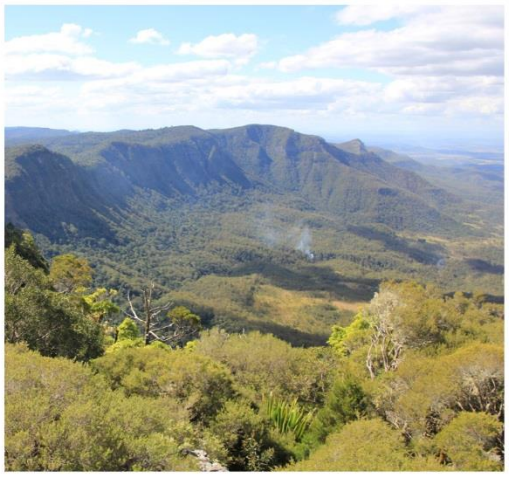
The Vegetation of Queensland

Descriptions of Broad Vegetation Groups

Version 4.0



Queensland Government

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Front cover images

Clockwise from top left:

Melaleuca fluviatilis with *Eucalyptus camaldulensis* fringing woodland, RE 9.3.13, Emu Creek near Petford, Einasleigh Uplands bioregion (MR Newton)

Agathis microstachya in complex notophyll vine forest, RE 7.8.2a. Lake Barrine, Wet Tropics bioregion (VJ Neldner)

Newcastelia spp. and *Scaevola* spp. shrubs on sand dunes near Ethabuka, RE 5.6.5a, Channel Country bioregion (VJ Neldner)

Looking west from Bare Rock Lookout to the Main Range escarpment Main Range National Park in Southeast Queensland bioregion (VJ Neldner)

Samphire flats RE 7.1.2a surrounded by *Rhizophora* spp. closed forest mangroves, RE 7.1.1 near Cairns airport, Wet Tropics bioregion (VJ Neldner)

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Abstract

The State of Queensland in northeast Australia covers 1.73 million square kilometres and encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid to arid climatic zones. Currently (January 2019), 1424 regional ecosystems are recognised across Queensland. Regional ecosystems are defined and mapped at 1:100,000 scale across the state. Many regional ecosystems include one or more vegetation communities, some of which are only recognised and mapped at scales larger than 1:100,000. A vegetation community is an association within a regional ecosystem that has similar structure and floristics and occurs within the same land zone.

Broad Vegetation Groups (BVGs) are a higher-level grouping of vegetation communities and regional ecosystems. BVGs provide an overview of vegetation across the state or a bioregion. They are a useful addition to the regional ecosystem framework by providing an overview of major ecological patterns and relationships across Queensland, independent of bioregions and land zones, and facilitate comparisons with vegetation in other states and internationally. The primary aim of this document is to concisely describe the BVGs of Queensland to enhance their use in government planning, policy and regulation, e.g. vegetation offsets, Bushfire Hazard Area mapping, public education and scientific investigations.

Floristic, structural, functional, biogeographic and landscape attributes have all been used in the BVG classification. The first aggregation of BVGs in the hierarchical classification is determined on the basis of vegetation structure (cover, height and growth form) of the ecologically dominant layer. BVGs are ordered broadly to reflect the vegetation structure along a mesic gradient from wet closed forests (rainforests) of the coast and north east, to the arid spinifex hummock grasslands of the south west. Specialised habitats such as freshwater wetlands (BVG 34) and intertidal areas (BVG 35) form the final groups. The rainforest aggregation (BVGs 1-7) are characterised by a generally closed tree canopy, predominantly non-sclerophyllous plants and frequently specialised lifeforms. The large aggregation of BVGs dominated by eucalypts (BVGs 8-19) is further subdivided on the basis of structure, mesic situation, landscape situation, predominant geology and dominant/ diagnostic species. The third aggregation of BVGs is dominated by trees or tall shrubs that are not eucalypts or rainforest species. Some BVGs in this aggregation are generally dominated by a single species, e.g. *Melaleuca viridiflora* (BVG 21a), or a group of taxonomically and functionally related species, e.g. *Acacia cambagei/ A. georginae/ A. argyrodendron* (BVG 26a), or by a combination of a structural formation, habitat and functionally related species such as low open woodlands on sand plains (BVG 27b).

The final aggregation of BVGs is those not dominated by trees or tall shrubs. Some BVGs in this aggregation encompass vegetation types that are generally dominated by a suite of taxonomically and functionally related species, such as *Acacia* spp. on residuals (BVG 24a) or *Senna* spp. (e.g. BVG 24b). Other groups are dominated by a distinct structural formation (such as tussock and closed tussock grasslands BVGs 30-32).

The Vegetation of Queensland describes the 98 BVGs defined for the 1:1M mapping level and lists the most extensive regional ecosystems in each BVG. The document is illustrated with 375 photographs, 108 tables and 103 maps, with detailed pre-clearing and remnant extent, and extent within the protected area estate. There are three nested levels of BVG which reflect the approximate scale at which they are designed to be used: the 1:1,000,000 (regional) (98 BVGs), 1:2,000,000 (state) (35 BVGs) and 1:5,000,000 (national) (16 BVGs). Links are provided to more detailed information and online regional ecosystem mapping.

Keywords: Broad Vegetation Groups; BVGs; vegetation classification; regional ecosystems; Queensland vegetation; vegetation offsets

Introduction

Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid to arid climatic zones. Currently (January 2019), 1424 regional ecosystems are recognised across Queensland. Regional ecosystems are defined and mapped at 1:100,000 scale across the state, with larger scale mapping in some parts of the coastal bioregions. These regional ecosystems are described in the Regional Ecosystem Description Database (REDD) (Queensland Herbarium 2018) and listed in the Queensland *Vegetation Management Regulation 2012*. Many regional ecosystems include one or more vegetation communities, some of which are only recognised and mapped at scales larger than 1:100,000. A vegetation community is an association or sub-association within a regional ecosystem that has similar structure and floristics and occurs within the same land zone. These vegetation communities are also described in REDD.

The history of classifying, survey and mapping the vegetation of Queensland is documented in Neldner (1993), and the more recent regional ecosystem survey and mapping in Neldner *et al.* (2017a). The methods for classification, mapping and site sampling are described in Neldner *et al.* (2017b). All of Queensland has been mapped as pre-clearing and remnant 2017 (remnant in 2017) regional ecosystems at least at 1:100,000 scale (Queensland Herbarium 2018), see Figure 1.

In the Wet Tropics bioregion and much of the Southeast Queensland and New England Tableland bioregions, the regional ecosystem mapping is at 1:50,000 scale. The Brisbane City Council areas has been mapped at 1:25,000 scale and incorporated into the State-wide RE coverage. The advanced state of knowledge of the spatial distribution of Queensland's regional ecosystems allows for this publication to be produced. In addition, the Queensland Herbarium Regional Ecosystem Survey and Mapping program has made a significant contribution to Herbarium collections and botanical knowledge (Neldner 2014).

Broad vegetation groups (BVGs) are a higher-level grouping of vegetation communities and regional ecosystems. BVGs provide an overview of vegetation across the state or a bioregion. They are a useful addition to the regional ecosystem framework by providing an overview of major ecological patterns and relationships across Queensland, independent of bioregions and land zones, and facilitate comparisons with vegetation in other states and internationally. The primary aim of this document is to concisely describe the BVGs of Queensland to enhance their use in government planning, policy and regulation, e.g. vegetation offsets, Bushfire Hazard Area mapping, public education and scientific investigations.

Defining Broad Vegetation Groups

The Queensland Herbarium has been using the term Broad Vegetation Groups since 1984 (Boyland 1984, Neldner 1984) to amalgamate vegetation communities and regional ecosystems on a pragmatic basis to form BVGs that communicate higher-level ecological groupings. Floristic, structural, functional, biogeographic and landscape (land zone, landform, and soil type) attributes have all been used in this classification. Appendix 1 provides four tables which show the key diagnostic characteristics of each broad vegetation group. These tables can be used as a deductive key to determine the correct BVG for any regional ecosystem or vegetation community in Queensland.

The first aggregation of BVGs in the hierarchical classification is determined on the basis of vegetation structure (cover, height and growth form) of the ecologically dominant layer. BVGs are ordered broadly to reflect the vegetation structure along a mesic gradient from wet closed forests (rainforests) of the coast and north east, to the arid spinifex hummock grasslands of the south west. Specialised habitats such as freshwater wetlands (BVG 34) see Appendix 2, and

intertidal areas (BVG 35) form other groups, and use water salinity and landscape situation to further classify the groups. The rainforest aggregation (BVGs 1-7) are characterised by a generally closed tree canopy, predominantly non-sclerophyllous plants and frequently specialised lifeforms. The rainforests are further divided into broad groups based on the predominantly structural classification of Webb (1978), see Appendix 1 Table A.

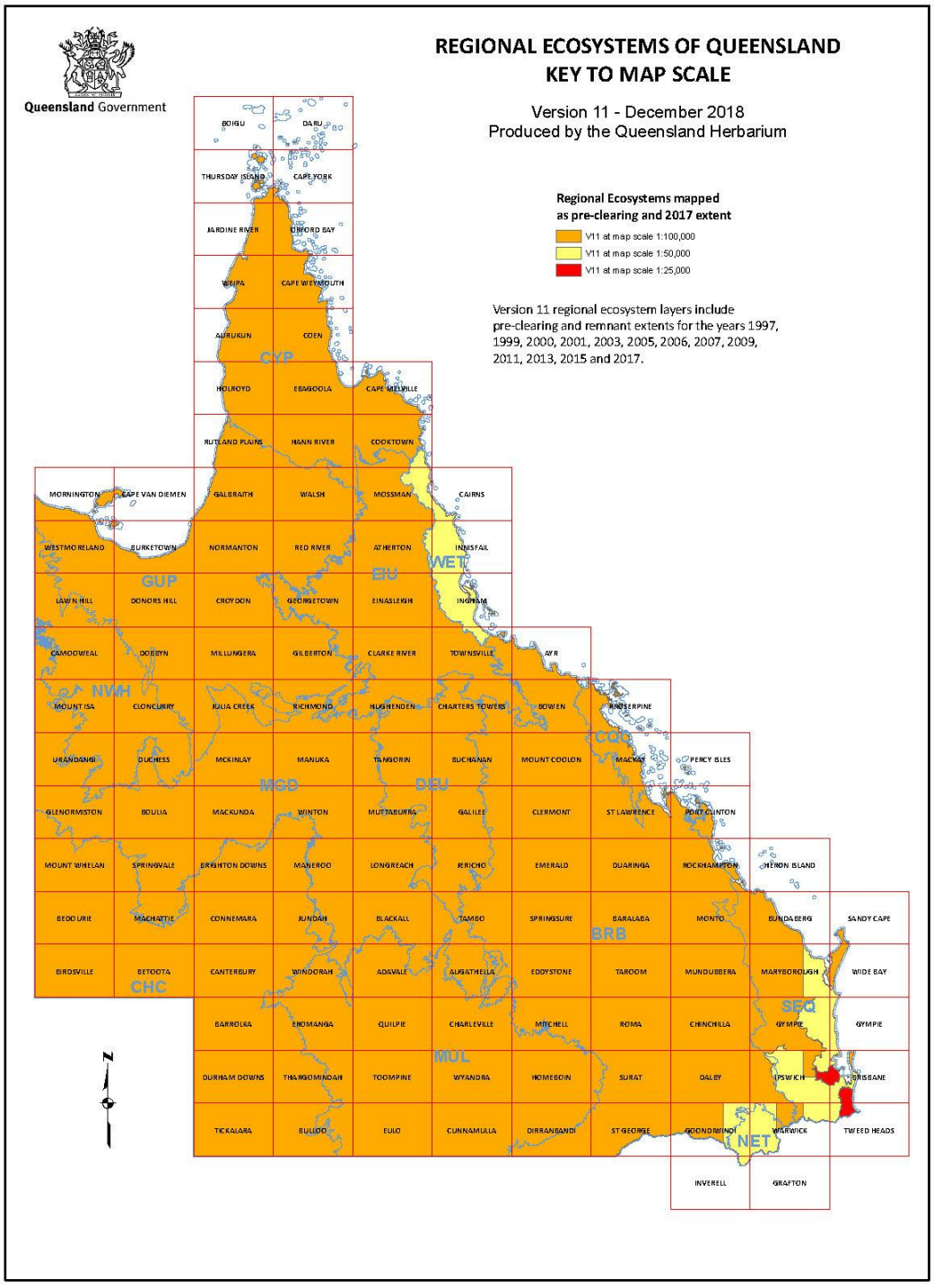


Figure 1 Extent and scale of regional ecosystem mapping in Queensland in 2018

The large aggregation of BVGs dominated by eucalypts (BVGs 8-19) are further subdivided in a hierarchical classification on the basis of structure, mesic situation, landscape situation, predominant geology and dominant/ diagnostic species, see Appendix 1 Table B.

The third aggregation of BVGs, see Appendix 1 Table C, is dominated by trees or tall shrubs that are not eucalypts or rainforest species. Some BVGs in this aggregation are generally dominated by a single species, e.g. *Melaleuca viridiflora* (BVG 21a), *Acacia aneura* (BVG 23a,b), *Acacia harpophylla* (BVG 25a), or a group of taxonomically and functionally related species, e.g. *Acacia cambagei/ A. georginae/ A. argyrodendron* (BVG 26a), or by a combination of a structural formation, habitat and functionally related species (such as low open woodlands dominated by *Lysiphyllum* spp*./ Atalaya hemiglauca/ Grevillea striata*, primarily on sand plains (BVG 27b).

The final aggregation of BVGs are those not dominated by trees or tall shrubs, see Appendix 1 Table D. Some BVGs in this aggregation encompass vegetation types that are generally dominated by a suite of taxonomically and functionally related species, such as *Acacia* spp. on residuals (BVG 24a) or *Senna* spp. (e.g. BVG 24b). Other groups are dominated by a distinct structural formation (such as tussock and closed tussock grasslands BVGs 30-32).

There are three nested levels of broad vegetation groups which reflect the approximate scale at which they are designed to be used: the 1:1,000,000 (regional), 1:2,000,000 (state) and 1:5,000,000 (national). The regional ecosystem spatial dataset includes the dominant broad vegetation groups as DBVG1M, DBVG2M, and DBVG5M for each polygon. The BVG hierarchy is nested hence the 98 BVGs at the 1:1M mapping level are combined into 35 groups at the 1:2M level, and into 16 groups at the 1:5M level. This document describes the 98 BVGs defined for the 1:1M mapping level and lists the most extensive (by pre clearing area) regional ecosystems included in each BVG. Previous BVGs from regional survey and mapping projects (Boyland 1984, Neldner 1984, 1991, Neldner and Clarkson 1994, Fox et al. 2001) have been modified and incorporated into this state-wide BVG classification.

Similar high-level broad groupings are used at the national level, in the native vegetation assessment carried out by the National Land and Water Resources Audit (NLWRA 2001), where vegetation communities were summarised into major vegetation groups (MVGs) (DEWR 2007). MVG classifications contain different mixes of plant species within the canopy, shrub or ground layers, but are structurally similar and often dominated by the same genus. The relationship of the National MVGs to the Queensland BVGs is given in Appendix 4. Some Queensland BVGs are split into two MVGs on the basis of structure, which can vary at a site depending on environmental conditions and management at the site. In addition for carbon accounting, the vegetation is often classified into the very broad structural categories of closed forest, open forest, woodland and non-woody vegetation.

Broad Vegetation Groups extent

Broad vegetation groups vary greatly in their extent. The largest BVG 30b *Astrebla* spp. or *Dichanthium* spp. tussock grasslands on undulating downs had a pre-clearing distribution covering 10% of Queensland, while the diverse collection of wetlands in BVG 34e Springs with water dependent herbs throughout Queensland only covers 0.003% of the state. Table 1 lists the eight largest and four smallest BVG by pre-clearing area.

Some BVGs are restricted to one or only a few bioregions e.g. BVG 33a Hummock grasslands dominated by *Triodia basedowii* (hard spinifex) or *Zygochloa paradoxa* (sandhill canegrass) associations on dunefields or sandplains is restricted to the Channel Country bioregion, and the rainforest BVGs largely to the coastal bioregions. In many cases, a single or combination of a few BVGs dominate and define the character of the landscapes of a particular bioregion

e.g. BVG 30b *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. tussock grasslands on undulating downs or clay plains covers 40% of the Mitchell Grass Downs bioregion, and the extensive Brigalow Belt Bioregion is dominated by BVG 25a *Acacia harpophylla* (brigalow) open-forests (24% of area) and BVG 17a *Eucalyptus populnea* woodlands (15%). Whereas vegetation of riparian areas such as BVG 16a Open forest and woodlands dominated by *Eucalyptus camaldulensis* (river red gum) (or *E. tereticornis*) and/or *E. coolabah* (*or E. microtheca*) fringing drainage lines occurs in all bioregions apart from Cape York Peninsula and Central Queensland Coast.

