SECTION 62 PERMIT ASSESSMENT

Guideline 2

DEFINITION OF A RAINFOREST

Rainforest is an umbrella term describing a broad range of vegetation community types in the Wet Tropics. In general, rainforests are closed, moisture loving communities of closely spaced trees distinguished from other closed canopy forests by the prominence of life-forms such as epiphytes and lianes, by the absence of annual herbs or grasses on the forest floor and by their floristic complexity.

Different types of rainforest are found in the Area. The differences relate very strongly to moisture and temperature gradients, both spatially and seasonally. The effects of soil type, soil drainage and wind exposure are also important.

Webb (1978) has provided a classification of rainforest communities in Australia, 16 structural types of rainforest are recognised within the Area consisting of 30 broad community types (Table 1). This classification has worldwide applicability being based on structural features (tree layers, evenness of canopy outline, relative crown depths and shapes), physiognomic features (leaf size, type and deciduousness, colour and texture of bark, buttressing) and special life forms (palms, ferns, epiphytes, vines). In so far as this classification applies to the wet tropics, the primary division is into leaf sizes (mesophyll >12.5cm long, notophyll 7.5-12.5cm long and microphyll 2.5-7.5cm long).

The Authority currently accepts rainforests as including types 1 to 13 of Tracey & Webb (1975) and types 25, 26 and 27 of Olsen (1993). Descriptions of these rainforest vegetation types are provided (Table 1), along with descriptions of the non-rainforest vegetation communities occurring in the Area (i.e. types 14 to 23 inclusive).

The Wet Tropics possesses four broad rainforest categories corresponding to the Area's tropical, subtropical, temperate and monsoon climatic zones.

Tropical rainforest types:	1a, 1b, 2a, 2b, 3a & 3b
Subtropical rainforest types:	5a, 5b, 6, 7a, 7b, 8 & 25
Temperate rainforest types:	9, 10 & 26
Monsoon rainforest types:	1c, 4, 11 & 27

The main reason why 'dry' monsoon rainforests are still rainforests despite their marked difference from the wetter rainforests is that they also have a closed canopy, and many plant genera are common to both. These monsoon rainforest types are found in patches on moist well-drained soils, such as along watercourses (1c) and in situations which form a fire-shadow such as deep gullies (4) and rocky outcrops (11) amongst a matrix of open eucalypt forests and woodlands.

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Also included as successional rainforest categories are communities consisting of eucalypts and/or acacias which occur as scattered emergents above a well-developed rainforest canopy or understorey and below which the sclerophyll component is unable to regenerate and fire is unable to penetrate (eg types 12 & 13).

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TABLE 1

VEGETATION OF THE WET TROPICS OF QUEENSLAND WORLD HERITAGE AREA

Rainforest Vegetation Types

A. Rainforests and Vine Thickets (types 1 to 13 plus types 25, 26 & 27)

Mesophyll Rainforest Types		
1a	Complex Mesophyll Vine Forest	Very wet & wet lowlands and foothills on basalts, basic volcanics, mixed colluvium foot-slopes and riverine alluvia.
1b	Complex Mesophyll Vine Forest	Very wet & wet cloudy uplands on basalts.
1c	Complex Mesophyll Vine Forest	Moist & dry lowlands on riverine levees (gallery forests).
2a	Mesophyll Vine Forest	Very wet & wet lowlands and foothills on granites and metamorphics.
2b	Mesophyll Vine Forest	Very wet & wet lowlands on beach sands.
3a	Mesophyll Vine Forest with Dominant Palms	Very wet lowlands, feather-leaf (*Archontophoenix*) palm swamps on basaltic, granitic and alluvial soils.
3b	Mesophyll Vine Forest with Dominant Palms	Very wet lowlands and lower foothills, fan-leaf (*Licuala*) palm swamps on metamorphics and granites with seasonally impeded drainage.
4	Semi-Deciduous Mesophyll Vine Forest	Moist & dry lowlands and foothills on granites and metamorphics.
Notophyll Rainforest Types		
5a	Complex Notophyll Vine Forests	Cloudy wet highlands on very limited areas of basalt and basic rocks.
5b	Complex Notophyll Vine Forests	Moist & dry lowlands, foothills and uplands on basalts.
6	Complex Notophyll Vine Forests (with emergent *Agathis robusta*)	Moist foothills and uplands on granites and metamorphics.
25	Notophyll Vine Forest (with *Araucaria cunninghamii*)	Moist foothills and uplands on granites.
27	Notophyll Semi-Evergreen Vine Forest	Moist & dry foothills and uplands on granites and metamorphics.
7a	Notophyll Vine Forests (rarely without *Acacia* emergents)	Moist lowlands and foothills on granites and metamorphics.
7b	Notophyll Vine Forests (rarely without *Acacia* emergents)	Moist & dry lowlands on beach sands.
8	Simple Notophyll Vine Forest (often with *Agathis microstachya*)	Cloudy wet & moist uplands and highlands on granites, metamorphics and acid volcanics.
Microphyll Rainforest & Thicket Types		
26	Low Microphyll Vine Forest (often with *Araucaria cunninghamii*)	Moist & dry foothills and uplands on granites.

