



## Natural Values of North East NSW

### **NEFA BACKGROUND PAPER**

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The area of north-east New South Wales extends north from the Hunter River to the Queensland border and from the coast west over the Great Dividing Range to take in some of the New England Tablelands, totaling some 8.3 million hectares. (This is the majority of the area covered in the North East NSW Regional Forest Agreement, which extended further south to Gosford).

The climate of the North Coast region varies from sub-tropical on the coast to temperate in the western uplands, it is characterised by warm summers and no dry season. It is the wettest region in New South Wales with an average annual rainfall of more than 1200 mm, which peaks at an average of over 2000 mm/year in the far north-east of the region. Rainfall is greatest in summer and early autumn, and is lowest in winter and spring.

The region encompasses some 416,000 ha of remnant rainforests. At the higher elevations Antarctic Beech cool-temperate rainforest dominates, becoming more restricted to the north. This grades into warm-temperate rainforest on poorer soils and mid elevations. On better soils, and in gullies, at lower elevations this is replaced with sub-tropical rainforest which becomes more restricted to the south. With declining rainfall this grades into drier rainforest forms, often dominated by Hoop Pine. Along the coast littoral rainforest dominates.

Some 75,000 ha of swamps and paperbark forests are scattered around the region, becoming widespread on the floodplains and near the coast. Along the coast around

30,000ha of heathlands and banksia shrublands dominate the old coastal dunes, with mangrove forests and saltmarshes fringing the estuaries.

With decreasing soil fertility and rainfall, and increasing fire, Brush Box begins to dominate as the rainforest grades into wet sclerophyll forests dominated by eucalypts such as Flooded Gum, Dunns White Gum, Tallowwood and Sydney Blue Gum. Dry eucalypt forests with heathy or grassy understories are the dominant vegetation across the region. On the tablelands and in the open valleys, areas of eucalypt woodlands with grassy understories occur.

Over 170 eucalypt forest ecosystems have been identified in the region. Around half the eucalypt forest has been cleared, with some 4,120,000 ha remaining. Much of this has been degraded by logging, grazing, mining, weeds and feral animals. Some is regrowth from past clearing.

In 1998 it was assessed that 31% of the region's eucalypt forests remained in an oldgrowth state, though less remained of the more productive forests with 21% of eucalypt forest ecosystems having less than 10% of their extent remaining as oldgrowth. Logging of larger stands of mapped oldgrowth continued on public lands until 2004, with smaller stands (<10ha) still being logged. On private lands logging of oldgrowth continues, more recently being encouraged by widespread deletion of oldgrowth forest in incorrect remapping for Property Vegetation Plans (Aerial Acquisitions 2010).

North of the Hunter River, in 1999 the Commonwealth identified 17 areas, totalling 512,865 ha, in north-east NSW as satisfying the JANIS criteria for defining "high quality wilderness" (minimum NWI rating of 12 and a minimum size of 8000 hectares). Most wilderness on public land is now protected, though no protection is provided on private lands.

### **Global Significance**

North-east NSW has internationally significant conservation values that single it out as one of the world's strongholds of biodiversity. Its high diversity of threatened species, large number of endemic species, significant populations of species which have declined elsewhere in Australia and importance for migratory fauna, identify it as one of Australia's major refuge areas with the best ability to maintain Australia's declining biodiversity.

This region is the evolutionary hub of the wet sub-tropics, the high number of endemic species this has generated is enhanced by Australia's predominantly northern flora and fauna reaching their southern limits of distribution and the predominantly southern species reaching their northern limits of distribution within the region (this species overlap is, in part, referred to as the Macleay-McPherson Overlap). The region includes an overlap of Tumbunan, Bassian, Torresian and Eyrean zoogeographical influences (NPWS 1994a). As noted by the NPWS (1994a) *"Nowhere else in Australia do so many zoogeographical influences combine"*.

Within Australia, the tropical forests of north-east Queensland and the forests of north-east NSW/south-east Queensland are the principle centres of biodiversity for frogs, birds, mammals and insects (variously Chippendale 1981, CoA 1996, Covacevich and McDonald 1991, DASET 1992, Debus 1992, Dyne 1991, Martin 1984, NPWS 1994a, NPWS 1994b, Pianka and Schall 1984).