Table 1 Eight largest and four least extensive (by pre-clearing area) broad vegetation groups for Queensland

BVG 1:1M	Pre-clear area (ha)	% QLD	% remnant in 2017	Description
	Most extensive			
30b	17,912,697	10.4	95.7%	Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Iseilema* spp. on undulating downs or clay plains.
25a	10,174,841	5.9	12.2%	*Acacia harpophylla* (brigalow) open-forests to woodlands sometimes with *Casuarina cristata* (belah). Includes areas co-dominated with *A. cambagei* (gidgee).
26a	9,000,268	5.2	77.0%	*Acacia cambagei* (gidgee) or *A. georginae* (Georgina gidgee) or *A. argyrodendron* (blackwood) open-forests to tall shrublands.
17a	8,080,969	4.7	36.6%	*Eucalyptus populnea* (poplar box) (or *E. brownii* (Reid River box)) woodlands on alluvium, sand plains and footslopes.
23a	7,611,960	4.4	71.2%	*Acacia aneura* (mulga) on red earth plains or sandplains.
24a	7,073,162	4.1	93.2%	*Acacia* spp. low woodlands to tall shrublands on residuals.
16c	6,761,992	3.9	65.8%	*Eucalyptus coolabah* (coolibah) or *E. microtheca* or *E. largiflorens* (black box) or *E. tereticornis* (blue gum) woodlands.
13c	6,742,949	3.9	69.8%	*Eucalyptus crebra* (narrow-leaved red ironbark), *E. drepanophylla* (grey ironbark), *E. fibrosa* (dusky-leaved ironbark), *E. shirleyi* (Shirley's silver-leaved ironbark) woodlands.
	Least extensive			
6a	23,691	0.014	84.2%	Notophyll vine forest and microphyll fern forest to thicket on high peaks and plateaus of southern Queensland.
2b	22,944	0.013	99.8%	Semi-deciduous mesophyll to notophyll vine forest usually on granitic ranges.
34f *	6,603	0.004	59.7%	Palustrine wetlands. Sedgelands/grasslands on seeps and soaks on wet peaks, coastal dunes and non-floodplain features.
34e *	5,528	0.003	99.7%	Palustrine wetlands. Springs with water dependent herbs.

* Restricted habitats of high conservation significance. The extent figures are inflated by the inclusion of small areas of surrounding habitats.

Different BVGs have been subjected to more clearing than others based primarily on their agricultural potential and also human population density.

Figure 2(a) and (b) show maps of the Queensland BVGs for both their pre-clearing and remnant (as defined under the *Vegetation Management Act* 1999) distribution.

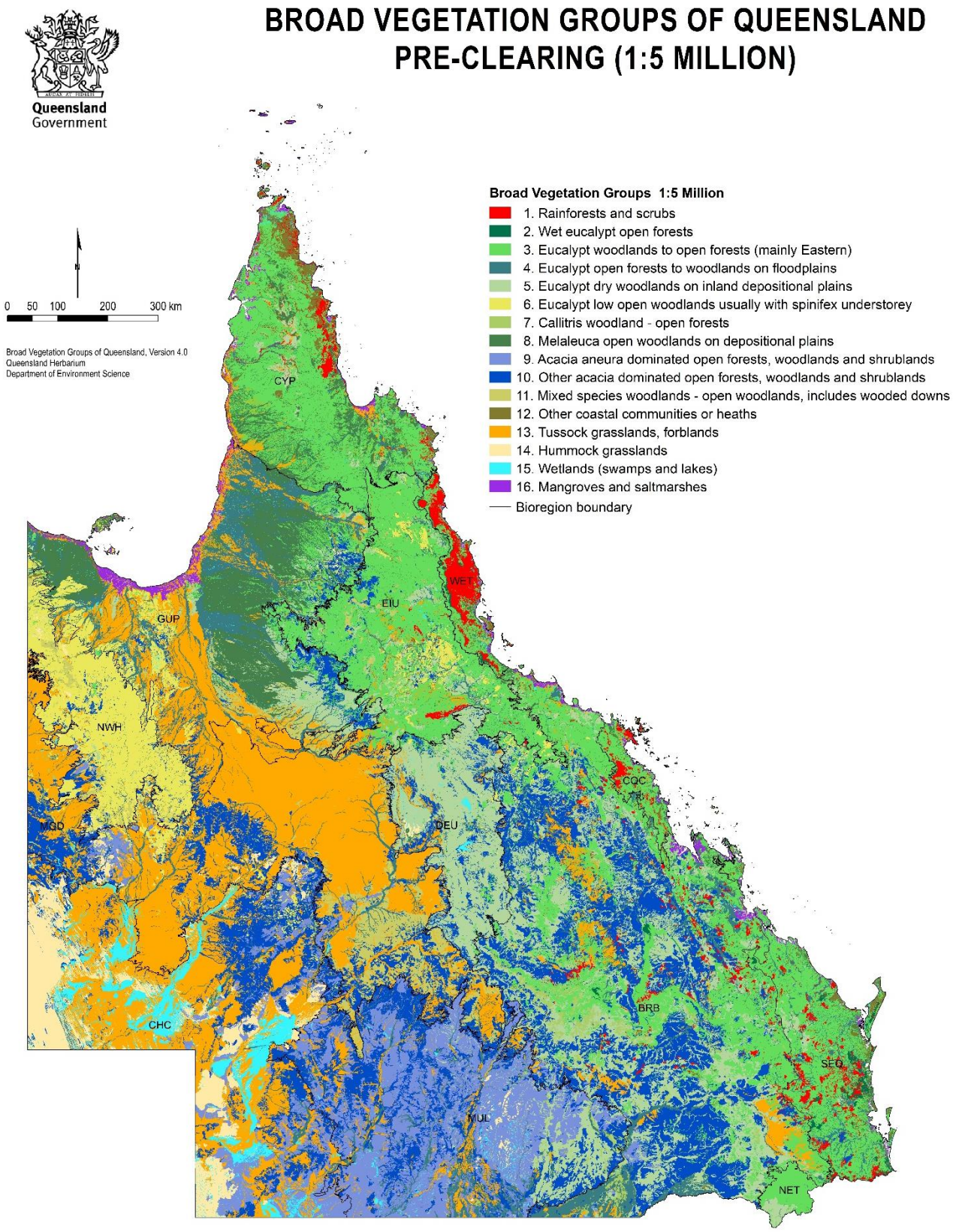


Figure 2(a) Pre-clearing extent of 16 BVGs at the 1:5 million scale

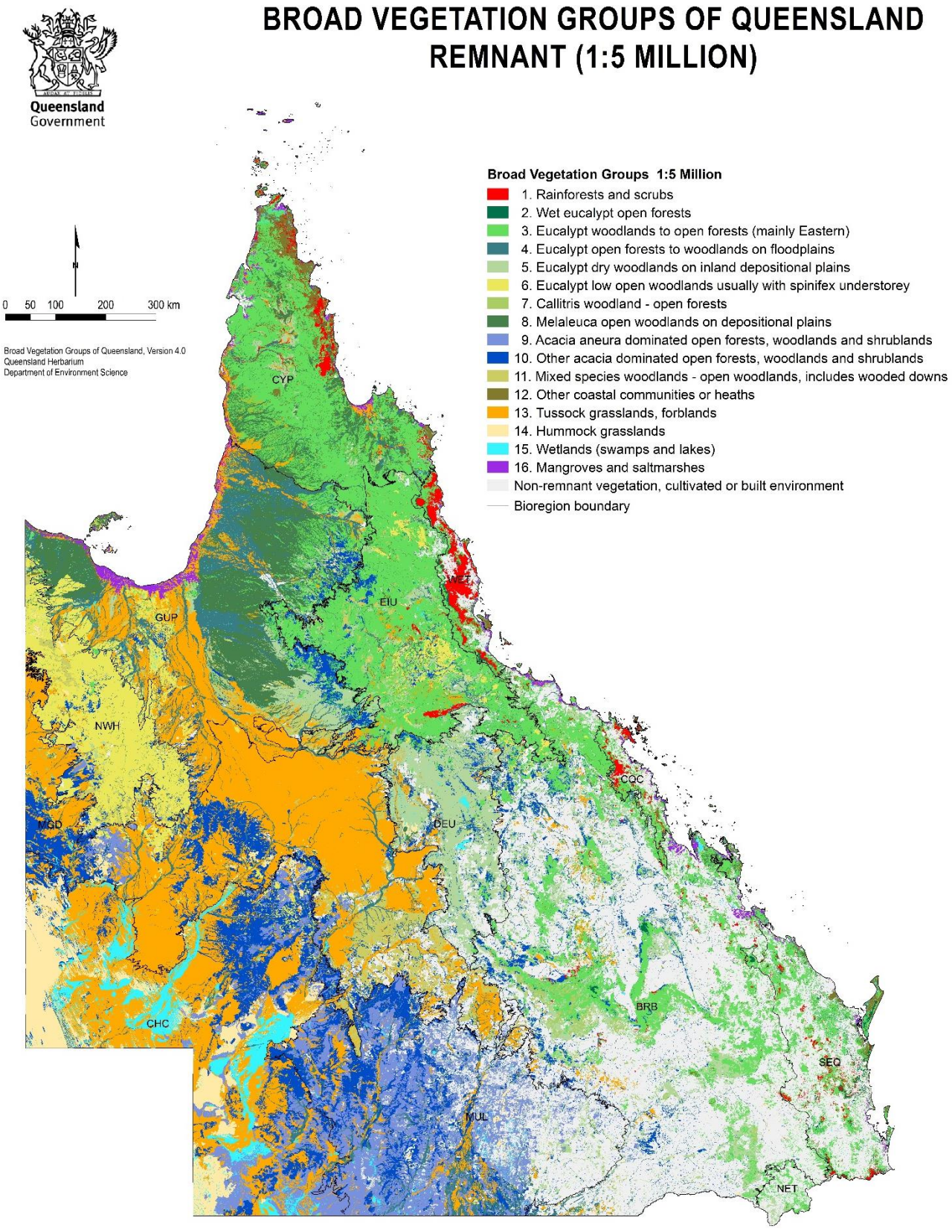


Figure 2(b) Remnant 2017 extent of 16 BVGs at the 1:5 million scale

The BVGs that have lost more than 20% of their pre-clearing distribution are listed in Table 2. Statistics on the pre-clearing and remnant extent of regional ecosystems and BVGs are provided in Accad *et al.* (2019). The Queensland Herbarium maps remnant vegetation as described in the glossary (Appendix 3) and remnant maps are defined under the *Vegetation Management Act 1999*. However it is recognised that there are a number of condition states within remnant vegetation. BioCondition (Eyre *et al*. 2017) is a site based assessment tool for quantifying the condition of vegetation based on both site and landscape attributes.

Table 2 Broad vegetation groups that have less than 80% of their pre-clearing extent remaining in 2017

BVG 1:1M	Pre-clear area (ha)	% Pre-clear that remains in 2017	Description
25a	10,174,841	12.2%	Open forests to woodlands dominated by *Acacia harpophylla* (brigalow) sometimes with *Casuarina cristata* (belah) on heavy clay soils. Includes areas co-dominated with *A. cambagei* (gidgee) and/or emergent eucalypts.
15b	46,722	15.0%	Woodlands dominated by *Eucalyptus conica* (fuzzy box) or *E. nova-anglica* (New England peppermint) or *E. blakelyi* (Blakely's red gum) on alluvial plains.
5a	203,098	25.4%	Araucarian notophyll/microphyll and microphyll vine forests of southern coastal bioregions.
1a	110,239	26.2%	Complex mesophyll to notophyll vine forests usually in fertile and very wet locations.
2d	30,850	32.4%	Semi-deciduous notophyll/mesophyll vine forest on coastal ranges.
17a	8,080,969	36.6%	Woodlands dominated by *Eucalyptus populnea* (poplar box) (or *E. brownii* (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges.
9g	844,210	38.6%	Moist to dry woodlands to open forest dominated by stringybarks or mahoganies such as *Eucalyptus tindaliae* (Queensland white stringybark), *E. latisinensis* (white mahogany), *E. acmenoides* (narrow-leaved white stringybark); or *E. racemosa* (scribbly gum) or *E. seeana* or *E. tereticornis* (blue gum) and *Corymbia intermedia* (pink bloodwood).
1b	81,534	39.1%	Complex mesophyll to notophyll vine forests usually on basalt tablelands.
7a	955,416	39.4%	Semi-evergreen vine thickets on wide range of substrates.
15a	345,984	43.4%	Woodlands and open forests dominated by *Eucalyptus youmanii* (Youman's stringybark), *E. scoparia* (Wallangarra white gum), *E. caliginosa* (broad-leaved stringybark) or *E. melliodora* (yellow box) occurring on traprock.
22a	174,753	46.8%	Open forests and woodlands dominated by *Melaleuca quinquenervia* (swamp paperbark) in seasonally inundated lowland coastal areas and swamps.
13d	749,151	47.1%	Woodlands dominated by *Eucalyptus moluccana* (gum-topped box) (or *E. microcarpa* (inland grey box)) on a range of substrates.
11a	1,427,703	55.7%	Moist to dry open forests to woodlands dominated by *Eucalyptus orgadophila* (mountain coolibah). Some areas dominated by *E. tereticornis* (blue gum), *E. melliodora* (yellow box), *E. albens* (white box), *E. crebra* (narrow-leaved red ironbark) or *E. melanophloia* (silver-leaved ironbark).
34f	6,603	59.7%	Palustrine wetlands. Sedgelands/grasslands on seeps and soaks on wet peaks, coastal dunes and other non-floodplain features.
17b	4,219,407	60.2%	Woodlands to open woodlands dominated by *Eucalyptus melanophloia* (silver-leaved ironbark) (or *E. shirleyi* (Shirley's silver-leaved ironbark)) on sand plains and footslopes of hills and ranges.
8b	154,773	60.8%	Moist open forests to tall open forests mostly dominated by *Eucalyptus pilularis* (blackbutt) on coastal sands, sub-coastal sandstones and basalt ranges. Also includes tall open forests dominated by *E. montivaga, E. obliqua* (messmate stringybark) and *E. campanulata* (New England ash).

BVG 1:1M	Pre-clear area (ha)	% Pre-clear that remains in 2017	Description
9e	1,506094	62.5%	Open forests, woodlands and open woodlands dominated by *Corymbia clarksoniana* (grey bloodwood) (or *C. novoguinensis* or *C. intermedia* (pink bloodwood) or *C. polycarpa* (long-fruited bloodwood)) frequently with *Erythrophleum chlorostachys* (red ironwood) or *Eucalyptus platyphylla* (poplar gum) predominantly on coastal sandplains and alluvia.
10b	1,544,140	63.7%	Moist open forests to woodlands dominated by *Corymbia citriodora* (spotted gum).
9a	279,940	64.2%	Moist eucalypt open forests to woodlands dominated by a variety of species including *Eucalyptus siderophloia* (red ironbark), *E. propinqua* (small-fruited grey gum), *E. acmenoides* (narrow-leaved white stringybark), *E. microcorys* (tallowwood), *E. carnea* (broad-leaved white mahogany), *E. tindaliae* (Queensland white stringybark), *Corymbia intermedia* (pink bloodwood), *Lophostemon confertus* (brush box).
4a	47,669	65.7%	Notophyll and mesophyll vine forest with feather or fan palms in alluvia and in swampy situations on ranges or within coastal sand masses.
16c	6,761,992	65.8%	Woodlands and open woodlands dominated by *Eucalyptus coolabah* (coolibah) or *E. microtheca* (coolibah) or *E. largiflorens* (black box) or *E. tereticornis* (blue gum) or *E. chlorophylla* on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded.
20a	1,261,729	69.0%	Woodlands to open forests dominated by *Callitris glaucophylla* (white cypress pine) or *C. intratropica* (coast cypress pine).
13c	6,742,949	69.8%	Woodlands of *Eucalyptus crebra* (narrow-leaved red ironbark), *E. drepanophylla* (grey ironbark), *E. fibrosa* (dusky-leaved ironbark), *E. shirleyi* (Shirley's silver-leaved ironbark) on granitic and metamorphic ranges.
9h	321,156	70.4%	Dry woodlands dominated by species such as *Eucalyptus acmenoides* (narrow-leaved white stringybark) (or *E. portuensis or E. helidonica*), *E. tereticornis* (blue gum), *Angophora leiocarpa* (rusty gum), *Corymbia trachyphloia* (yellow bloodwood) or *C. intermedia* (pink bloodwood), and often ironbarks including *E. crebra* (narrow-leaved red ironbark) or *E. fibrosa* (dusky-leaved ironbark). A heathy shrub layer is frequently present. On undulating to hilly terrain.
18b	2,191,342	71.1%	Woodlands dominated *Eucalyptus crebra* (narrow-leaved red ironbark) frequently with *Corymbia* spp. or *Callitris* spp. on flat to undulating plains.
23a	7,611,960	71.2%	Woodlands to low woodlands dominated by *Acacia aneura* on red earth plains or sandplains (soft mulga).
9f	43,568	71.5%	Woodlands dominated by *Corymbia* spp. e.g. *C. intermedia* (pink bloodwood), *C. tessellaris* (Moreton Bay ash) and/or *Eucalyptus* spp. such as *E. tereticornis* (blue gum), frequently with *Banksia* spp., *Acacia* spp. and *Callitris columellaris* (Bribie Island pine) on coastal dunes and beach ridges.
2a	511,652	73.5%	Complex evergreen notophyll vine forest frequently with *Araucaria cunninghamii* (hoop pine) from foothills to ranges.
4b	204,922	75.4%	Evergreen to semi-deciduous mesophyll to notophyll vine forest, frequently with *Archontophoenix* spp. (palms) fringing streams.
8a	248,472	77.0%	Wet tall open forest dominated by species such as *Eucalyptus grandis* (flooded gum) or *E. saligna*, *E. resinifera* (red mahogany), *Lophostemon confertus* (brush box), *Syncarpia glomulifera* (turpentine), *E. laevopinea* (silvertop stringybark). Contains a well-developed understorey of rainforest components, including ferns and palms, or the understorey may be dominated by sclerophyll shrubs.
26a	9,000,268	77.0%	Open forests to tall shrublands dominated by *Acacia cambagei* (gidgee) or *A. georginae* (Georgina gidgee) or *A. argyrodendron* (blackwood).