9	Simple Microphyll Vine-Fern Forest (often with *Agathis atropurpurea*)	Cloudy wet highlands on granites.
10	Simple Microphyll Vine-Fern Thicket	Cloudy wet & moist windswept topslopes of uplands and highlands on granites.
11	Deciduous Microphyll Vine Thicket	Dry lowlands and foothills on granite boulders.
Rainforests with Acacia Emergents and Codominants		
12a	Vine forests characterised by *Acacia aulacocarpa.*	Very wet and wet foothills, uplands and highlands on granites and metamorphic ridges (with 2a, 6).
12b	Vine forests characterised by *Acacia cincinnata, Acacia polystachya, Acacia aulacocarpa.*	Wet foothills on metamorphics (with 2a, 6).
12c	Vine forests characterised by *Acacia mangium, Acacia aulacocarpa.*	Very wet and wet lowlands and foothills on metamorphics (with 2a).
12d	Vine forests characterised by *Acacia melanoxylon, Acacia aulacocarpa.*	Cloudy wet uplands and highlands on a wide range of volcanic parent materials (with 9, 8, 5a).
Rainforests with *Eucalyptus, Corymbia* and *Acacia* Emergents and Codominants		
13a	Vine forests with *Eucalyptus pellita, Corymbia intermedia, Corymbia tessellaris, Acacia aulacocarpa, Acacia cincinnata, Acacia mangium, Acacia flavescens* emergents and codominants.	Very wet and wet lowlands and foothills on most parent materials other than basalts (with 2a).
13b	Vine forests with *Corymbia torelliana, Eucalyptus tereticornis, Corymbia intermedia, Eucalyptus pellita, Acacia aulacocarpa, Acacia cincinnata, Acacia polystachya* emergents and codominants.	Moist foothills and uplands on most parent materials other than basalts (with 6, 8).
13c	Vine forests with *Eucalyptus grandis, Acacia melanoxylon, Acacia aulacocarpa* emergents and codominants.	Wet and cloudy wet uplands on granites and acid volcanics (with 2a, 8, 9).
13d	Vine forests with *Eucalyptus tereticornis, Corymbia tessellaris, Corymbia intermedia, Acacia aulacocarpa, Acacia flavescens* emergents and codominants.	Wet and moist foothills on granites and basic volcanics (with 1a, 2a).
13e	Vine forests with *Syncarpia glomulifera, Corymbia intermedia, Eucalyptus pellita, Eucalyptus tereticornis, Acacia aulacocarpa, Acacia mangium* emergents and codominants.	Very wet and wet lowlands and foothills on granites, metamorphics and acid volcanics (with 2a).
13f	Vine forests with *Syncarpia glomulifera, Corymbia intermedia, Lophostemon confertus, Allocasuarina torulosa, Banksia integrifolia* emergents and codominants.	Wet to moist uplands and highlands on granites (with 8, 9).