North-east NSW/south-east Queensland is one of the three principle areas of floristic diversity in Australia (NPWS 1994b). Martin (1984) notes that for flora the Macleay-McPherson overlap "is particularly rich with some 761 genera in this small area and about 10.6% are endemic." DASET (1992) note that some 260 plant species, representing 131 genera and 63 families, are largely restricted to north-east NSW and far south east Queensland. Chippendale (1981) mapped the distribution of Eucalyptus species in Australia and found that north-east NSW was second only to the Sydney sandstone area for diversity of species. North-east NSW contains about 60% of the plant species found in NSW (NPWS 1994b).

The upper north east encompasses part one of one of Australia's 15 recognised biodiversity hotspots, the 'Border Ranges North and South (Queensland and New South Wales)'. Biodiversity hotspots are areas that support natural ecosystems that are largely intact and where native species and communities associated with these ecosystems are well represented. Areas with many endemic species where the levels of stress or future threat were considered to be high were identified by the Australian Government's [Threatened Species Scientific Committee](#) as hotspots. In relation to the Border Ranges North and South the Environment Australia website notes;

*This sub-tropical and temperate hotspot is one of Australia's most diverse areas - and it is the most biologically diverse area in New South Wales and southern Queensland. It has a variety of significant habitats: subtropical rainforest, wet sclerophyll forest, mountain headlands, rocky outcrops and transition zones between forests.*

*These habitats support a huge variety of bird and macropod species. Many are rare or threatened: the Richmond Bird-wing Butterfly, Fleay's Frog, Hastings River Mouse, Long-nosed Potoroo, Spotted-tailed Quoll, Eastern Bristle Bird, Rufous Scrub-bird and the critically endangered Coxen's Fig parrot. Notable birds such as Albert's Lyrebird and the Paradise Riflebird make their home here, and in the south-east Queensland rainforests live a rich variety of primitive plant species, many of them similar to fossils from Gondwana.*

*This region's high population growth, with associated urban and tourist developments along the coast, is a major cause of habitat loss and fragmentation. Although most remaining natural areas are protected, they are under considerable threat from weeds, fire and recreational use.*

The forests of north-east NSW have been identified as part of one of the world's 35 biodiversity hotspots because of their exceptional species endemism (at least 1,500 endemic plant species, i.e., 0.5% of all known species) and habitat loss (70% or more of an area's primary vegetation cleared) (Williams *et.al.* 2011).

The global significance of the region's rainforests have long been recognised by the inscribing of those reserved in 1986 on the World Heritage List, within what is now Gondwana Rainforests of Australia property. Those rainforests reserved since then have also been assessed as qualifying. Similarly the unique diversity of eucalypt ecosystems within the region have been identified as also warranting inclusion on the World Heritage List. (see **World Heritage Listing**)

North east NSW and south east Queensland's rainforests are considered to be of international significance because: they provide "*an unparalleled record within the subtropical climatic zone of rainforests originating in the Gondwana Cretaceous but surviving the major extinction episode characterising the Cretaceous-Tertiary boundary*" (DASET 1992), they are a secondary (to the Wet Tropics) centre of endemism for Australia with 42 of the 98 genera of primitive flowering plants (NPWS 1994b), they represent "*the most latitudinally, and perhaps aurally, extensive subtropical rainforest in the world*" (DASET 1992) and because the overlapping of southern temperate and northern tropical rainforest flora is only found here (Floyd 1987).

For the full North-East NSW RFA region (south to Gosford) the national *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) identifies 5 Critically Endangered Ecological Communities as occurring, along with one endangered and one vulnerable ecological community.

The EPBC Act lists 43 animals in north-east NSW as nationally threatened, which represents 11% of Australia's threatened animals. These include 8 mammals, 11 birds, 8 reptiles, 10 frogs, 4 fish, and 2 invertebrates. Two animals are classed as critically endangered, 17 as endangered, and 24 as vulnerable to extinction.