Bioregional distribution

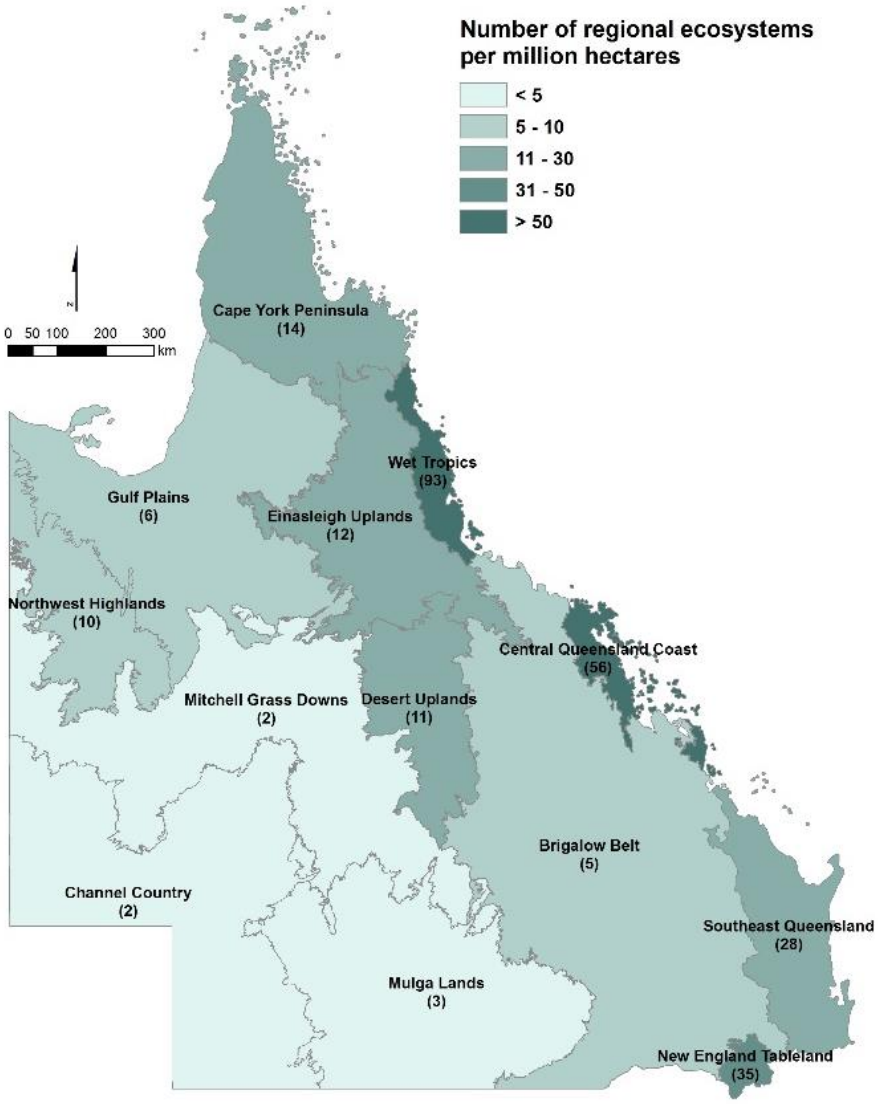
The relative numbers of units for Queensland bioregions for each of the classification levels (regional ecosystems, broad vegetation groups at 1:5 million, 1:2 million and 1:1 million) is shown in Table 3.

Table 3 Number of classification units for Queensland

Bioregion name	BGR (abbrev)	Number of regional ecosystems	BVG communities at 1:1 M	BVG communities at 1:2 M	BVG communities at 1:5 M
Northwest Highlands	NWH	72	23	16	12
Gulf Plains	GUP	139	51	25	14
Cape York Peninsula	CYP	176	45	21	11
Mitchell Grass Downs	MGD	59	22	12	9
Channel Country	CHC	54	17	9	7
Mulga Lands	MUL	65	18	12	8
Wet Tropics	WET	185	42	20	9
Central Queensland Coast	CQC	82	32	18	9
Einasleigh Uplands	EIU	144	42	22	12
Desert Uplands	DEU	76	37	20	13
Brigalow Belt	BRB	173	51	30	15
Southeast Queensland	SEQ	172	43	24	11
New England Tableland	NET	27	13	9	7
All Queensland		1424	98	35	16

Wet Tropics (bioregion 7) currently has the highest number of regional ecosystems at 185 which occur in 42 different BVGs at the 1:1M level. The smallest Queensland bioregion New England Tablelands (bioregion 13), has the lowest number of regional ecosystems (27) from only 13 BVGs at the 1:1M level. However, when the diversity of regional ecosystems is examined on an area basis as in Figure 3, it can be seen that the coastal bioregions of the Wet Tropics and Central Queensland Coast are the most diverse, with the more expansive inland bioregions having the lowest diversity per area basis. These statistics may change in the future as bioregions are being systematically reviewed for consistency in the level of classification.

Figure 3 Number of regional ecosystems per million hectares for Queensland bioregions



Extent in Protected Areas

In 2018, Queensland has 9,755,521 ha or 5.6% of the land area in protected areas which includes National Parks, National Parks (Cape York Peninsula Aboriginal Land) and Regional Parks, but not State Forests and Timber Reserves. While the protected area system endeavours to preserve areas of all vegetation types, the coverage varies. Table 4 lists the 1:1M BVGs where less than 5% of the BVG pre-clearing area is protected.

Table 4 Broad vegetation groups where less than 5% of the pre-clearing area occurs in protected areas in 2018

BVG 1:1M	Hectares in protected areas (PA)	% of pre-clear extent in PA	Description
27b	43	<0.1%	Low woodlands of a variety of species including *Lysiphyllum cunninghamii*, *Grevillea striata* (beefwood) *Atalaya hemiglauca* (whitewood) occurring on sandplains. (Bylong land system).
27a	5,657	0.1%	Low open woodlands dominated by a variety of species including *Acacia tephrina* (boree), *Atalaya hemiglauca* (whitewood), *Archidendropsis basaltica* (eastern dead finish), *Ventilago viminalis* (supplejack) and *Lysiphyllum* spp.
30a	18,005	0.4%	Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Eulalia aurea* (silky browntop) on alluvia.
17a	59,192	0.7%	Woodlands dominated by *Eucalyptus populnea* (poplar box) (or *E. brownii* (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges.
25a	82,593	0.8%	Open forests to woodlands dominated by *Acacia harpophylla* (brigalow) sometimes with *Casuarina cristata* (belah) on heavy clay soils. Includes areas co-dominated with *A. cambagei* (gidgee) and/or emergent eucalypts.
18a	16,167	1.1%	Dry woodlands to open woodlands, dominated by bloodwoods (*Corymbia dallachiana, C. terminalis* (western bloodwood*), C. plena, or C. leichhardtii* (rustyjacket)) or ironbarks (*Eucalyptus quadricostata* (Pentland ironbark), *E. crebra* (narrow-leaved red ironbark) or *E. exilipes* (fine-leaved ironbark)), often with *E. acmenoides* (narrow-leaved white stringybark), *Angophora leiocarpa* (rusty gum) and *Callitris glaucophylla* (white cypress pine) in the Brigalow Belt, on sandy plateaus and plains.
19c	14,400	1.1%	Low open woodlands dominated by *Eucalyptus pruinosa* on sandplains and outwash areas.
18b	27,023	1.2%	Woodlands dominated *Eucalyptus crebra* (narrow-leaved red ironbark) frequently with *Corymbia* spp. or *Callitris* spp. on flat to undulating plains.
17b	57,639	1.4%	Woodlands to open woodlands dominated by *Eucalyptus melanophloia* (silver-leaved ironbark) (or *E. shirleyi* (Shirley's silver-leaved ironbark)) on sand plains and footslopes of hills and ranges.
23b	80,660	1.6%	Tall shrublands to low open woodlands dominated by *Acacia aneura* on shallow red earth plains (hard mulga).
30b	302,910	1.7%	Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Iseilema* spp. on undulating downs or clay plains.
15b	875	1.9%	Woodlands dominated by *Eucalyptus conica* (fuzzy box) or *E. nova-anglica* (New England peppermint) or *E. blakelyi* (Blakely's red gum) on alluvial plains.
19b	57,913	2.0%	Low open woodlands dominated by *Eucalyptus leucophylla* (Cloncurry box) or less extensively *Corymbia terminalis* (western bloodwood) low open woodlands and related associations, mainly lower slopes and valleys.
34g	38,842	2.0%	Palustrine wetlands. Generally intermittent swamps/ claypans on floodplains in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs.
16a	85,054	2.1%	Open forest and woodlands dominated by *Eucalyptus camaldulensis* (river red gum) (or *E. tereticornis* (blue gum)) and/or *E. coolabah* (coolibah) (or *E. microtheca* (coolibah)) fringing drainage lines. Associated species may include *Melaleuca* spp., *Corymbia tessellaris* (carbeen), *Angophora* spp., *Casuarina cunninghamiana* (river she-oak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded.

BVG 1:1M	Hectares in protected areas (PA)	% of pre-clear extent in PA	Description
13c	145,763	2.2%	Woodlands of *Eucalyptus crebra* (narrow-leaved red ironbark), *E. drepanophylla* (grey ironbark), *E. fibrosa* (dusky-leaved ironbark), *E. shirleyi* (Shirley's silver-leaved ironbark) on granitic and metamorphic ranges.
17c	40,768	2.3%	*Eucalyptus whitei* (White's ironbark) or *E. similis* (Queensland yellowjacket) woodlands to open woodlands on sand sheets.
18d	15,651	2.6%	Woodlands to low open woodlands dominated by *Eucalyptus microneura* (Gilbert River box) sometimes with *Corymbia* spp.
34b	23,296	2.8%	Palustrine wetlands. Generally intermittent swamps/claypans (non floodplains) in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs.
20a	35,455	2.8%	Woodlands to open forests dominated by *Callitris glaucophylla* (white cypress pine) or *C. intratropica* (northern cypress pine).
13d	21,130	2.8%	Woodlands dominated by *Eucalyptus moluccana* (gum-topped box) (or *E. microcarpa* (inland grey box)) on a range of substrates.
31a	153,207	2.8%	Open forblands to open tussock grasslands which may be composed of *Atriplex* spp. (saltbush), *Sclerolaena* spp. (burr), Asteraceae spp. and/or short grasses on alluvial plains.
16c	196,650	2.9%	Woodlands and open woodlands dominated by *Eucalyptus coolabah* (coolibah) or *E. microtheca* (coolibah) or *E. largiflorens* (black box) or *E. tereticornis* (blue gum) or *E. chlorophylla* on floodplains.
31b	64,749	3.0%	Short grass / forb associations on stony downs.
33b	28,744	3.1%	Hummock grasslands dominated by *Triodia pungens* or *T. longiceps* (giant grey spinifex) or *T. mitchellii* (buck spinifex) sandplains.
23a	246,253	3.2%	Woodlands to low woodlands dominated by *Acacia aneura* on red earth plains or sandplains (soft mulga).
34d	12,567	3.5%	Palustrine wetlands. Freshwater swamps/springs/billabongs on floodplains ranging from permanent and semi-permanent to ephemeral.
16d	7,366	3.9%	River beds, open water or sand, or rock, frequently not vegetated.
13a	120,738	3.9%	Woodlands and open woodlands dominated by ironbarks such as *Eucalyptus cullenii* (Cullen's ironbark), *E. staigeriana* (lemon-scented ironbark) or *E. melanophloia* (silver-leaved ironbark) and bloodwoods such as *Corymbia stockeri* subsp. *peninsularis*, *C. clarksoniana* (grey bloodwood) or *C. leichhardtii* (rustyjacket).
15a	14,912	4.3%	Woodlands and open forests dominated by *Eucalyptus youmanii* (Youman's stringybark), *E. scoparia* (Wallangarra white gum), *E. caliginosa* (broad-leaved stringybark) or *E. melliodora* (yellow box) occurring on traprock.
24b	21,229	4.5%	Open shrublands dominated by *Senna* spp. on calcareous residuals
16b	68,020	4.5%	Woodlands dominated by *Eucalyptus leptophleba* (Molloy red box), with *Corymbia tessellaris* (carbeen) or *C. clarksoniana* (grey bloodwood) or *C. dallachiana*. On sandy levees.
19d	71,192	4.6%	Low open woodlands dominated by *Eucalyptus persistens* (or *E. normantonensis* (Normanton box), *E. tardecidens, E. provecta*) with *Triodia* spp. dominated ground layer, mainly on hills and ranges.

BVG 1:1M	Hectares in protected areas (PA)	% of pre-clear extent in PA	Description
32a	63,468	4.8%	Closed tussock grasslands dominated by *Themeda arguens*, *Dichanthium sericeum* (Queensland bluegrass) or *Panicum* spp., *Eriachne* spp., *Fimbristylis* spp., *Aristida* spp. or *Imperata cylindrica* (blady grass) on marine and alluvial plains.
13b	39,279	4.9%	Woodlands to open woodlands dominated by *Eucalyptus microneura* (Gilbert River box) on shallow soils on rolling hills.
18c	41,567	4.9%	Woodlands and open woodlands dominated by *Eucalyptus chlorophylla (E. microtheca* or *E. leptophleba* on heavy soils) frequently with *Corymbia* spp.; or dominated by *E. tectifica* west of Burketown
26a	446,417	5.0%	Open forests to tall shrublands dominated by *Acacia cambagei* (gidgee) or *A. georginae* (Georgina gidgee) or *A. argyrodendron* (blackwood).

Additional Regional Ecosystem information

Detailed information on individual regional ecosystems and vegetation communities is available from the Regional Ecosystem Description Database (REDD) (Queensland Herbarium 2018), https://data.qld.gov.au/dataset/regional-ecosystem-description-database.

For an introductory explanation of the regional ecosystem classification system, readers should refer to Sattler (1999). For more detailed and up to date information, the references of Neldner *et al*. (2017a,b), Wilson and Taylor (2012), regional ecosystem framework training (Queensland Herbarium 2013b), REDD and regional ecosystem technical descriptions e.g. Ryan (2014) should be consulted. The pre-clearing and Remnant 2017 extent of regional ecosystems and vegetation communities for bioregions, subregions, Natural Resource Management Group areas, local government areas, catchment areas and Queensland electorate districts is documented in Accad *et al.* (2019) and associated spread sheets.

There are fire management guidelines provided for some regional ecosystem in REDD (Queensland Herbarium 2018). The guidelines for regional ecosystems are presented from an ecological perspective, designed to enhance biodiversity. While it is likely most REs in a BVG will have similar fire guidelines, it is preferable to refer to individual REs for management decisions. However BVGs have been used to form general fire behaviour classes such as the Savanna Burning Classes under the Carbon Farming Initiative (Australian Government 2013).