Non Rainforest Vegetation Types

B. Open Sclerophyll Forests & Woodlands (types 14 to 16)

Tall Open Forests and Tall Woodlands		
14a	Tall open forest with *Eucalyptus grandis, Corymbia intermedia, Acacia melanoxylon, Lophostemon confertus.*	Cloudy moist uplands and highlands on granites and acid volcanics.
14b	Tall open forest with *Eucalyptus resinifera, Eucalyptus acmenoides, Corymbia intermedia, Eucalyptus cloeziana, Syncarpia glomulifera, Allocasuarina torulosa, Callitris macleayana.*	Moist uplands and highlands on granites and acid volcanics.
14c	Tall open forest and tall woodland with *Eucalyptus tereticornis, Corymbia intermedia, Eucalyptus phaeotricha, Angophora floribunda, Allocasuarina torulosa.*	Moist uplands and highlands on basalt.
14d	Tall open woodland with *Corymbia intermedia, Allocasuarina torulosa, Lophostemon suaveolens.*	Moist uplands on red and yellow earths from a range of parent materials.
Medium Open Forests and Medium Woodlands		
15a	Medium open forest with *Melaleuca quinquenervia.*	Very wet and wet lowlands on poorly drained alluvia.
15b	Medium woodland with *Eucalyptus acmenoides, Corymbia intermedia, Eucalyptus crebra, Eucalyptus platyphylla, Eucalyptus tereticornis, Corymbia tessellaris, Lophostemon suaveolens, Syncarpia glomulifera.*	Wet and moist foothills on granites.
Medium and Low Woodlands		
16a	Low layered grassy woodland with *Eucalyptus tereticornis, Corymbia tessellaris, Corymbia intermedia, Eucalyptus crebra, Eucalyptus platyphylla, Lophostemon suaveolens, Acacia aulacocarpa, Cycas media.*	Wet and moist foothills on metamorphics.
16b	Low woodland with *Corymbia intermedia, Eucalyptus pellita, Eucalyptus tereticornis, Corymbia tessellaris, Corymbia torelliana, Acacia aulacocarpa, Acacia mangium, Lophostemon suaveolens, Syncarpia glomulifera.*	Wet and moist lowlands and foothills on metamorphics.
16c	Low woodland with *Eucalyptus cloeziana, Eucalyptus acmenoides, Eucalyptus resinifera, Corymbia citriodora, Corymbia intermedia, Syncarpia glomulifera, Lophostemon suaveolens.*	Moist uplands on siliceous parent materials.
16d	Low to medium woodland with *Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus crebra, Eucalyptus platyphylla, Corymbia tessellaris, Eucalyptus tereticornis, Syncarpia glomulifera, Lophostemon suaveolens, Lophostemon confertus, Xanthorrhoea johnsonii, Cycas media.*	Dry sites within the moist foothills on granitic and metamorphic slopes.

16e	Low to medium woodland with *Corymbia intermedia, Eucalyptus tereticornis, Eucalyptus crebra, Allocasuarina torulosa, Allocasuarina littoralis, Lophostemon suaveolens, Acacia cincinnata, Acacia flavescens, Banksia integrifolia* subsp. *compar, Xanthorrhoea johnsonii.*	Moist and dry foothills and uplands on metamorphics and granites.
16f	Low to medium woodland with *Syncarpia glomulifera, Corymbia intermedia, Allocasuarina littoralis, Banksia integrifolia* subsp. *compar, Acacia flavescens, Xanthorrhoea johnsonii*.	Moist uplands on granite.
16g	Low to medium woodland with *Eucalyptus tereticornis, Corymbia tessellaris, Eucalyptus pellita, Corymbia intermedia, Melaleuca dealbata, Lophostemon suaveolens, Acacia mangium, Acacia crassicarpa.*	Wet and very wet lowlands and foothills on colluvia and alluvia.
16h	Low to medium woodland with *Eucalyptus leptophleba, Corymbia clarksoniana, Eucalyptus platyphylla, Corymbia dallachiana, Eucalyptus tessellaris, Eucalyptus tereticornis, Erythrophleum chlorostachys, Lophostemon grandiflorus, Melaleuca viridiflora, Melaleuca minutifolia, Allocasuarina littoralis, Allocasuarina luehmannii, Livistona muelleri*.	Dry uplands on colluvia and alluvia and alluvia derived from metamorphics and basalts.
16i	Low to medium woodland with *Corymbia citriodora, Eucalyptus acmenoides, Corymbia intermedia, Syncarpia glomulifera, Callitris columellaris, Acacia calyculata, Xanthorrhoea johnsonii.*	Moist and dry uplands and highlands on granite.
16j	Low woodland with *Eucalyptus cullenii, Corymbia nesophila, Eucalyptus crebra*, *Eucalyptus platyphylla, Melaleuca nervosa.*	Dry ridgetops on granites and metamorphics.
16k	Low to medium woodland with *Corymbia nesophila, Eucalyptus tetrodonta, Eucalyptus tereticornis, Corymbia tessellaris, Eucalyptus acmenoides, Eucalyptus brassiana, Erythrophleum chlorostachys, Xanthorrhoea johnsonii.*	Dry lowland and foothills on metamorphics and granites.
16l	Low woodland with *Eucalyptus tetrodonta, Eucalyptus brassiana, Melaleuca acacioides, Petalostigma pubescens, Xanthorrhoea johnsonii.*	Dry lowlands and foothills on alluvia and colluvia (laterite).
16m	Low to medium woodland with *Eucalyptus acmenoides, Eucalyptus crebra, Corymbia intermedia, Corymbia citriodora, Lophostemon suaveolens, Melaleuca viridiflora, Acacia flavescens, Allocasuarina littoralis.*	Dry uplands and highlands on granites.
16n	Low to medium woodland with *Eucalyptus phaeotricha, Corymbia intermedia, Eucalyptus crebra, Eucalyptus tereticornis, Syncarpia glomulifera, Eucalyptus pellita, Allocasuarina torulosa*.	Moist uplands and highlands on granites, acid volcanics, metamorphics and basalts.

