

RIVERINE RAINFOREST REMNANTS IN THE MANNING VALLEY

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ABSTRACT

Three previously unrecognized riverine rainforest remnants in the Manning Valley, northern coastal New South Wales, are noted. A preliminary list of tree species is given and some management problems are discussed. Tree species from previously documented riverine rainforests at Wingham and Coocumbac Island Nature Reserve, Taree, are listed for comparison.

INTRODUCTION

A major review of rainforest remaining in New South Wales is provided by Adam (1987). Approximately 250,000 ha of rainforest in all categories survives in New South Wales (Pople & Cowley, 1982), and of this some 192,400 ha remains structurally intact (Floyd, 1987).

The surviving riverine rainforest (lowland subtropical rainforest) in New South Wales represents little more than 100 ha of the total rainforest resource, and is distributed among several geographically disjunct and vegetationally isolated remnants. This figure is an underestimate of the total riverine rainforest but additional remnants are constituted largely by narrow riparian relic fringes and small tree clusters with little community or structural integrity.

Significant riverine rainforest remnants occur at Stotts Island Nature Reserve (approx. 50 ha) in the Tweed River, northeast of Murwillumbah, Pimlico Island in the lower Richmond River, Susan Island near Grafton, Jarrett Park at Bellingen and Shark Island, near Stuarts Point, in the lower Macleay. All have been subject to canopy damage and invasion by exotic weeds, and modification or loss of understorey complexity, species diversity and microhabitat.

Between the Macleay and Hunter River valleys, the once extensive subtropical rainforests of the fertile floodplains have been cleared and only two remnants (Coocumbac Island near Taree and "Wingham Brush" at Wingham) have been recorded. A number of additional, yet previously unrecognized and undocumented, remnants do survive elsewhere in the Manning valley. These occur as both relic patches and narrow river fringes surviving from past agricultural clearing.

A preliminary list of the tree species recorded to date from the three most substantial of these sites is given in Table 1. These are two sites near Lansdowne village on the Lansdowne River, a northern tributary of the Manning River, and a third remnant west of Mt George township on the middle reaches of the Manning River. Comparative tree records for Coocumbac Island Nature Reserve and "Wingham Brush" are also presented in Table 1.

None of the documented remnants in the Manning represent duplications: rather they are floristic relics of the original mosaic and gradation of the extensive rainforest that once occupied the valley floodplain. However, the relict vascular plant vegetation, is an insufficient basis from which to reconstruct past complexity and previous distribution of sub-alliances and individual taxa.

DISCUSSION

Two remnants of riverine rainforest survive on the banks of the Lansdowne River, north of Taree. The larger of the two, locally known as the "Lansdowne Recreation Reserve", is approximately 4 ha in size and is a Crown Reserve dedicated for the preservation of flora and fauna and public recreation (Reserve No. 50557, notified 1915) (National Map Reference 9434-563825). The rainforest canopy has been heavily degraded with the retained projective foliage coverage being less than 40% over the greater part of what was once rainforest. Trust management to date appears to have exacerbated the disturbance, and little prospect for long-term retention of the remnant remains.

Mature individuals of Yellow Pear-fruit *Mischocarpus pyriformis*, Black Apple *Planchonella australis*, Rough-leaved Elm *Aphananthe philippinensis* and Whalebone Tree *Streblus brunonianus* numerically dominate the trees retained but it is unknown if this is an artefact of past tree felling or a true reflection of past dominance. The very common occurrence and numerical dominance by *M. pyriformis* at this site is unusual as elsewhere in the Manning it is restricted to littoral rainforest where it is uncommon. Its presence may be associated with high water salinity of the Lansdowne River at this point, and with sandy soil at the site (Floyd pers. comm.), though the presence of otherwise littoral rainforest-restricted arboreal fauna (eg. the tree ant *Polyrhachis pilosa*) suggests additional influences on the distribution of various biotic components. Intolerance to salinity possibly explains the absence here of both Weeping Lilly-Pilly *Waterhousea floribunda* and Water Gum *Tristaniopsis laurina*, which occur at the second Lansdowne remnant. There two species are otherwise dominants often in single species stands along riparian fringes of the upper valley floodplain.