Regional Ecosystem data sources

Pre-clearing and remnant regional ecosystem mapping data and the BVG derived layers are available for most of Queensland in shapefile format through the Queensland Government data web site (https://data.qld.gov.au/). Use the search term, “regional ecosystem”.

BVG Maps in Portable Document Format (PDF) are available online (https://environment.ehp.qld.gov.au/map-request/re-broad-veg-group/).

Alternatively regional ecosystem and BVG mapping can be viewed using the Biota Globe, one of the categories of the Queensland Globe using Google Earth: www.dnrm.qld.gov.au/mapping-data/queensland-globe.

A complete listing of the vegetation communities in each Broad Vegetation Group is available as a separate spreadsheet for download. Refer to Broad Vegetation Groups: www.qld.gov.au/environment/plants-animals/plants/ecosystems/.

Version updates

In version 1.0, the draft vegetation mapping areas were not included in the area calculations for each BVG. In version 1.1, these data are included in the area calculations, to provide a state-wide area estimate of area for each BVG.

In version 2.0, the statistics were updated from remnant 2011 to remnant 2013 figures. The regional ecosystem coverage version 9.0 included additional regional ecosystem mapping in the Northwest Highlands – Duchess and Urandangi 1:250,000 map sheets.

In version 3.0, the statistics throughout the document were updated from remnant 2013 to remnant 2015 figures from Accad *et al*. (2017), and for the first time are based on a state-wide RE coverage. The RE coverage version 10.0 used included completed RE mapping in the Channel Country bioregion – Brighton Downs, Connemara and Birdsville 1:250,000 map sheets, and Mornington Island in Gulf Plains bioregion. It also included more detailed mapping (1:50,000 scale) for parts of Southeast Queensland and New England Tableland Bioregions, and 1:25,000 scale for the Brisbane City Council area.

In this version (version 4.0), the statistics throughout the document have been updated from remnant 2015 to remnant 2017 figures from Accad et al. (2019). This version also includes the results of 1:25 000 scale RE mapping for Brisbane City Council and Gold Coast City Council areas being incorporated into the Queensland wide RE coverage. There has been a significant revision of the REs in Cape York Peninsula, Gulf Plains and the Northwest Highlands bioregions using the numerical classification of the CORVEG data (Addicott et al. 2018) as a guide. This has resulted in the amalgamation of a number of REs in Cape York Peninsula, and recognition of new REs in Gulf Plains, Northwest Highlands and Southeast Queensland bioregions. Appendix 6 has been added which lists all regional ecosystems corresponding to ecological communities listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 at January 2019. The discussion regarding *Callitris* spp. vegetation below has also been added.

Callitris spp. vegetation in Queensland

Callitris Forests and Woodlands are recognised as Major Vegetation Group7 by the Commonwealth government (Department of Environment and Water Resources (2007). In Queensland, there are eight species of native Cypress pines (*Callitris* spp.), with the most widespread species *Callitris glaucophylla* being the basis of the timber industry in south western Queensland. *Callitris* spp. are frequently present in the subcanopy of a number of eucalypt dominated REs. *Callitris* spp. density can be impacted by fire history and previous management. BVG20a represents the REs where *Callitris glaucophylla* or *C. intratropica* are generally dominant or codominant in the canopy. However if the full extent of *Callitris* spp. is required, the additional REs containing *Callitris* spp. listed below should be added to the REs in BVG20a.

Callitris glaucophylla occurs in the subcanopy in REs in BVG9h (12.8.26), 10a (11.12.6a), 11a (11.8.5a), 12a (11.10.4, 11.10.7a, 11.7.4, 11.7.7), 13d (11.5.20), 17a (6.3.24a, 6.5.3, 6.5.5, 11.3.2c, 11.3.6, 11.3.18, 11.4.12, 11.5.3, 11.5.13, 11.10.11), 17b (11.3.6, 11.3.39, 11.5.5a, 11.5.5c, 13.11.4), 18a (11.3.14, 11.5.21) and 18b (11.5.1, 11.5.4); and dominates the biomass of the REs in BVG20a (6.3.16, 6.3.17, 6.5.19, 11.3.19, 11.5.4a, 11.5.5c, 11.5.12, 11.8.9, 11.10.6b, 11.10.9, and 11.12.6).

Callitris intratropica occurs in the subcanopy in REs in BVG2c (3.5.33, 3.10.3), 3a (3.2.17), 7a (9.12.8c), 9e (9.5.5), 10b (7.12.30),12a (2.10.2), 13a (9.11.10, 9.12.20, 9.12.30a), 13c (7.11.41, 9.12.13c, 9.12.14, 9.12.17, 9.12.18), 14d (9.10.1), 21a (9.5.15), 24a (9.10.3a), 28c (3.5.42),29a (3.3.53) and 29b (9.12.43b) dominates the biomass of the REs in BVG20a (2.5.4, 2.10.5c, 9.5.17and 9.12.4c).

Callitris endlicheri is codominant in the canopy in REs 12.9-10.18 and 13.11.1, and occurs in the subcanopy in REs 11.12.5, 13.12.2, 13.12.3 and 13.12.5. This REs are part of BVG 9h or 15a.

Callitris columellaris is a component of the subcanopy of RE12.2.5 and 12.2.11 both which are in BVG 9f.

Callitris baileyi is a minor component of the subcanopy in RE11.8.8 and 11.9.9a.

Callitris macleayana, C. monticola and *C. rhomboidea* are more restricted in their distribution, and generally are not characteristic of any particular RE.

Broad Vegetation Group descriptions

The broad vegetation group descriptions include the following information. More definitions can be found in the glossary (Appendix 3).

Title	Description of the dominant and most frequent species, structural formations and habitat of the broad vegetation group.
Pre-clearing area	The area of the broad vegetation group before clearing (in hectares).
Remnant 2017 area	The remnant area of the broad vegetation group (in hectares) and as a percentage of pre-clearing extent.
Bioregions	The pre-clearing area of the BVG is listed by the bioregions it occurs in, in decreasing percentage of BVG pre-clearing area. Only bioregions where >1% of the BVG distribution occurs are listed.
Land zones	The pre-clearing area of the BVG is listed by the land zones (Wilson and Taylor 2012) it occurs in, in decreasing percentage of BVG pre-clearing area. Land zones making up <1% are not listed. Land zone 1: deposits subject to periodic tidal inundation (tidal flats and beaches). Land zone 2: Quaternary coastal sand deposits (coastal dunes). Land zone 3: recent Quaternary alluvial systems (alluvial river and creek flats). Land zone 4: Tertiary-early Quaternary clay plains (clay plains). Land zone 5: Tertiary-early Quaternary loamy and sandy plains and plateaus (old loamy and sandy plains). Land zone 6: Quaternary inland dunefields (inland dunefields). Land zone 7: Cainozoic duricrusts (ironstone jump-ups). Land zone 8: Cainozoic igneous rocks (basalt plains and hills). Land zone 9: fine grained sedimentary rocks (undulating country on fine-grained sedimentary rocks). LZ9 and 10 are combined (LZ9-10) in SEQ bioregion. Land zone 10: coarse grained sedimentary rocks (sandstone ranges). Land zone 11: metamorphic rocks (hills and lowlands on metamorphic rocks). Land zone 12: Mesozoic to Proterozoic igneous rocks (hills and lowlands on granitic rocks).
Mean annual rainfall (mm)	Range of mean annual rainfall experienced over the majority of the pre-clearing distribution of the BVG.
Typical land forms	Most frequent land forms (Speight 2009) that the BVG occurs on.
Typical soils	Most frequent soils (McKenzie *et al.* 2004) that the BVG occurs on.
Structural Formation Range	Most frequent structural formations (Neldner *et al.* 2017b) that the BVG form.
Floristic description	A brief generalised description of the characteristic species in each BVG. Nomenclature follows Bostock and Holland 2018). Only the most frequent species are mentioned for each layer, and some structural information of the typical vegetation provided. Where tree species are mentioned in the canopy, the same species is not repeated even though it is frequently present in the subcanopy, low tree or shrub layers. Low tree and shrub layers are frequently combined for brevity. Typical species in the ground layer are listed. These descriptions are brief and generalised, and do not include naturalised species.

The status listed in the Tables of regional ecosystems making up each BVG is the Biodiversity Status which uses the latest current extent of remnant vegetation and an assessment of the condition of the remnant vegetation which includes expert opinion. Endangered (E), Of concern (OC) or No concern at present (NC) are defined online under regional ecosystems. A limited number of regional ecosystems are included in threatened ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation* (*EPBC*) *Act*. These regional ecosystems are listed under the appropriate BVG. Summary information for each broad vegetation group is given in the next section. A complete listing of the vegetation communities in each BVG is available as a separate spreadsheet for download. National Parks (NP) and State Forests (SF) have been abbreviated in photo captions.

1 Complex mesophyll to notophyll vine forests of the Wet Tropics bioregion

1a Complex mesophyll to notophyll vine forests usually in fertile and very wet locations

Pre-clearing area: 110,239 ha

Remnant 2017 area: 28,846 ha (26.2% of pre-clearing)

Bioregions: WET (99.6%) CYP (0.4%)

Land zones: 3 (70%), 8 (28%), 12 (1%), 11 (1%)

Mean annual rainfall range: 2000-4200 mm

Typical landforms: Alluvial plains, lowlands and footslopes, occasionally on steep slopes

Typical soils: Well- to poorly-drained Rudosols, and Red Ferrosols, Red Kandosols

Structural formation range: Complex mesophyll to notophyll vine forest

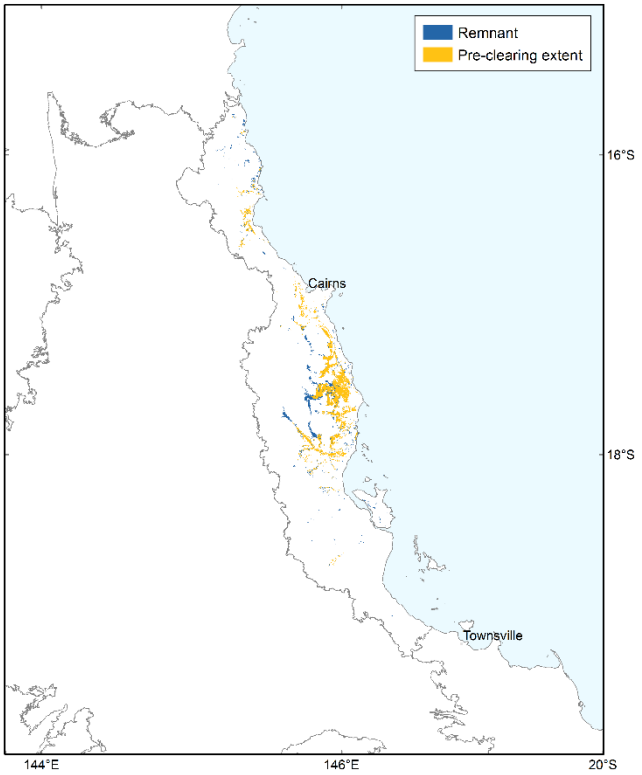


Photo 1 Complex mesophyll vine forest, 7.8.1a, North Mission Beach, WET. (CSIRO AJ Ford)

Floristic characteristics: Scattered emergent strangling *Ficus* spp. may occur, especially *F. pleurocarpa*. The dense canopy is usually at least 25 m tall and frequently includes *Acmena graveolens, Argyrodendron peralatum, Alstonia scholaris, Cananga odorata, Canarium vitiense, Castanospermum australe, Dysoxylum mollissimum, D. pettigrewianum, Elaeocarpus grandis, Ficus variegata, Palaquium galactoxylon, Planchonella myrsinodendron, Syzygium sayeri, Terminalia sericocarpa* and *Vitex queenslandica.* Subcanopy trees may also include

Antirhea tenuiflora, Brombya platynema, Cryptocarya laevigata, Gomphandra australiana, Gossia myrsinifolia, Myristica muelleri, Pisonia umbellifera, Rockinghamia angustifolia and *Synima cordierorum.* Lianas such as *Austrosteenisia stipularis, Calamus australis, C. moti, Entada phaseoloides, Faradaya splendida* and *Merremia peltata* are frequent and climb into the canopy. The ground layer is very sparse, and may include *Bowenia spectabilis, Pandanus monticola* and sprawling *Calamus* spp. Ferns such as *Blechnum, Diplazium* and *Tectaria* spp. occur frequently, with fleshy herbs such as *Alpinia arctiflora, A. modesta, Hornstedtia scottiana, Pleuranthodium racemigerum* and *Alocasia brisbanensis* occurring frequently (see Tracey 1982 1a).

Table 2 Five most extensive regional ecosystems included in BVG 1a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.3.10a	Mesophyll vine forest on moderately to poorly-drained alluvial plains, of moderate fertility	50,905	11,860	23	E
7.8.1a	Complex mesophyll vine forest on lowlands and foothills on basalt	27,071	10,605	39	E
7.3.17	Complex mesophyll vine forest, on well-drained alluvium of high fertility	26,261	3,969	15	E
7.8.1b	Mesophyll vine forest on lowlands and foothills on basalt	3,279	53	2	E
7.12.39a	Complex mesophyll vine forest of lowlands and foothills on granite and rhyolite	923	919	100	OC

Photo 2 *Ristantia pachysperma* (yellow penda) in complex mesophyll vine forest. WET (WTMA)

Photo 3 Mesophyll vine forest, 7.3.10a, Tully River, WET. (AJ Ford, CSIRO)

Photo 4 Complex mesophyll vine forest, 7.3.17, Mossman River, WET. (AJ Ford, CSIRO)

Photo 5 Complex mesophyll vine forest, 7.3.10a on lowlands, with 7.11.1a (BVG 2a) on the ranges, near Cape Tribulation, WET. (VJ Neldner)

1b Complex mesophyll to notophyll vine forests usually on basalt tablelands

Pre-clearing area: 81,534 ha

Remnant 2017 area: 31,844 ha (39.1% of pre-clearing)

Bioregions: WET (100%)

Land zones: 8 (99%), 3 (1%)

Mean annual rainfall range: 2000-4200 mm

Typical landforms: Highland plateaus and ranges, occasionally on alluvium

Typical soils: Red Ferrosols

Structural formation range: Complex mesophyll to notophyll vine forest

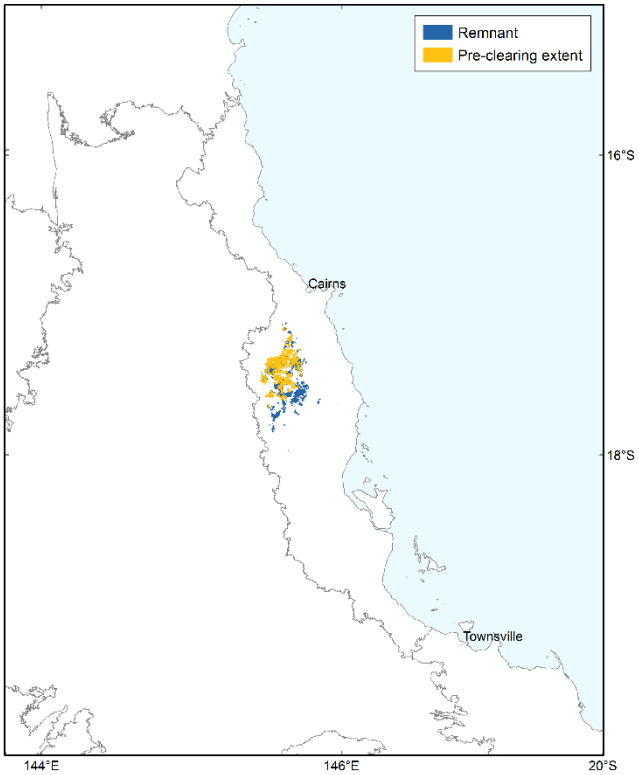


Photo 6 Complex notophyll vine forest, 7.8.4a. Koolmoon Creek, WET. (AJ Ford, CSIRO)

Floristic characteristics: The closed canopy is over 30 m tall with scattered emergent strangling *Ficus* spp., especially *Ficus crassipes* and *F. pleurocarpa.* Frequent trees include *Beilschmiedia bancroftii, B. recurva, Caldcluvia australiensis, Cardwellia sublimis, Cryptocarya oblata, Doryphora aromatica, Elaeocarpus* spp., *Endiandra monothyra, E. sankeyana, E. sideroxylon, Flindersia bourjotiana, F. brayleyana, Franciscodendron laurifolium, Galbulimima baccata, Karrabina biagiana, Opisthiolepis heterophylla, Sloanea australis, Syzygium gustavioides, S. kuranda* and *Xanthophyllum* spp. Subcanopy trees may also include *Apodytes brachystylis, Beilschmiedia tooram, Bubbia semecarpoides, Daphnandra repandula, Ficus leptoclada, Fontainea picrosperma, Gossia dallachiana, Myristica muelleri, Polyosma rhytophloia, Polyscias australiana, Rockinghamia angustifolia* and *Siphonodon membranaceus.* Canopy lianas are relatively infrequent and may include *Austrobaileya scandens, Austrosteenisia stipularis, Cissus hypoglauca, C. vinosa, Faradaya splendida* and

Gynochthodes umbellata. Light wiry vines are common and include *Cayratia japonica, Morinda retropila, Ripogonum album* and *Smilax aculeatissima.* Additional species that may occur in the mid-dense shrub layer include *Atractocarpus hirtus, Ardisia brevipedata, Haplostichanthus submontanus, Cyathea rebeccae, Diplazium* spp.*, Pilidiostigma tetramerum* and *Wilkiea angustifolia.* The ground layer is generally very sparse (see Tracey 1982 1b and 5a).

