supplementary material
Figure S10. 1. Aerial view of the largest known stand of Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket in New South Wales on Derra Derra Ridge near Bingara, North Western Slopes of NSW, south-eastern Australia, 1994, J.S. Benson.

Figure S10. 2. Semi-evergreen vine thicket dominated by the restricted small tree *Pouteria cotinifolia* var. *pubescens* in Planchonella Hill Nature Reserve, near Yetman, north-west NSW, 2007, J. Benson.

Figure S10. 3. Canopy of *Notelaea microcarpa–Geijera parviflora–Ehretia membranifolia* semi-evergreen vine thicket on Porcupine Hill, near Gunnedah, New South Wales, 2004, T. Curran.
Abiotic environment and Distribution

Dry subtropical SEVT occurs on high nutrient, chocolate brown or black loam soils often derived from basalt on flats, rises, or low hill landforms. Altitude of occurrences ranges from 450-700m a.s.l. The climate is warm to hot with low to moderate rainfall averaging 570-750mm p.a across the distribution. Mean maximum monthly temperatures range from 32-35°C with mean minimum monthly temperatures 0.2-4.6° C (Curran 2006). Heatwaves of over 40°C occasionally occur. Therefore, this "dry" relictual rainforest has adapted to limited precipitation and summer heat of inland mountain range slopes in south-eastern Australia. The limited extent of this ecosystem may be explained by contractions of extent during the Pleistocene ice ages including the last severe ice age that reached its maximum c 20,000 B.P. Fire history may also explain its rarity and location of occurrences. Frequent and intense fire would degrade or eliminate this rainforest leading to replacement by fire-tolerant *Eucalyptus*-dominated woodlands. Today, Eucalyptus woodland surrounds most patches of this dry rainforest.

Little is known about the impacts on this ecosystem of Aboriginal burning practices prior to European settlement in south-eastern Australia in 1788.

This southern type of sub-tropical vine thicket occurs on the western slopes of the Great Dividing Range in south-eastern Australia in the State of New South Wales in the Brigalow Belt South and Nandewar Australian Bioregions (Floyd 1990, Curran 2006, Benson et al. 1996). Its distribution is bounded by the towns of Gunnedah in the south, Yetman in the north and Narrabri and Moree in the west. SEVT stands in the Yalloroi - Warialda region were surveyed by Holmes (1979). By that time it was considered that most of the original extent had been cleared based on field observations of its current extent in relation to suitable substrates and landforms (Holmes 1979). Locations south of the study area in Holmes (1979) were identified in Benson et al. (1996) using 1994 aerial photographs and light aircraft aerial survey. The 1994 aerial survey took place one year before land clearing control laws were introduced in New South Wales.

The estimated pre-industrial (pre-1750) and pre-European settlement (1788) extent of the ecosystem over its full distribution is estimated to have been in the order of 12000 hectares (Benson et al. 2010). This is based on areas of cleared land that contain basalt substrate with topographical features similar to current remnants. It is estimated that less than 20% of the pre-1750 extent remains. The current extent is estimated as being approximately 2000 hectares based a combination of surveys and mapping covering the distribution (summarised in Benson et al. 2010). Holmes (1979) documents patches in the north – less than 500 ha; Benson et al. (2006) document between 500-1000 ha in the mid-south area; Peasley (2001) maps 97 hectares east of Moree; Cannon et al. (2002) map some areas near Narrabri; small areas exist near Gunnedah at its southern-most distribution based on survey data in Curran (2006). Most occurrences other than the largest stands at Derra Derra Ridge and Planchonella Hill (Fig. 4) are one to a few hectares in size. These small patches are vulnerable to clearing, grazing by domestic stock and feral goats.

Overall, there are less than 25 occurrences of remaining. 12 are in the north to central parts of the distribution (Fig. 4), a few occur in the south near Gunnedah and a few to the west near Narrabri and Moree.

Threatening Processes

Most of this community has been cleared because it occurs on high nutrient soils on undulating terrain suitable for grazing and cropping, particularly for growing wheat. Domestic stock and feral animal (goats) graze the understorey of remnants outside conservation reserves and this effects the regeneration of some tree and shrub species. Extended drought and increased temperatures due to climate change could negatively impact on he regeneration and survival of some characteristic plant species. Invasive weeds include the Prickly Pear species *Opuntia stricta* and *Opuntia tomentosa*. Rare stochastic disturbance events such as wild fire would kill rainforest species and change the functioning of the ecosystem.
Protected area status: Two conservation reserves contain this ecosystem. 176 ha are mapped in Planchonella Hill Nature Reserve (Hunter 2006) and 320 ha are mapped in Bingara State Conservation Area (Derra Derra Ridge) (Hunter 2009). In total 496 ha are protected representing 4% of original extent and 25% of the current extent (Benson et al. 2010).

Conservation ecosystem listings
Listed as ENDANGERED as part of a Threatened Ecological Community under the Australian Government Environmental Protection and Biodiversity Conservation Act 1999: *Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.*
Figure S10. 4. Northern and central occurrences of *Mock Olive - Wilga - Peach Bush - Carissa dry subtropical semi-evergreen vine thicket* mapped by Holmes (1979) and Benson et al (1996) in New South Wales, Australia. Derra Derra Ridge and Planchonella Hill contain the largest areas.

**Ecosystem collapse**

For assessment of criteria A and B, the vine thicket ecosystem was assumed to collapse when its mapped distribution declines to zero due to conversion to agriculture.

**ASSESSMENT**

**Summary**

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**Criterion A**

**Current and future decline.** The rate of extent change over 50 years is difficult to accurately establish from existing, disparate mapping. A range of vegetation maps and field observations from the late 1970s to 2002 indicate continued loss of extent due to land clearing, however, the rate of decline has not yet been quantified. Land clearing may have no slowed down due to legislative changes in NSW. The status under Criteria A1 and A2 is Not Evaluated.

**Historic decline.** Vegetation surveys mapping locations (Holmes 1979, Benson et al. 1996, Peasley 2001) infer loss of >70% of the pre-1750 extent, supported by the level of clearing of mapped landforms of similar soils and topography within the extent of occupancy of the ecosystem. The status under criterion A3 is Endangered.

**Criterion B**

**Extent of Occurrence.** Not Evaluated.

**Area of Occupancy.** There are less than 25 total occurrences in 10 x 10 km cells, of which less than 10 contain more than 1% vine thicket. There is observed/suspected continuing degradation of spatial extent and biotic interactions (Criteria B2a. i & iii) caused by small-scale land clearing and grazing of the understorey / ground cover that is inhibiting regeneration of some characteristic plant species and affecting vegetation structure. The small area of occupancy, combined with continuing degradation supported Endangered status under criterion B2.a. i & iii.

**Number of locations.** Not Evaluated.

**Criterion C**

Not Evaluated, although there is observational evidence of soil erosion at some sites.

**Criterion D**

Not Evaluated, although there is observational evidence of negative impacts of domestic stock and feral animal grazing on the regeneration of character plant species.

Supplementary material

Criterion E

Data Deficient, no model available for quantitative analysis of ecosystem collapse.

REFERENCES