A distinctive physical feature of the rainforest reserve is the presence of a central, low-lying, tidally-inundated area allowing the penetration of River Mangrove *Aegiceras corniculatum* and accounting for the occurrence of Pointed Boobialla *Myoporum acuminatum* (fig. 1).



Figure 1 River Mangrove *Aegiceras corniculatum* intrusion within the larger of the two Lansdowne riverine rainforest remnants.

Management problems are substantial. Weed infestation is primarily restricted to *Tradescantia albiflora* and *Lantana camara* but the latter possesses some qualities conducive to vegetation protection and the regeneration of rainforest species (Williams 1984) and its removal for aesthetic reasons alone may be ill-considered. The remnant requires an active regeneration program if it is to survive. The recent construction of a walking trail has aggravated management problems by giving access to the one remaining and relatively undisturbed area of rainforest. Fires have been lit along rainforest fringes and mechanical clearance of lantana has been undertaken with insufficient consideration of the impacts of the resultant exposure of the rainforest core area.

The second, and smaller (approximately 1 ha), of the two Lansdowne remnants is on privately owned land and is located 2 km WSW (Nat. Map Ref. 9434-537828) of Lansdowne village (figs 2,3). Unlike the larger remnant it is not subject to tidal influence although it is understood to have been so prior to the construction of a small downstream weir earlier this century (Forrest, personal communication). The present floristic composition does not appear to support this, unless the present community reflects successional recruitment or artificial modification (through land use) post-dating the construction of the weir. Although smaller than the Lansdowne Recreation Reserve remnant, this site has a greater number of species (50 versus 36). As in all the sites surveyed a number of these species are represented by either solitary mature individuals only, or by relatively young plants that represent recently arrived specimens which whilst capable of germinating, may fail to contribute to the canopy layer or reproduce.

While possessing some tree species that are common in the larger remnant (eg. *Streblus brunonianus* and *Aphananthe philippinensis*), this second remnant is otherwise closely related to the submontane warm temperate and subtropical rainforests of the Lansdowne-Comboyne Escarpment less than 4 km to the north. The proportion of species classically associated with largely warm temperate rainforests at higher altitudes (eg. *Doryphora sassafras*, *Ceratopetalum*



Figure 2 Interior section of the smaller riverine rainforest remnant at Lansdowne. Debris (centre) in small tree illustrates approximate peak flood level within the site.

apetalum, *Sloanea australis* and *Daphnandra micrantha*) is significant. All are represented by mature examples and it is difficult to explain their occurrence here, and the almost complete absence of these and related taxa at the other sites in Table 1. Neither of the Lansdowne remnants possesses the pronounced dry rainforest component found at Cooembac Island, Wingham Brush and Coopers Brush.

Management problems at this remnant are restricted to limited weed invasion by Camphor Laurel *Cinnamomum camphora* and the Small-leaved Privet *Ligustrum sinense* which is more widely spread.

The third remnant riverine rainforest described here is located approximately 3 km west of Mt George township (Nat. Map Ref. 9334 - 197724) and is known as Coopers Brush. This composite riverine subtropical - dry rainforest remnant occurs on steep scree slopes and alluvium is larger (approx. 20 ha) than those in the Lansdowne area. Prior to European settlement and agricultural clearing the riverine rainforest extended to the adjoining bank of the Manning River. There is no distinct delineation between the riverine and dry rainforest elements, and the two interdigitate in response to environmental and topographic gradients and influences. As at Wingham Brush and Cooembac Island, large examples of the Moreton Bay Fig *Ficus macrophylla* form an emergent layer above the upper canopy stratum.

To date Coopers Brush has suffered little disturbance other than very limited and localized infestation by Climbing Senecio *Senecio mikanoides*, Madiera Vine *Anredera cordifolia* and *Tradescantia albiflora*, and cattle ingress in the alluvial fringe. This is a significant improvement over the physical and biotic degradation shown in riverine rainforests elsewhere in New South Wales.