Table 3 Five most extensive regional ecosystems included in BVG 1b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.8.2a	Complex mesophyll vine forest of high rainfall, cloudy uplands on basalt	81,534	31,844	39	OC
7.8.4a	Complex notophyll vine forests of cloudy wet highlands on basalt	51,740	21,264	41	E
7.3.36a	Complex mesophyll vine forest, of high rainfall, cloudy uplands, on alluvium	28,558	10,169	36	E
7.3.36c	Complex notophyll vine forest, of high rainfall, cloudy uplands, on alluvium	950	336	35	E
7.8.4c	Complex notophyll vine forest of highlands on basalt in the moist rainfall zone.	172	16	10	E

Photo 7 Complex notophyll vine forest, 7.8.4c, Nitchaga Creek, WET.

(AJ Ford, CSIRO)

Photo 9 Complex notophyll vine forest, 7.8.2a. Topaz, WET.

(AJ Ford, CSIRO)

Photo 8 Twin kauri pines, *Agathis microstachya,* in complex notophyll vine forest, 7.8.2a. Lake Barrine, WET.

(VJ Neldner)

2 Complex to simple, semi-deciduous mesophyll to notophyll vine forests, sometimes with *Araucaria cunninghamii* (hoop pine)

2a Complex evergreen notophyll vine forests frequently with *Araucaria cunninghamii* from foothills to ranges. (Tracey 1982 5a, 5b)

Pre-clearing area: 511,652 ha

Remnant 2017 area: 376,116 ha (73.5% of pre-clearing)

Bioregions: WET (53%), SEQ (47%), CQC (0.2%), BRB (0.1%)

Land zones: 11 (46%), 12 (43%), 8 (11%)

Mean annual rainfall range: >1200mm in SEQ; >2500 mm in WET

Typical landforms: Highland plateaus and ranges, occasionally on alluvium

Typical soils: Red and Brown Dermosols, and Red Ferrosols

Structural formation range: Complex mesophyll to notophyll vine forest

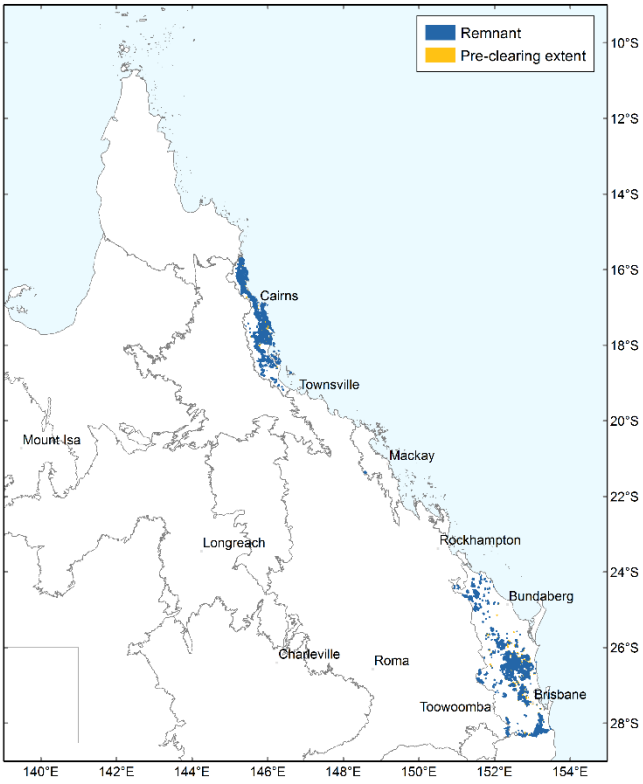


Photo 10 Mesophyll vine forest, 7.12.1a, Harvey Creek, WET.
(AJ Ford, CSIRO)

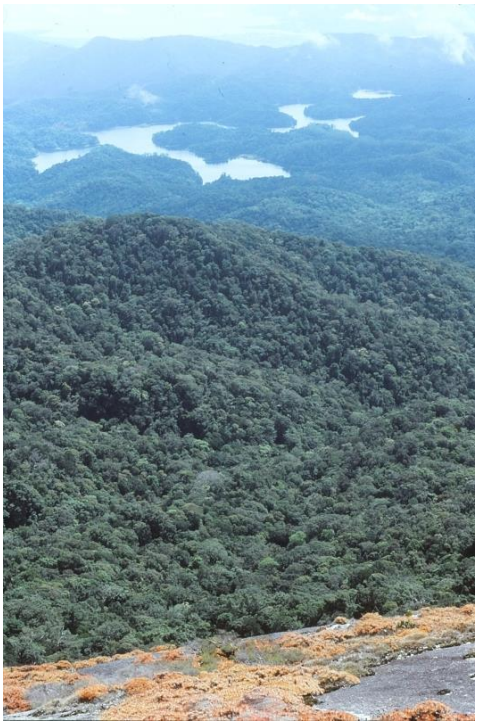


Photo 11 Mesophyll vine forest, 7.11.1a surrounding Lake Morris, from Lamb's Head, WET.
(VJ Neldner)

Floristic characteristics: (1) WET bioregion. The dense canopy is usually at least 25 m tall and frequently includes *Acacia celsa, Acmena graveolens, Argyrodendron peralatum, Beilschmiedia bancroftii, Cardwellia sublimis, Carnarvonia araliifolia, Cryptocarya oblata, Darlingia darlingiana, Doryphora aromatica, Dysoxylum pettigrewianum, Elaeocarpus bancroftii, Flindersia bourjotiana, F. pimenteliana, Gillbeea adenopetala, Palaquium galactoxylon, Planchonella myrsinodendron, Prunus turneriana, Syzygium kuranda* and *Xanthophyllum octandrum.* Frequent species in the subcanopy include *Antirhea tenuiflora, Apodytes brachystylis, Brombya platynema, Citronella smythii, Davidsonia pruriens, Gossia myrsinocarpa, Helicia nortoniana, Medicosma fareana, Myristica globosa, Pilidiostigma tropicum, Polyscias australiana, Rockinghamia angustifolia, Steganthera laxiflora* and *Toechima erythrocarpum.* Additional species that may occur in the mid-dense shrub layer include *Ardisia brevipedata, Atractocarpus hirtus, Austromatthaea elegans, Lasianthus kurzii, Linospadix minor, Pandanus monticola* and *Psychotria* spp*.* Vines tend to be very common especially *Austrosteenisia stipularis, Calamus* spp., *Connarus conchocarpus, Faradaya splendida, Freycinetia excelsa, Melodinus australis, Melodorum uhrii* and *Tetracera* spp. Following disturbances (such as cyclones) *Musa banksii* can become very prominent. The ground layer is generally sparse and may include the fern *Blechnum cartilagineum* and the herbs *Alpinia arctiflora, Pleuranthodium racemigerum* and *Bowenia spectabilis* (see Tracey 1982 5a & 5b).

(2) SEQ bioregion. *Araucaria cunninghamii* is frequently present as emergent trees to 30 metres tall. The dense canopy is usually at least 20 m tall and frequently includes *Argyrodendron trifoliolatum, Argyrodendron* sp. (Kin Kin W.D.Francis AQ81198), *Dendrocnide* spp., *Archidendropsis thozetiana, Vitex lignum-vitae, Aphananthe philippinensis, Cryptocarya* spp., *Elaeocarpus obovatus, Euroschinus falcatus* var*. falcatus, Ficus* spp., *Flindersia australis* and *Geijera salicifolia. Austrosteenisia blackii* and *Cissus* spp. are also frequently present in the canopy.

Additional species that occur in the mid-dense subcanopy include *Gossia bidwillii, Diospyros geminata, D. fasciculosa, Polyscias elegans, Psydrax lamprophylla, Alectryon* spp*., Baloghia inophylla* and *Drypetes deplanchei.*

Additional species that may occur in the mid-dense shrub/ low tree layer include *Alchornea ilicifolia, Cleistanthus cunninghamii, Capparis arborea, Turraea pubescens, Carissa ovata, Croton* spp., *Breynia oblongifolia, Mallotus philippensis, Wilkiea macrophylla, Acalypha eremorum, Acronychia laevis, Alyxia ruscifolia, Arytera divaricata, Atractocarpus chartaceus* and *Ixora beckleri.*

The ground layer is generally sparse, but can include grasses such as *Oplismenus aemulus, O. imbecillis* and *Ottochloa gracillima,* sedges such as *Cyperus enervis* and *C. tetraphyllus,* vines such as *Smilax australis, Hoya australis* subsp*. australis, Geitonoplesium cymosum, Dioscorea transversa* and *Melodorum leichhardtii,* ferns such as *Pellaea paradoxa* or forbs such as *Pseuderanthemum variabile.*

Table 4 Five most extensive regional ecosystems included in BVG 2a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.11.1a	Mesophyll vine forest on very wet and wet lowlands and foothills on metamorphics	145,667	126,673	87	NC
7.12.1a	Mesophyll to notophyll vine forest on granite and rhyolite lowlands and foothills	123,424	118,735	96	NC
12.11.10	Notophyll vine forest +/- *Araucaria cunninghamii* on metamorphics +/- interbedded volcanics	87,082	39,122	45	NC
12.12.13	Araucarian Complex microphyll to notophyll vine forest on Mesozoic to Proterozoic igneous rocks	63,212	38,309	61	NC
12.12.16	Notophyll vine forest on Mesozoic to Proterozoic igneous rocks	33,723	23,668	70	NC

The regional ecosystems 12.8.3, 12.8.4, 12.11.10 and 12.12.16 from this BVG form part of the *EPBC Act* critically endangered listed Lowland Rainforest of Subtropical Australia. Lowland Rainforest occurs in areas <300 m above sea level with high annual rainfall (>1300 mm).

Photo 12 Complex notophyll vine forest,12.8.3 Darlington Range, Lamington NP, SEQ.
(WJF McDonald)

Photo 13 Complex notophyll vine forest,12.8.3 Natural Bridge, Springbrook NP, SEQ.
(WJF McDonald)

Photo 14 Complex notophyll vine forest, 12.8.3. Palm Grove NP, Mount Tamborine, SEQ.
(VJ Neldner)

Photo 15 Complex notophyll vine forest with *Araucaria bidwillii* emergents, 12.8.4. Bunya Mountains NP, SEQ.
(WJF McDonald)

2b Semi-deciduous mesophyll to notophyll vine forests usually on granitic ranges

Pre-clearing area: 22,944 ha

Remnant 2017 area: 22,898 ha (99.8% of pre-clearing)

Bioregions: CYP (100%)

Land zones: 12 (100%)

Mean annual rainfall range: 1200-2000 mm

Typical landforms: Highland plateaus and ranges, occasionally on alluvium

Typical soils: Yellow Kandosols or Yellow Dermosols

Structural formation range: Semi-deciduous mesophyll to notophyll vine forest

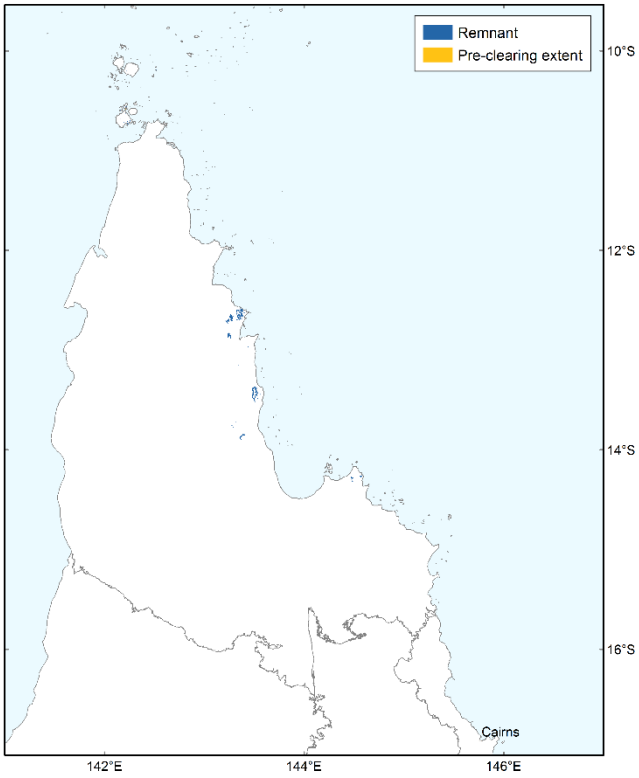


Photo 16 *Araucaria cuninghamii* notophyll vine forest on steep granitic boulder slopes, 3.12.2. Cape Melville NP, CYP. (F Nissen, QPWS)

Floristic characteristics: Emergent *Araucaria cunninghamii* trees to 30 metres height are sometimes present. *Canarium australianum, Bombax ceiba* var*. leiocarpum, Buchanania arborescens, Antiaris toxicaria* var*. macrophylla, Sterculia quadrifida, Acacia auriculiformis, A. polystachya, Aidia racemosa, Albizia lebbeck, Beilschmiedia obtusifolia, Dysoxylum acutangulum, Maranthes corymbosa, Myristica insipida, Polyscias elegans* and *Terminalia subacroptera* are frequent in the canopy which is usually greater than 20 m tall. Subcanopy trees include *Aidia racemosa, Cryptocarya hypospodia, Cleistanthus peninsularis, Cupaniopsis anacardioides, Garcinia warrenii, Miliusa horsfieldii* and *Polyalthia nitidissima,* and the vine *Entada rheedei.* Additional species in the low tree/ shrub layer include *Glycosmis trifoliata, Micromelum minutum, Phaleria octandra, Atractocarpus sessilis, Cupaniopsis flagelliformis* var*. flagelliformis, Drypetes deplanchei, Eugenia reinwardtiana, Litsea glutinosa, Murraya ovatifoliolata, Myrsine porosa, Wilkiea rigidifolia, Aglaia elaeagnoidea, Alyxia spicata, Arytera bifoliolata, Breynia cernua, Brucea javanica, Dimorphocalyx australiensis, Exocarpos latifolius, Memecylon pauciflorum, Opilia amentacea, Pleomele angustifolia* and *Salacia disepala.* The

ground layer is very sparse with occasional *Abrus precatorius, Drynaria quercifolia, Hypoestes floribunda* and seedling trees.