16o	Low to medium woodland with *Eucalyptus tereticornis, Eucalyptus crebra, Eucalyptus acmenoides, Corymbia intermedia, Corymbia tessellaris, Allocasuarina torulosa, Angophora floribunda.*	Dry uplands and highlands on basalts.
16p	Low to medium woodland with *Eucalyptus platyphylla, Eucalyptus crebra, Lophostemon suaveolens.*	Moist lowlands and foothills on granites.

C. Vegetation Complexes and Mosaics

Note: Rainforest are often a minor component of many of these vegetation complexes & mosaics indicated in bold in the descriptions which follow.

17 Coastal Beach Ridges and Swales.
Main component: medium layered woodland (16g).
Minor components: **2b, 13a**, 15a, 19 and the main component of type 20; tall open *Melaleuca leucadendra, Melaleuca dealbata* forest; strand layered *Casuarina equisetifolia, Scaevola frutescens* woodland and low vine thicket.

18 Swampy Coastal Plains.
Main component: medium open *Melaleuca quinquenervia* forest (15a).
Minor components: **3a, 3b, 12c**, 16g, 23a and the main component of type 20; tall open *Melaleuca leucadendra, Melaleuca dealbata* forest and layered woodland (*Nauclea orientalis, Dillenia alata, Pandanus sp*.)

19 Coastal Floodplains and Piedmont Slopes.
Main component: tall open forest and tall woodland.
Minor components: **1a**, 15a, 16p, the main component of type 20 and tall open *Melaleuca dealbata* forest.

20 Texture-Contrast Soils with Impeded Drainage on Coastal Plains.
Main component stunted paper bark forest (*Melaleuca viridiflora*).
minor components **13a**, 16g, 16p, 15a, **3b** and low open forest (*Allocasuarina littoralis, Acacia flavescens*).

21 Mountain Rock Pavements.
Main component: scrub (Allocasuarina littoralis, Syncarpia glomulifera, Lophostemon confertus), shrubland (Banksia integrifolia, Leptospermum sp.) and heath (Xanthorrhoea johnsonii, Gahnia spp., Dicranopteris linearis).
Minor components: **13f** and 16f.

Saline Littoral Zone

22a Main component: **medium closed mangrove forest** *(Rhizophora spp. Bruguiera spp*.) and scrub (*Avicennia eucalyptifolia, Ceriops spp*.).
Minor components: **13d**, 16g, 17, 22b, and *Melaleuca leucadendra* tall open forest.

22b Main component: **Samphire flats** or salt meadows (*Sporobolus virginicus, Halosarcia indica subsp. leiostachya, Suaeda australis*).

Coastal Plains and Foothills

23a Freshwater swamps (seasonal and permanent) of coastal plains.
Main component: grassland (*Ischaemum villosum*) and sedgeland (*Cyperus exaltatus*).
Minor components: 18.

23b Fire-degraded grassland with woody regrowth on spurs of coastal foothills.
Main component: *Grassland (Imperata cylindrica, Themeda australis, Melinis minutiflora*).
Minor components: *Albizia procera, Timonius timon, Psidium guajava, Tithonia diversifolia.*

Key to terms used in the vegetation descriptions in Table 1 (above)

Altitudinal Zones	
Zone	Altitude
Lowlands	below 40 m
Foothills	40 - 400 m
Uplands	400 - 800 m
Highlands	above 800 m

Climatic Zones		
Type	Mean Annual Rainfall	Rainfall Driest 6 Months
Very Wet	>3000 mm	>750 mm
Wet	2000 - 3000 mm	500 - 750 mm
Cloudy Wet	2000 - 3000 mm + cloud	500 - 750 mm
Moist	1600 - 2000 mm	300 - 500 mm
Cloudy Moist	1600 - 2000 mm + cloud	300 - 500 mm
Dry	1300 - 1600 mm	200 - 300 mm

Tall:	trees in the tallest stratum greater than 30 metres
Medium:	trees in the tallest stratum 10 to 30 metres
Low:	trees in the tallest stratum 5 to 10 metres
Open Forest:	Projective foliage cover greater than 30 percent
Open Woodland:	Projective foliage cover sparse (10 to 30 percent)

Closed forests (rainforests): classified firstly into structural types, then into broad communities correlated with climatic zones, altitudinal zones and soil parent material.

Closed forests (rainforests) with sclerophyll emergents and codominants: classified into broad communities correlated with climatic zones, altitudinal zones and soil parent material.

Open sclerophyll forests and woodlands: classified into structural types, then into floristic communities corresponding with alliances correlated with climatic zones, altitudinal zones and soil parent material.

Vegetation complexes and mosaics: other vegetation types and mixtures with different components too small to be mapped separately at 1:100,000 scale.

APPROVAL
Board Meeting Number 31
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