There are extensive riverine remnants west of Wingham and Mt George townships (eg. Knorrit & Cundle Flat) but these survive primarily as narrow bands along the banks of the Manning River. Some rainforest vegetation is regrowth establishing after the initial phase of clearing.

In the Lower Manning the few surviving riparian relics are more closely related to littoral rainforests developed discretely along the adjoining coastline. These upper estuary - lower floodplain remnants are dominated by, or consist exclusively of Tuckeroo *Cupaniopsis anacardioides* and usually intergrade with mangrove and Swamp Oak *Casuarina glauca* communities. No detailed mapping of the remaining riverine rainforest vegetation has been undertaken but such a survey could provide useful information for the conservation of the surviving pockets.

There are few published data on the fauna of the riverine rainforests within the Manning, although a review of plant and animal communities within the rainforests of the Manning catchment generally has been undertaken recently (Williams in prep.). Some site-specific invertebrate faunas are discussed in wider surveys (Williams & Williams 1983) or are incorporated into taxonomic revisions (Barker 1988). The invertebrate faunas of riverine rainforests elsewhere in New South Wales remain largely unknown (Williams 1990).

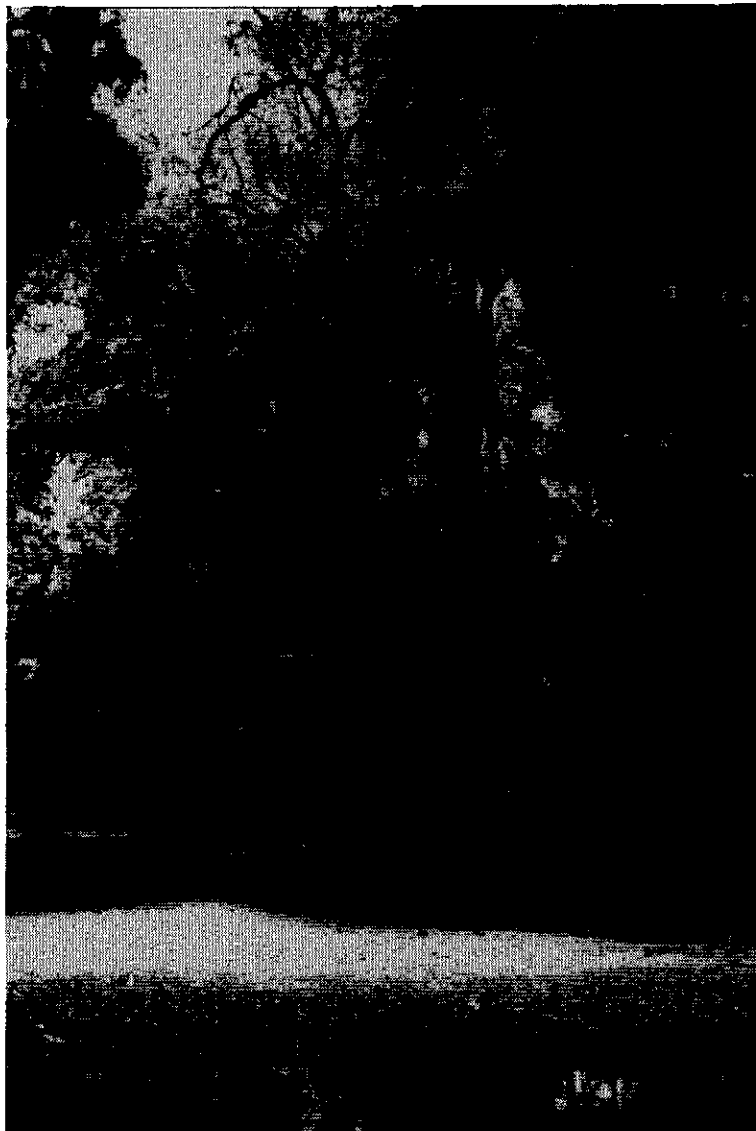


Figure 3 Interior section within the smaller of the two Lansdowne remnants.