Table 5 Five most extensive regional ecosystems included in BVG 2b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.12.3c	Semi-deciduous mesophyll / notophyll vine forest with acacias on poorly drained podzolic soils from granite	14,320	14,320	100	NC
3.12.2	Araucarian notophyll vine forest on granitic ridges and mountains	7,623	7,623	100	OC
3.12.35d	Tall semi-deciduous vine forest on diorite knolls	389	389	100	OC
3.12.35e	Semi-deciduous vine forest on diorite boulder slopes	291	250	86	OC
3.12.35a	Semi-deciduous notophyll vine forest and occasional thicket on Torres Strait islands	190	186	98	OC

Photo 17 Semi-deciduous notophyll vine forest, 3.12.3. Cape Melville, CYP.
(PI Forster)

Photo 18 *Wodyetia bifurcata*, 3.12.6. Cape Melville NP, CYP. (JP Stanton)

Photo 19 Simple evergreen notophyll vine forest with *Wodyetia bifurcata*, 3.12.6. Eastern fall of Melville Range, CYP.
(JP Stanton)

2c Semi-deciduous notophyll vine forests to simple evergreen notophyll vine forests, frequently with *Welchiodendron longivalve* on northern Cape York Peninsula

Pre-clearing area: 78,831ha

Remnant 2017 area: 78,451 ha (99.5% of pre-clearing)

Bioregions: CYP (100%)

Land zones: 5 (83%), 12 (17%)

Mean annual rainfall range: 1600-2000 mm

Typical landforms: Undulating plateaus and low ranges, occasionally on alluvium

Typical soils: Yellow and Red Kandosols

Structural formation range: Semi-deciduous notophyll to simple evergreen notophyll vine forest

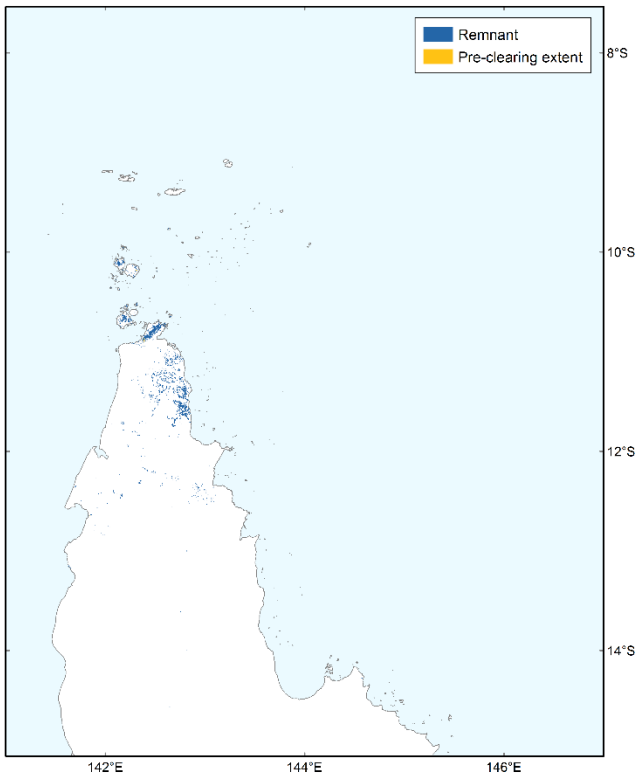


Photo 20 Semi-deciduous notophyll vine forest, 3.5.4. NE of Weipa, CYP.
(VJ Neldner)

Floristic characteristics: Emergent trees rarely occur. The even canopy is usually at least 17m tall with *Welchiodendron longivalve, Acacia polystachya, Canarium australianum, Buchanania arborescens, Endiandra glauca, Alstonia actinophylla, A. spectabilis, Blepharocarya involucrigera, Sterculia quadrifida, Planchonella chartacea, P. sericea, Flindersia ifflaiana, Syzygium forte, Beilschmiedia obtusifolia, Podocarpus grayae, Bombax ceiba* var*. leiocarpum, Cryptocarya cunninghamii* and *Halfordia kendack* frequently occurring. Additional species that can occur in the mid-dense canopy layer are *Flagellaria indica, Chionanthus ramiflora, Ptychosperma elegans, Choriceras tricorne, Drypetes deplanchei, Dysoxylum oppositifolium, Myristica insipida* and *Pachygone ovata.* The mid-dense shrub/ low tree layer frequently includes the additional species *Tabernaemontana orientalis, Atractocarpus sessilis, Wilkiea rigidifolia, Pleomele angustifolia, Alyxia spicata, Micromelum*

minutum, Glycosmis trifoliata, Haplostichanthus fruticosus and *Memecylon pauciflorum.* The ground layer is very sparse with very occasional *Pseuderanthemum variabile, Curcuma australasica* and *Drynaria quercifolia.*

Table 6 Five most extensive regional ecosystems included in BVG 2c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.5.33	Simple evergreen notophyll vine forest on sand plains	40,090	40,090	100	OC
3.5.4	Semi-deciduous notophyll vine forest in small patches on northern plateaus	14,797	14,780	100	NC
3.5.3	Semi-deciduous notophyll vine forest restricted to lateritic Carnegie Tableland	10,170	9,958	98	OC
3.12.4a	Notophyll vine forest of *Welchiodendron longivalve* on low hills and rises	6,177	6,026	98	OC
3.12.20	Evergreen notophyll vine forest dominated by *Welchiodendron longivalve* on headlands	5,500	5,499	100	OC

The regional ecosystem 3.12.20 from this BVG forms part of the *EPBC Act* critically endangered listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

Photo 21 Semi-deciduous notophyll vine forest, 3.5.3, Lockerbie Scrub near Bamaga, CYP.
(VJ Neldner)

Photo 22 *Welchiodendron longivalve* evergreen notophyll vine forest, 3.12.20. Mubuiag Island, CYP.
(DG Fell)

2d Semi-deciduous notophyll/mesophyll vine forests on coastal ranges. (Tracey 1982 4, 5b on basalt, metamorphics and granite)

Pre-clearing area: 47,100 ha

Remnant 2017 area: 26,245 ha (55.7% of pre-clearing)

Bioregions: CYP (53%), WET (47%),

Land zones: 11 (45%), 12 (43%), 8 (11%)

Mean annual rainfall range: 1600-3200 mm

Typical landforms: Highland plateaus and ranges, occasionally on alluvium

Typical soils: Red Ferrosols, and Yellow and Red Dermosols

Structural formation range: Semi-deciduous mesophyll to notophyll vine forest

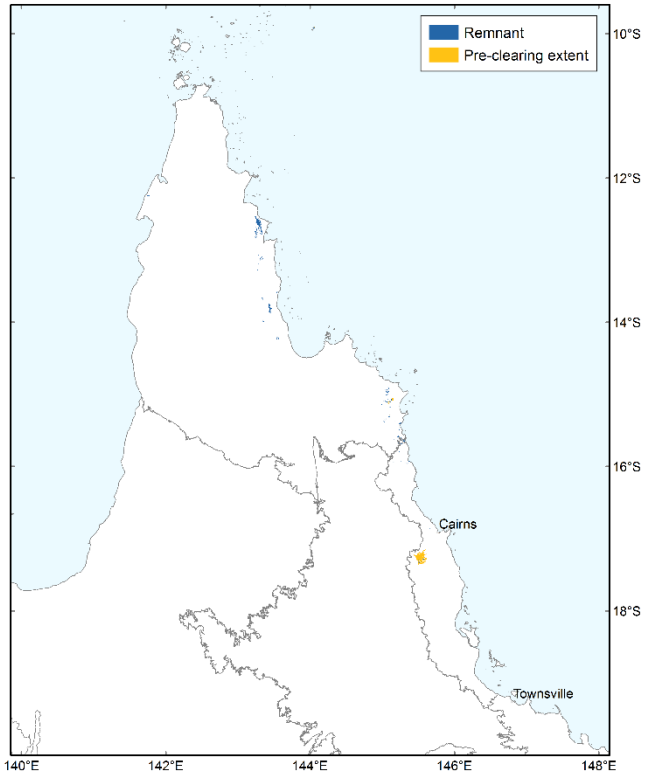


Photo 23a and b Semi-deciduous notophyll vine forest, 7.8.3a. Wongabel SF, WET.
(C Clarke, WTMA)

Floristic characteristics: Emergent trees taller than 30 m of *Argyrodendron* spp., *Bombax ceiba* var. *leiocarpum, Ficus virens* and *F. obliqua* may occur. The dense canopy is generally greater than 20 m tall and frequently contains *Alstonia scholaris, A. spectabilis, Aleurites moluccanus, Diospyros hebecarpa, Beilschmiedia obtusifolia, Myristica globosa, Cryptocarya hypospodia, C. rhodosperma, Flindersia brayleyana, Argyrodendron polyandrum, Buchanania*

arborescens, Dysoxylum pettigrewianum, Terminalia sericocarpa, Wrightia laevis, Adenanthera pavonina, Canarium australianum, C. vitiense, Toona ciliata, Endiandra longipedicellata, Ganophyllum falcatum, Vitex queenslandica and *Miliusa horsfieldii.* Additional tree species that may occur in the subcanopy include *Arytera divaricata, Chionanthus ramiflora, Mallotus philippensis, Arytera bifoliolata, Pisonia umbellifera, Ptychosperma elegans, Cryptocarya triplinervis, Calophyllum sil* and *Aidia racemosa.* A sparse shrub layer is usually present with *Glycosmis trifoliata, Eugenia reinwardtiana, Micromelum minutum, Codiaeum variegatum, Pleomele angustifolia, Hodgkinsonia frutescens* and *Phaleria octandra* frequently occurring. Woody canopy vines and large root climbers (*Epipremnum pinnatum*) can be prominent, especially *Dalbergia densa, Strychnos minor, Trophis scandens, Cissus* spp. and *Austrosteenisia blackii.* Very sparse seedlings are present in the ground layer (see Tracey 1982 4, 5b).

Table 7 Five most extensive regional ecosystems included in BVG 2d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.8.3a	Complex semi-evergreen notophyll vine forest of uplands on basalt	18,920	869	5	E
3.11.1	Evergreen to semi-deciduous mesophyll / notophyll vine forest on metamorphic slopes and plateaus on Iron and McIlwraith Ranges	16,149	16,140	100	OC
3.8.2a	Semi-deciduous notophyll/microphyll vine forest on basalt rises	3,659	2,464	67	OC
3.11.2	Semi-deciduous mesophyll vine forest on metamorphic ranges in the south	3,532	3,532	100	E
7.3.37	Complex semi-evergreen notophyll vine forest of uplands on alluvium	1,362	8	1	OC

The regional ecosystems 7.8.3 and 7.3.37 from this BVG form the *EPBC Act* critically endangered listed Mabi Forest (Complex Notophyll Vine Forest 5b)

Photo 24 Semi-deciduous notophyll vineforest, 7.8.3a. Tolga Scrub, WET.
(AJ Ford,CSIRO)

3 Notophyll vine forests/ thickets (sometimes with sclerophyll and/or Araucarian emergents) on coastal dunes and sand masses

3a Evergreen to semi-deciduous, notophyll to microphyll vine forests/ thickets on beach ridges and coastal dunes, occasionally *Araucaria cunninghamii* (hoop pine) microphyll vine forests on dunes. *Pisonia grandis* on coral cays

Pre-clearing area: 99,794 ha

Remnant 2017 area: 94,979 ha (95.2% of pre-clearing)

Bioregions: CYP (67%), GUP (17%), SEQ (7%), WET (4%), BRB (3%), CQC (3%)

Land zones: 2 (100%)

Mean annual rainfall range: > 1200 mm

Typical landforms: Beach ridges, coastal dunes, sand islands and coral atolls

Typical soils: Aeric Podosols, Semiaquic Podosols or Bleached-Orthic Tenosols

Structural formation range: Notophyll vine forest to semi-evergreen microphyll vine thicket

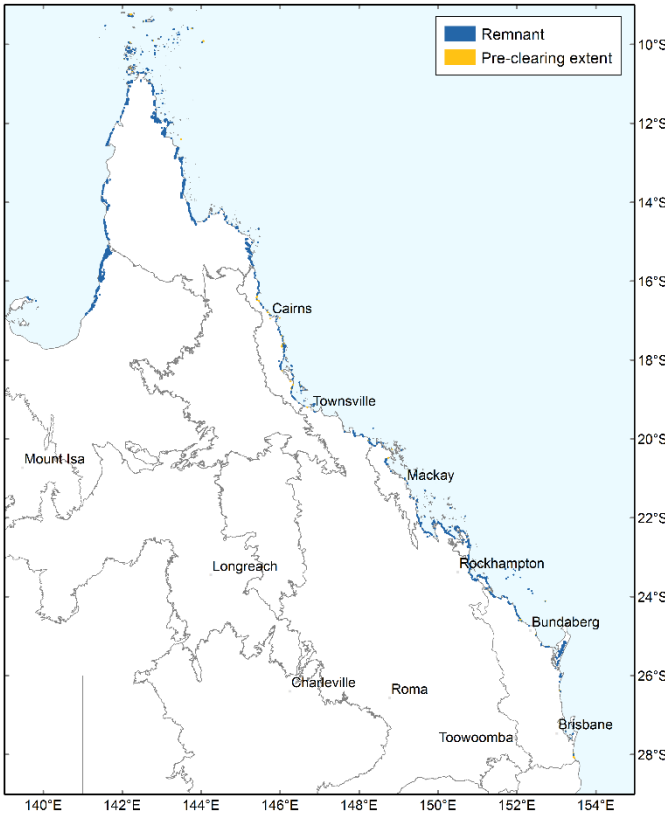


Photo 25 Notophyll vine forest, 3.2.2a. Pormpuraaw, CYP. (AJ Ford, CSIRO)

Photo 26 *Araucaria cunninghamii* emergents above *Asteromyrtus angustifolia* microphyll vine forest, 3.2.12. Cape Flattery, CYP. (VJ Neldner)

Floristic characteristics (CYP, GUP, WET, CQC): *Araucaria cunninghamii* occasionally occurs as an emergent tree to 25 m tall. The dense canopy is generally greater than 10 m tall and includes a mixture of deciduous and evergreen trees including *Terminalia muelleri,*

Manilkara kauki, Mimusops elengi, Pleiogynium timorense, Gyrocarpus americanus, Sterculia quadrifida, Buchanania arborescens, Acacia polystachya, Celtis paniculata, Acacia crassicarpa, Syzygium forte, Drypetes deplanchei, Canarium australianum, Pandanus tectorius and *Cupaniopsis anacardioides.* Species that may be present in the sparse shrub/low tree layer include *Exocarpos latifolius, Sersalisia sericea, Micromelum minutum, Millettia pinnata, Eugenia reinwardtiana, Elaeodendron melanocarpum, Polyalthia nitidissima, Endiandra glauca, Diospyros geminata, Litsea glutinosa, Antirhea ovatifolia, Psychotria poliostemma, Memecylon pauciflorum, Atractocarpus sessilis, Ficus opposita, Premna serratifolia, Aglaia elaeagnoidea* and *Tabernaemontana orientalis.* Vines are prominent and include *Alyxia spicata, Abrus precatorius, Tetracera nordtiana* and *Rhamnella vitiense.* There are very few herbs present in the ground layer, although annual species can be conspicuous during the wet season. *Pisonia grandis* dominates simple closed forests on the coral cays. Mesophyll-notophyll vine forests in the Wet Tropics bioregion (e.g. 7.2.1a-c, e and f) tend to be better developed and species rich, and are floristically more similar to adjacent mesophyll rainforest types.

Floristic characteristics (SEQ, BRB): Generally occurs with a wind-sheared canopy 8-15 m high, taller in more sheltered hind-dune and swale situations. The dense canopy is dominated by *Cupaniopsis anacardioides, Pleiogynium timorense, Celtis paniculata, Drypetes deplanchei, Mallotus discolor, Sersalisia sericea, Alectryon conatus,* and *Bridelia leichhardtii. Euroschinus falcatus, Corymbia tessellaris* and *Ficus rubiginosa* frequently occur as emergent trees to 20 m tall. *Polyalthia nitidissima and Exocarpos latifolius* are frequent subcanopy trees. The mid-dense shrub layer frequently contains *Alyxia ruscifolia, Ixora queenslandica, Micromelum minutum* and *Carissa ovata. Trophis scandens* and *Jasminum* spp. are frequently present climbers. *Cyperus* spp. and *Microsorum punctatum* occur in the sparse ground layer.

On the parabolic dunes of the Fraser Island and Cooloola sand masses there are communities 10-15 m high more or less dominated by *Backhousia myrtifolia*, with emergents 20-35 m high of *Araucaria cunninghamii* together with *Agathis robusta* and *Lophostemon confertus*. Other canopy species include *Halfordia kendack*, *Euroschinus falcatus, Flindersia bennettii, Syzygium oleosum* and (locally) *Syzygium luehmannii.* There is a sparse shrub layer and the patchy ground layer is dominated by *Macrozamia douglasii.*

Table 8 Five most extensive regional ecosystems included in BVG 3a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.2.17	*Leucopogon yorkensis* open scrub on dunefields	18,080	18,066	100	OC
2.2.3	Semi-deciduous microphyll vine thicket on coastal dunes.	16,808	16,805	100	NC
3.2.2a	Semi-deciduous vine thicket on coastal dunes and beach ridges	12,776	12,721	100	NC
3.2.12a	*Acacia crassicarpa* and/or *Syzygium banksii* low closed forest on coastal dunes and beach ridges	12,312	12,312	100	NC
3.2.12b	Araucarian microphyll low closed forest on coastal dunefields and beach ridges	12,116	12,051	99	NC

The following regional ecosystems 3.2.1a, 3.2.1b, 3.2.11, 3.2.12, 3.2.13, 3.2.28, 3.2.29, 3.2.31, 7.2.1a, b, c, e, f & i; 7.2.2a-h, 7.2.5a, 7.2.6b, 8.2.2 and 12.2.2 form part of the *EPBC Act* critically endangered listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia. RE11.2.3 forms part of the endangered semi-evergreen vine thickets of the Brigalow Belt and Nandewar bioregions.