There are also 164 plants in north-east NSW listed as nationally threatened, which represents 13% of Australia's threatened plants. Nine plants are classed as critically endangered, 60 as endangered, and 95 as vulnerable to extinction.

Unfortunately, north-east NSW also has the highest number of introduced trees, shrubs, vines and creepers of "*serious threat to native communities*" of anywhere in Australia (A.N.P.W.S. 1991).

Too much has already been lost, all remaining native forests, and other ecosystems, in north east NSW need to be managed to limit impacts and retain or regain natural processes.

## REFERENCES

Aerial Acquisitions (2010) Independent Quality Assurance review of DECCW's Old Growth and Rainforest Private Native Forestry assessment protocols interpretation and implementation. Report prepared for Department of Environment, Climate Change and Water NSW (DECCW).

A.N.P.W.S. - Australian National Parks and Wildlife Service (1991), Plant invasions, the incidence of environmental weeds in Australia, Kowari 2. ANPWS, Canberra.

Chippendale, G.M. (1981), Distribution Density of Eucalyptus Species in Australia, Search, Vol. 12, 5: 131-133.

CoA, Commonwealth of Australia. (1996), Australia: State of the Environment 1996. CSIRO, Collingwood.

Covacevich, J. and McDonald, K.R. (1991). Frogs and reptiles of tropical and subtropical eastern Australian rainforests: distribution patterns and conservation. In *The Rainforest Legacy*, Australian National Rainforests Study, Vol. 2, eds. G. Werren and P. Kershaw. Aust. Heritage Comm. Aust. Govt. Publ. S., Canberra. pp 281-309.

DASET - Department of the Arts, Sport the Environment and Territories (1992), Nomination of The Central Eastern Rainforests of Australia by the Government of Australia for inscription in the World Heritage List. Unpublished report by DASET.

Debus, S.J.S. (1992), A survey of diurnal raptors in north-east New South Wales, 1987-1990. *Aust. Birds* 25,3:67-77.

Dyne, G.R. (1991), Earthworm fauna of Australian rainforests. In *The Rainforest Legacy, Australian National Rainforests Study, Vol. 2*, eds. G. Werren and P. Kershaw. Aust. Heritage Comm. Aust. Govt. Publ. S., Canberra. pp 335-343.

Environment Australia (1999) North East NSW Wilderness Report, Upper North East and Lower North East CRA Regions. A project undertaken for the Joint Commonwealth NSW Regional Forest Agreement Steering Committee as part of the NSW Comprehensive Regional Assessments Project number NA33/EH

Floyd A.G. (1987) The status of rainforests in northern New South Wales. In *The Rainforest Legacy, Australian National Rainforest Study, vol. 1*. Australian Heritage Commission, AGPS Canberra.

Martin, H. (1984), Australian phytogeography. In *Vertebrate zoogeography and evolution in Australasia, animals in space and time*, eds. M. Archer and G. Clayton. Hesperian Press, Carlisle, West. Aust. pp 17-30.

NPWS (1994a) Fauna of North-east NSW Forests. North East Forests Biodiversity Study Report No.3, unpublished report, NSW National Parks and Wildlife Service

NPWS (1994b) Flora of North-east NSW Forests. North East Forests Biodiversity Study Report No.4, unpublished report, NSW National Parks and Wildlife Service

Pianka, E. and Schall, J. (1984). Species densities of Australian vertebrates. In *Vertebrate Zoogeography and evolution in Australasia, animals in space and time*, eds. M. Archer and G. Clayton. Hesperian Press, Carlisle, West. Aust. pp 119-124.

Williams, K.J., Ford, A., Rosauer, D., De Silva, N., Mittermeier, R., Bruce, C., Larsen, F.W., Margules, C., 2011. Forests of East Australia: the 35th biodiversity hotspot. In: Zachos, F.E., Habel, J.C. (Eds.), *Biodiversity Hotspots: Distribution and Protection of Conservation Priority Areas*. Springer-Verlag, Berlin, pp. 295–310.