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Table 1 Preliminary Species List - Trees.

Key: 1. Lansdowne Recreation Reserve; 2. site "2" Lansdowne; 3. Cooper's Brush; 4. Wingham Brush; 5. Coocumbac Island Nature Reserve.

Taxon	1	2	3	4	5
ARECACEAE					
<i>Archontophoenix cunninghamiana</i>		x		x	
ALANGIACEAE					
<i>Alangium villosum</i>			x	x	
APOCYNACEAE					
<i>Alyxia ruscifolia</i>			x		
ARALIACEAE					
<i>Polyscias elegans</i>			x	x	
BORAGINACEAE					
<i>Ehretia acuminata</i>			x	x	
CAPPARACEAE					
<i>Capparis arborea</i>			x	x	x
CAPRIFOLIACEAE					
<i>Sambucus australasicus</i>			x		
CELASTRACEAE					
<i>Cassine australia</i>		x	x	x	
CUNONIACEAE					
<i>Ceratopetalum apetalum</i>		x			
<i>Schizomeria ovata</i>	x				
EBENACEAE					
<i>Diospyros australis</i>	x		x	x	
<i>Diospyros pentamera</i>		x	x	x	x
ELAEOCARPACEAE					
<i>Elaeocarpus obovatus</i>	x	x	x	x	x
<i>Sloanea australis</i>		x			
EPACRIDACEAE					
<i>Trochocarpa laurina</i>		x			

Taxon	1	2	3	4	5
EUPHORBIACEAE					
<i>Baloghia lucida</i>			x	x	
<i>Claoxylon australe</i>			x	x	x
<i>Cleistanthus cunninghamii</i>		x	x	x	
<i>Croton insularis</i>			x		
<i>Croton verreauxii</i>	x	x	x		
<i>Drypetes australa</i>	x		x		
<i>Glochidion ferdinandi</i>	x	x		x	
<i>Mallotus philippensis</i>			x	x	x
EUPOMATIACEAE					
<i>Eupomatia laurina</i>			x	x	x
FLACOURTIACEAE					
<i>Scolopia braunii</i>	x	x	x	x	x
ICACINACEAE					
<i>Citronella moorei</i>			x	x	
<i>Pennantia cunninghamii</i>				x	
LAURACEAE					
<i>Beilschmiedia elliptica</i>				x	
<i>Beilschmiedia obtusifolia</i>				x	
<i>Cinnamomum oliveri</i>				x	
<i>Cryptocarya erythroxylon</i>		x		x	
<i>Cryptocarya glaucescens</i>		x			
<i>Cryptocarya meisneriana</i>		x		x	
<i>Cryptocarya microneura</i>	x	x	x	x	
<i>Cryptocarya obovata</i>		x	x	x	x
<i>Endiandra discolor</i>	x	x			
<i>Endiandra muelleri</i>	x				
<i>Litsea lefeana</i>	x				
<i>Litsea reticulata</i>			x	c	
<i>Neolitsea australiensis</i>			x		
<i>Neolitsea dealbata</i>	x	x	x	x	
MALVACEAE					
<i>Hibiscus heterophyllus</i>		x			x
MELIACEAE					
<i>Dysoxylum fraserianum</i>			x	x	x
<i>Dysoxylum rufum</i>	x		x	x	
<i>Melia azedarach</i> var. <i>australasica</i>	x			x	x
<i>Synoum glandulosum</i>		x			
<i>Toona australis</i>				x	
MIMOSACEAE					
<i>Acacia melanoxylon</i>	x	x		x	
<i>Pararchidendron pruinatum</i>			x	x	x
MONIMIACEAE					
<i>Daphnandra micrantha</i>		x	x	x	
<i>Doryphora sassafras</i>		x			
<i>Wilkiea huegeliana</i>	x	x	x	x	
MORACEAE					
<i>Ficus macriophyllau</i>	x	x		x	
<i>Ficus macrophylla</i>	x		x	x	x
<i>Ficus obliqua</i>		x			x
<i>Ficus rubiginosa</i>			x		
<i>Ficus superba</i> var. <i>henneana</i>				x	x