Photo 27 Low microphyll vine forest on coastal dunes and beach ridges, 3.2.11. Chilli Beach, CYP.
(VJ Neldner)

Photo 28 Araucarian microphyll/ notophyll vine forest on parabolic high dunes, 12.2.3. Lake Allom, Fraser Island, SEQ.
(JP Stanton)

Photo 29 Low microphyll/notophyll vine thicket (beach scrub) on coastal dunes, 8.2.2. South Percy Island, CQC.
(JE Kemp)

Photo 30 *Pisonia grandis* low closed forest, 12.2.21a. Wreck Island, Capricornia Cays NP, SEQ.
(GN Batianoff)

4 Notophyll and mesophyll vine forests with feather or fan palms on alluvia, along streamlines and in swamps on ranges or within coastal sand masses

4a Notophyll and mesophyll vine forests with feather or fan palms in alluvia and in swampy situations on ranges or within coastal sand masses

Pre-clearing area: 47,669 ha

Remnant 2017 area: 31,302 ha (65.7% of pre-clearing)

Bioregions: SEQ (57%), WET (35%), CQC (7%)

Land zones: 3 (40%), 11 (30%), 12 (20%), 2 (9%)

Mean annual rainfall range: > 1600 mm

Typical landforms: Narrow gullies or swamps on ranges; streamlines on alluvial plains; and swamps in dune swales

Typical soils: Stratic Rudosols, Yellow and Brown Dermosols and Aquic Podosols

Structural formation range: Simple notophyll to mesophyll vine forest, generally with a subcanopy dominated by feather or fan palms

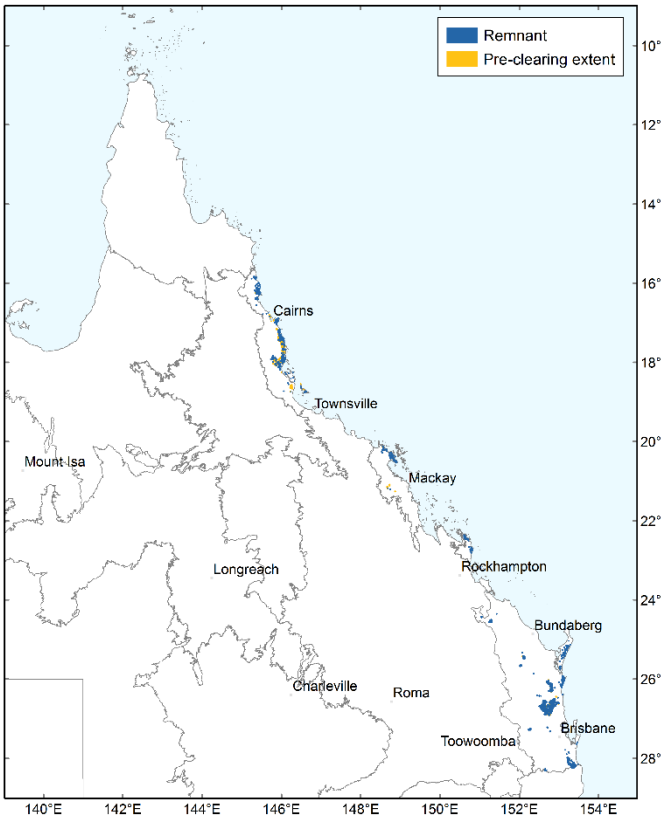


Photo 31 Mesophyll vine forest, 7.3.10c, Silky Oak, WET.
(AJ Ford, CSIRO)

Floristic characteristics (WET): The closed canopy is usually at least 15 m tall with frequent tree species including *Acmena hemilampra, Alstonia scholaris, Beilschmiedia obtusifolia, Cananga odorata, Cryptocarya hypospodia, Cryptocarya mackinnoniana, Elaeocarpus grandis, Myristica globosa, Nauclea orientalis, Melicope elleryana* and *Syzygium tierneyanum.* The dense subcanopy is often dominated by the palms *Archontophoenix alexandrae* or less extensively *Licuala ramsayi.* Additional subcanopy tree species include *Acmenosperma*

claviflorum, Carallia brachiata, Cryptocarya triplinervis var. *riparia, Ficus congesta, Helicia nortoniana, Ilex arnhemensis, Macaranga polyadenia, Polyscias australiana, Planchonella chartacea, Rhodamnia sessiliflora* and *Symplocos puberula.* Frequent lianas and vines include *Connarus conchocarpus, Faradaya splendida, Freycinetia scandens, Piper caninum* and *Trophis scandens.* The ground layer is usually sparse but can be dominated by *Pandanus monticola* and rosettes of *Calamus* as well as *Cordyline cannifolia, Hypolytrum nemorum, Helminthostachys* and *Oplismenus* occasionally being present.

Photo 32 *Licuala ramsayi* fan palm swamp, 7.11.2. Cape Tribulation, Daintree NP, WET.
(GW Wilson)

Photo 33 *Archontophoenix alexandrae* feather palm forest, 7.3.3a. Russell River, WET.
(C Clarke, WTMA)

Floristic characteristics SEQ (Fraser Island & Cooloola) and CQC (Shoalwater Bay):

The closed canopy is usually 20-25 m high with frequent tree species including *Syzygium luehmannii, Canarium australasicum, Pleioluma queenslandica, Schizomeria ovata, Calophyllum australianum, Elaeocarpus grandis, Endiandra discolor, Cryptocarya macdonaldii, C. vulgaris, Archontophoenix cunninghamiana* and *A. alexandrae* (CQC). Emergent trees up to 35 m tall include *Araucaria cunninghamii, Lophostemon confertus,* and on Fraser Island and Cooloola, *Agathis robusta* and *Syncarpia hillii.* Lower tree species include *Mischarytera lautereriana, Mischocarpus pyriformis, Halfordia kendack, Litsea leefeana, L. fawcettiana, Planchonella chartacea, Melicope vitiflora, Syzygium oleosum, Synoum glandulosum, Cryptocarya glaucescens, Guioa acutifolia, Cinnamomum baileyanum, Rhodamnia acuminata, Polyalthia nitidissima* and *Sarcopteryx stipata*. On the margins, *Backhousia myrtifolia* is frequent, while *Syzygium johnsonii* and *Myrsine arenaria* occur near springs and permanent streams. Frequent climbers include *Callerya megasperma, Cissus hypoglauca, C. sterculiifolia, Freycinetia scandens, Hypserpa decumbens, Gynochthodes jasminoides, Melodinus australis, Piper hederaceum, Trophis scandens* and *Smilax* spp. The open shrub layer includes *Alyxia ruscifolia, Cordyline rubra, Eupomatia laurina, Neolitsea dealbata, Myrsine subsessilis, Mackinlaya macrosciadea, Psychotria loniceroides* and *Tasmannia insipida.* The ground layer is very sparse with *Cyperus* spp., *Calanthe triplicata, Pellaea falcata,* and *Schizaea dichotoma.*

Floristic characteristics SEQ (Conondale Range & Mt Glorious) (Kroombit & Bulburin):

The closed canopy is 20-25 m high and may consist of *Pseudoweinmannia lachnocarpa, Sloanea woollsii, Schizomeria ovata, Cryptocarya macdonaldii, C. erythroxylon, Elaeocarpus grandis, Caldcluvia paniculosa, Cinnamomum oliveri, Syzygium corynanthum, S. crebrinerve, Canarium australasicum, Planchonella australis, Litsea reticulata, Beilschmiedia obtusifolia, Argyrodendron trifoliolatum, A. actinophyllum* subsp. *actinophyllum, Citronella moorei, Gmelina leichhardtii, Endiandra discolor, Doryphora sassafras, Diospyros pentamera, Diploglottis australis,* and *Elaeocarpus kirtonii.* At Kroombit Tops *Ceratopetalum apetalum* and *Sloanea macbrydei* are present in the canopy .Emergent *Lophostemon confertus, Ficus watkinsiana, Eucalyptus grandis* or *Araucaria bidwillii* trees up to 50m tall may occur. The palm *Archontophoenix cunninghamiana* is characteristic of the subcanopy, sometimes with *Sloanea*

australis. Climbers are prominent and include *Trophis scandens, Austrosteenisia glabristyla, Gynochthodes jasminoides, Palmeria racemosa, Cissus sterculiifolia, Calamus muelleri, Callerya megasperma, Carronia multisepalea, Cephalaralia cephalobotrys, Melodinus australis,* and *Ripogonum elseyanum.* The lower tree layer 10-15 m tall frequently consists of *Niemeyera chartacea, Syzygium oleosum, Synoum glandulosum, Mischarytera lautereriana, Mischocarpus pyriformis, Endiandra muelleri* subsp. *muelleri, Litsea leefeana,* and *Alangium villosum* subsp. *polyosmoides.* The open shrub layer is 2-5 m high and includes *Eupomatia laurina, Linospadix monostachyos, Cyathea leichhardtiana, Tasmannia insipida, Wilkiea huegeliana, Wilkiea macrophylla, Psychotria simmondsiana, Neolitsea dealbata* and at Kroombit and Bulburin, *Myrsine ireneae* subsp*. curvata.* A sparse to mid-dense ground layer of *Blechnum cartilagineum, Lastreopsis* spp*., Lomandra spicata, Alpinia arundelliana, Gymnostachys anceps, Calanthe triplicata,* and *Doodia aspera* is generally present.

Table 9 Five most extensive regional ecosystems included in BVG 4a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.11.1	Simple notophyll vine forest often with abundant *Archontophoenix cunninghamiana* (gully vine forest) on metamorphics +/- interbedded volcanics	14,339	11,536	78	NC
12.12.1	Simple notophyll vine forest usually with abundant *Archontophoenix cunninghamiana* (gully vine forest) on Mesozoic to Proterozoic igneous rocks	9,256	7,704	83	OC
7.3.10c	Mesophyll vine forest with scattered *Archontophoenix alexandrae* in the sub-canopy, of seasonally inundated alluvial plains	8,356	1,610	19	E
7.3.3a	Mesophyll vine forest with *Archontophoenix alexandrae*, on poorly drained alluvial plains	4,365	1,692	39	E
12.2.1	Notophyll vine forest on parabolic high dunes	3,761	3,754	100	OC

Regional ecosystems 12.11.1 and 12.12.1 form part of the *EPBC Act* critically endangered listed Lowland Rainforest of Subtropical Australia. Lowland Rainforest is defined as occurring in areas <300 m above sea level with high annual rainfall (>1300 mm).

Regional ecosystems 7.2.1d, g & h form part of the *EPBC Act* critically endangered listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

Photo 34 Notophyll feather palm vine forest, 12.2.1. Great Sandy NP (Cooloola Section), SEQ.
(WJF McDonald)

Photo 35 Simple notophyll vine forest, 12.12.1. Kroombit Tops, SEQ.
(VJ Neldner)

4b Evergreen to semi-deciduous mesophyll to notophyll vine forests, frequently with *Archontophoenix* spp., fringing streams

Pre-clearing area: 204’922 ha

Remnant 2017 area: 154,551 ha (75.4% of pre-clearing)

Bioregions: CYP (63%), SEQ (21%), WET (8%), CQC (7%), GUP (1%), BRB (1%)

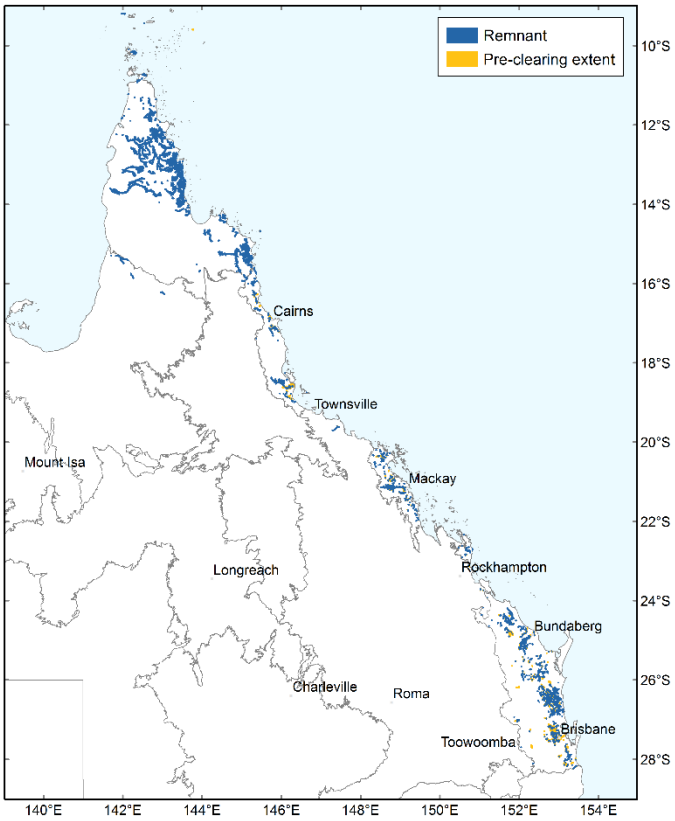
Land zones: 3 (99%), 10 (1%)

Mean annual rainfall range: > 1200 mm

Typical landforms: Banks and levees of major watercourses

Typical soils: Leptic Tenosols

Structural formation range: Evergreen notophyll to semi-deciduous mesophyll vine forest



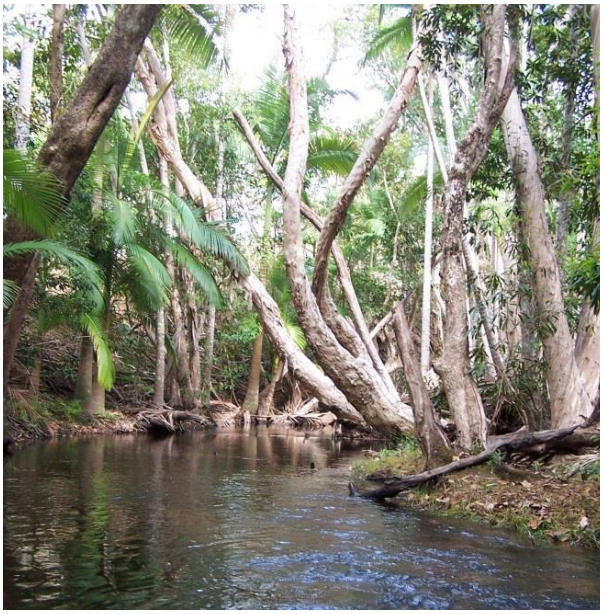


Photo 36 *Melaleuca leucadendra* dominated gallery forest, 3.3.5a. Peach Creek, ENE of Coen Airstrip, CYP.
(MR Newton)

Photo 37 *Syzygium forte* in evergreen notophyll vine forest, 3.3.5. Archer River, CYP.
(JR Clarkson)

Floristic characteristics (NQ): Emergent trees more than 28 m tall are sometimes present. Frequent species include *Melaleuca leucadendra, Alstonia scholaris, Terminalia sericocarpa, Eucalyptus tereticornis, Ficus* spp., *Acacia auriculiformis, A. polystachya, Elaeocarpus grandis* and *Bombax ceiba* var*. leiocarpum.* The dense canopy which is generally over 20 m tall is composed of the emergent species plus additional species such as *Buchanania arborescens, Castanospermum australe, Beilschmiedia obtusifolia, Archontophoenix* spp., *Argyrodendron polyandrum, Chionanthus ramiflorus, Cryptocarya hypospodia, Blepharocarya involucrigera, Cordia dichotoma, Dillenia alata, Miliusa horsfieldii, Syzygium tierneyanum, Aleurites moluccanus, Canarium australianum, Carallia brachiata, Lophostemon suaveolens, Mallotus polyadenos, Millettia pinnata, Myristica globosa, Semecarpus australiensis, Syzygium bamagense* and *Waterhousea floribunda.* Vines are relatively infrequent, and include *Flagellaria indica, Dioscorea transversa, Geitonoplesium cymosum, Cissus antarctica, Faradaya splendida, Gynochthodes jasminoides, Maclura cochinchinensis, Melodorum leichhardtii,* and *Trophis scandens.* The mid-dense subcanopy is composed of smaller individuals of the canopy species. Additional species found in the sparse shrub/ low tree layer include *Cleistanthus apodus, Glycosmis trifoliata, Mallotus philippensis, Atractocarpus fitzalanii, A. sessilis, Alyxia spicata, Arytera divaricata, Calophyllum sil, Ficus congesta, F. opposita, Leea indica, Streblus brunonianus, Barringtonia calyptrata, Cryptocarya triplinervis* var*. riparia, Diospyros geminata, Drypetes deplanchei* and *Lunasia amara.* Sparse forbs may occur in the ground layer and include *Pseuderanthemum variabile, Adiantum hispidulum, Christella dentata, Lomandra hystrix, Aneilema acuminatum* and *Oplismenus aemulus* (see Tracey 1982 1c).