Taxon	1	2	3	4	5
<i>Ficus watkinsiana</i>					x
<i>Streblus brunonianus</i>	x	x	x	x	x
MYOPORACEAE					
<i>Myoporum acuminatum</i>	x				
MYRSINACEAE					
<i>Rapanea howittiana</i>			x	x	
<i>Rapanea variabilis</i>	x	x			
MYRTACEAE					
<i>Acmena smithii</i>	x	x			
<i>Acmena smithii</i> var. <i>minor</i>			x		
<i>Austromyrtus bidwillii</i>			x	x	
<i>Austromyrtus</i> sp.		x			
<i>Backhousia myrtifolia</i>	x	x			
<i>Backhousia sciadophora</i>			x	x	
<i>Eucalyptus grandis</i>		x		x	x
<i>Lophostemon confertus</i>	x	x			
<i>Rhodamnia rubescens</i>		x	x		
<i>Rhodomyrtus psidioides</i>	x	x			
<i>Syncarpia glomulifera</i>		x			
<i>Syzygium australe</i>	x		x	x	
<i>Stygiium francisii</i>				x	
<i>Tristaniopsis laurina</i>		x		x	
<i>Waterhousea floribunda</i>		x		x	
OLEACEAE					
<i>Notelaea longifolia</i>	x	x	x	x	
<i>Olea paniculata</i>			x	x	x
PITTOSPORACEAE					
<i>Hymenosporum flavum</i>				x	
<i>Pittosporum undulatum</i>			x	x	x
PROTEACEAE					
<i>Stenocarpus salignus</i>			x		
RHAMNACEAE					
<i>Alphitonia excelsa</i>	x	x	x	x	
<i>Emmenosperma alphitonioides</i>				x	
RUBIACEAE					
<i>Canthium</i> sp.		x			
<i>Randia benthamiana</i>					x
RUTACEAE					
<i>Acronychia oblongifolia</i>	x	x		x	
<i>Euodia micrococca</i>		x		x	
<i>Geijera salicifolia</i> var. <i>latifolia</i>			x	x	x
<i>Sarcomelicope simplicifolia</i>			x	x	
SAPINDACEAE					
<i>Alectryon subcinereus</i>	x	x	x	x	x
<i>Alectryon subdentatus</i>			x		
<i>Alectryon tomentosus</i>			x	x	x
<i>Arytera divaricata</i>			x	x	x
<i>Cupaniopsis parvifolia</i>			x	x	
<i>Diploglottis australis</i>			x	x	
<i>Ellatostachys nervosa</i>			x	x	x
<i>Guioa semiglauca</i>	x	x		x	
<i>Mischocarpus australis</i>		x		x	

Taxon	1	2	3	4	5
<i>Mischocarpus pyriformis</i>	x				
<i>Rhysotoechia bifoliata</i>			x	x	x
SAPOTACEAE					
<i>Planchonella australis</i>	x	x	x	x	x
SIMAROUBACEAE					
<i>Guilfoylia monostylis</i>			x	x	
STERCULIACEAE					
<i>Brachychiton acerifolius</i>			x	x	x
<i>Brachychiton discolor</i>				x	x
<i>Commersonia fraseri</i>	x				
<i>Heritiera actinophylla</i>			x	x	x
ULMACEAE					
<i>Aphananthe philippinensis</i>	x	x	x	x	x
<i>Celtis paniculata</i>			x		x
URTICACEAE					
<i>Dendrocnide excelsa</i>			x	x	x
<i>Dendrocnide photinophylla</i>				x	x
VERBENACEAE					
<i>Clerodendron tomentosum</i>	x	x	x	x	x
<i>Gmelina leichhardtii</i>		x			
TOTAL	36	50	62	75	36

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