Floristic characteristics (SEQ): Complex to simple notophyll vine forest. *Waterhousea floribunda* is predominant fringing stream channels. Frequent canopy species can include *Cryptocarya hypospodia, C. obovata, C. triplinervis, Argyrodendron trifoliolatum, Ficus coronata, F. fraseri, F. macrophylla* forma *macrophylla, Aphananthe philippinensis, Elaeocarpus grandis, Grevillea robusta, Castanospermum australe* and *Syzygium francisii.* Emergent trees may be present and include *Ficus racemosa* and *Nauclea orientalis* (in northern SEQ and CQC)*, Eucalyptus* spp. (e.g. *E. grandis)* and *Araucaria cunninghamii.*

Table 10 Five most extensive regional ecosystems included in BVG 4b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.5a	Evergreen notophyll vine forest on alluvia on major watercourses	71,764	71,701	100	NC
3.3.1a	Semi-deciduous notophyll vine forest on loamy alluvia	34,318	33,840	99	NC
12.3.1a	Complex notophyll vine forest on alluvial plains	15,533	4,408	28	E
7.3.23a	Simple-complex semi-deciduous notophyll to mesophyll vine forest, on lowland alluvium, predominantly riverine levees	15,310	3,459	23	E
12.3.16	Complex notophyll to microphyll vine forest on alluvial plains	13,759	3,387	25	E

The regional ecosystem 12.3.1 (which now includes 12.3.1a, 12.3.16 and 12.3.17) from this BVG forms part of the *EPBC Act* critically endangered listed Lowland Rainforest of Subtropical Australia.

Photo 38 Gallery rainforest (notophyll vine forest), 12.3.16. Stony Creek, SW of Agnes Water, SEQ.
(WJF McDonald)

Photo 39 Gallery rainforest (notophyll vine forest), 12.3.17. Munna Creek, west of Maryborough, SEQ.
(TS Ryan)

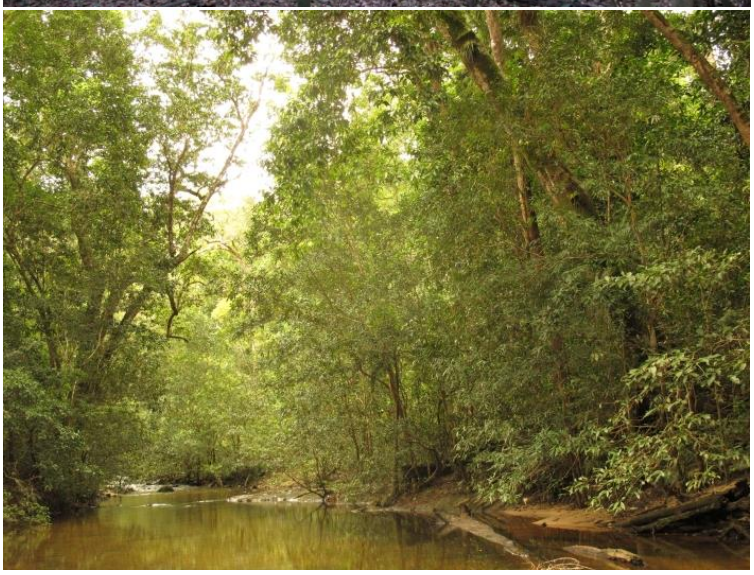


Photo 40 Closed semi-deciduous mesophyll vine forest on loamy alluvia, 3.3.1a. Claudie River, CYP.
(VJ Neldner)

5 Notophyll to microphyll vine forests, frequently with *Araucaria* spp. or *Agathis* spp. (kauri pines)

5a Araucarian notophyll/microphyll and microphyll vine forests of southern coastal bioregions

Pre-clearing area: 203,098 ha

Remnant 2017 area: 51,529 ha (25.4% of pre-clearing)

Bioregions: SEQ (99%), BRB (1%)

Land zones: 8 (37%), 11 (29%), 5 (22%), 9 (12%)

Mean annual rainfall range: 1000-2000 mm

Typical landforms: Hills and ranges of a variety of geological substrates; coastal lowland plains

Typical soils: Red Ferrosols and Red and Brown Dermosols

Structural formation range: Araucarian microphyll to notophyll vine forest

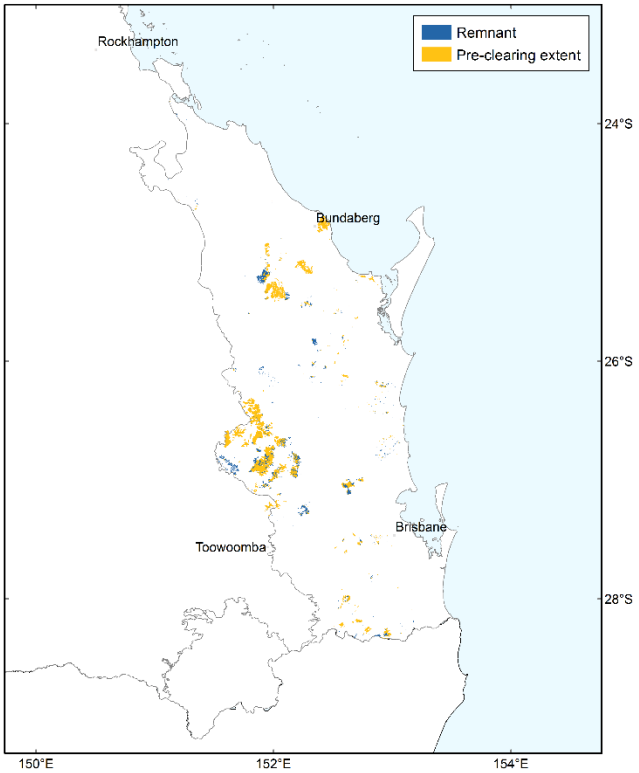


Photo 41 Araucarian complex microphyll vine forest, 12.11.12. Goodnight Scrub NP, SEQ. (WJF McDonald)

Photo 42 Microphyll to notophyll vine forest with *Araucaria cunninghamii*, 12.5.13a, near Murgon, SEQ. (TS Ryan)

Floristic characteristics: *Araucaria cunninghamii* is a frequent emergent tree and regularly grows to over 30 m tall. *Argyrodendron trifoliolatum, Flindersia australis, F. collina, Dendrocnide photinophylla, D. excelsa, Excoecaria dallachyana* and *Vitex lignum-vitae* are frequent trees in the dense canopy. *Cupaniopsis parvifolia, Alectryon connatus, Notelaea microcarpa, Denhamia pittosporoides, Dinosperma erythrococcum, Geijera salicifolia,*

Polyscias elegans and *Psydrax lamprophylla* may also occur in the canopy. Vines are frequent and include *Jasminum simplicifolium* subsp*. australiense, J. didymum* subsp*. racemosum, Trophis scandens, Melodorum leichhardtii, Austrosteenisia blackii, Tinospora smilacina* and *Cissus oblonga.* Additional species that may be in the mid-dense subcanopy include *Capparis arborea, C. sarmentosa, Planchonella cotinifolia, P. myrsinifolia, Arytera foveolata, Croton insularis, Gossia bidwillii, Drypetes deplanchei, Cupaniopsis parvifolia, Diospyros geminata, D. australis, Elattostachys xylocarpa, Alectryon connatus, Baloghia inophylla* and *Mallotus philippensis.* The mid-dense shrub/ low tree layer frequently contains the additional species of *Carissa ovata, Capparis arborea, Gossia bidwillii, Alyxia ruscifolia, Everistia vacciniifolia* var*. nervosa, Alchornea ilicifolia, Cleistanthus cunninghamii, Casearia multinervosa, Acalypha capillipes, Pittosporum viscidum, Arytera foveolata, Croton insularis, Exocarpos latifolius, Turraea pubescens* and *Alectryon subdentatus.* The ground layer is very sparse and includes *Harnieria hygrophiloides, Solanum corifolium, S. stelligerum* and *Pellaea paradoxa,* and the graminoids *Ancistrachne uncinulata, Cyperus gracilis* and *Oplismenus aemulus.*

Table 11 Five most extensive regional ecosystems included in BVG 5a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.8.13	Araucarian complex microphyll vine forest on Cainozoic igneous rocks	75,149	14,367	19	OC
12.5.13a	Microphyll to notophyll vine forest ± *Araucaria cunninghamii* on remnant Tertiary surfaces	43,373	5,043	12	E
12.11.11	Araucarian microphyll vine forest on metamorphics ± interbedded volcanics; usually southern half of bioregion	36,414	14,135	39	NC
12.9-10.16	Araucarian microphyll to notophyll vine forest on Cainozoic and Mesozoic sediments	23,560	8,591	36	E
12.11.12	Araucarian complex microphyll vine forest on metamorphics ± interbedded volcanics; usually northern half of bioregion	23,166	9,370	40	OC

The regional ecosystems 12.5.13 and 12.8.13 from this BVG form part of the *EPBC Act* critically endangered listed Lowland Rainforest of Subtropical Australia.

Photo 43 Araucarian microphyll vine forest on metamorphics +/- interbedded volcanics, 12.11.11. Bunderra Nature Refuge, SEQ.
(WJF McDonald)

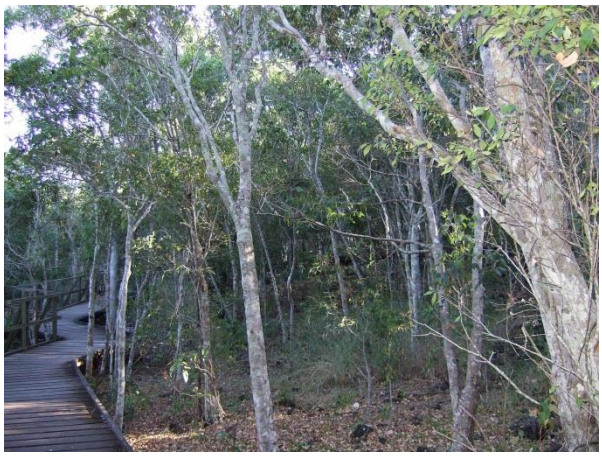


Photo 44 Notophyll vine forest, 12.8.13. Hummock boardwalk, east of Bundaberg, SEQ.
(TS Ryan)

5b Notophyll to microphyll vine forests, frequently with *Araucaria cunninghamii* (hoop pine), on ranges of central coastal bioregions

Pre-clearing area: 187,204 ha

Remnant 2017 area: 173,432 ha (92.6% of pre-clearing)

Bioregions: CQC (99%), WET (1%)

Land zones: 12 (97%), 11 (2%), 8 (1%)

Mean annual rainfall range: 1200-2000 mm

Typical landforms: Occurs on high mountain plateaus, slopes, ridges and crests on rolling mountains of foothills, uplands and highlands

Typical soils: Red Ferrosols and Red and Brown Dermosols

Structural formation range: Evergreen notophyll to semi-deciduous microphyll vine forest

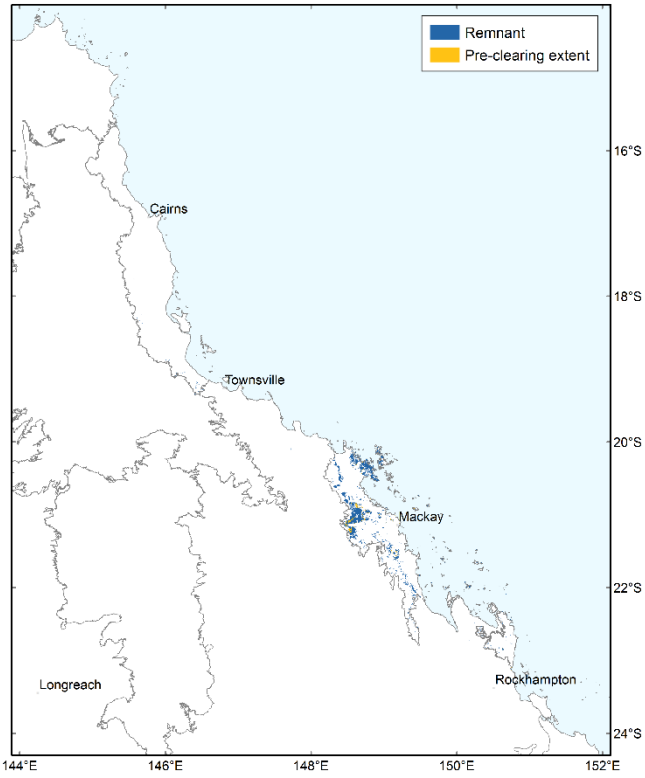


Photo 45 Notophyll vine forest, 8.12.2. Eungella NP, CQC. (JE Kemp)

Floristic characteristics: *Araucaria cunninghamii* is sometimes present as an emergent tree. The dense canopy is generally greater than 18 m tall with *Argyrodendron polyandrum, Falcataria toona, Dendrocnide photinophylla, Cryptocarya hypospodia, C. bidwillii, C. triplinervis, Diospyros hebecarpa, Pleiogynium timorense, Macropteranthes fitzalanii, Terminalia porphyrocarpa, Flindersia schottiana, Drypetes deplanchei, Euroschinus falcatus, Cleistanthus dallachyanus* and *Olea paniculata* often occurring. The lianas *Cissus oblonga, Austrosteenisia blackii, Smilax australis, Melodorum leichhardtii, Trophis scandens, Flagellaria indica* and *Tetrastigma nitens* are relatively frequent. The palm *Archontophoenix cunninghamiana* is sometimes present. Additional tree species that occur in the subcanopy

include *Aidia racemosa, Mallotus philippensis, Gossia bidwillii, Chionanthus ramiflora, Arytera divaricata, Acronychia laevis, Alangium villosum* subsp*. tomentosum, Aphananthe philippinensis, Harpullia pendula* and *Atalaya rigida.* The low tree/ shrub layer is sparse, and can include the additional species of *Lepiderema punctulata, Memecylon pauciflorum, Alyxia ruscifolia, Mischocarpus anodontus, Tabernaemontana orientalis, Fitzalania heteropetala, Atalaya rigida, Elattostachys xylocarpa, Elaeodendron melanocarpum, Psychotria daphnoides, Cupaniopsis wadsworthii* and *Eugenia reinwardtiana.* The sparse ground layer frequently contains ferns *Adiantum hispidulum, A. aethiopicum, Microsorum punctatum, Lastreopsis tenera* and *Drynaria sparsisora,* and graminoids *Dianella caerulea* var*. vannata, Gahnia aspera, Oplismenus aemulus, O. imbecillis* and *Gymnostachys anceps, Alpinia caerulea, Aneilema acuminatum* and *Scleria sphacelata.*

Table 12 Five most extensive regional ecosystems included in BVG 5b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
8.12.3a	Evergreen notophyll to microphyll vine forest, of foothills and uplands on Mesozoic to Proterozoic igneous rocks	61,830	57,428	93	NC
8.12.2	Evergreen notophyll to complex notophyll vine forest of uplands, highlands and foothills, on Mesozoic to Proterozoic igneous rocks	34,039	31,234	92	NC
8.12.18	Semi-evergreen notophyll/microphyll to complex notophyll *Argyrodendron* spp. vine forest +/- *Araucaria cunninghamii*, of foothills and uplands on near-coastal ranges and islands, on Mesozoic to Proterozoic igneous rocks	26,732	25,988	97	NC
8.12.1a	Evergreen notophyll feather palm vine forest, of uplands and highlands, on Mesozoic to Proterozoic igneous rocks (subregion 3)	21,850	18,429	84	NC
8.12.11a	Semi-evergreen microphyll vine thicket +/- *Araucaria cunninghamii*, on islands and coastal headlands, on Mesozoic to Proterozoic igneous rocks and Tertiary acid to intermediate volcanics (subregions 1-3)	14,740	14,665	99	OC

Photo 46 Notophyll vine forest with feather palms, 8.12.3a. Shoalwater Bay Training Area, CQC.

(JM Brushe)

Photo 47 Semi-evergreen notophyll/microphyll vine forest dominated by *Argyrodendron polyandrum* and *Backhousia citriodora*, 8.12.18. North of Whitsunday Great Walk, near Repulse Creek, CQC.

(WJF McDonald)

5c Simple to complex notophyll vine forests, often with *Agathis* spp. on ranges and uplands of the Wet Tropics bioregion

Pre-clearing area: 64,859 ha

Remnant 2017 area: 61,852 ha
(95.4% of pre-clearing)

Bioregions: WET (98%), EIU (2%)

Land zones: 12 (52%), 11 (46%), 8 (2%)

Mean annual rainfall range:
1600-3000 mm

Typical landforms: On foothills and uplands on metamorphic and granitic geologies

Typical soils: Red and Brown Dermosols, and Red Ferrosols

Structural formation range:
Complex notophyll to simple notophyll vine forest

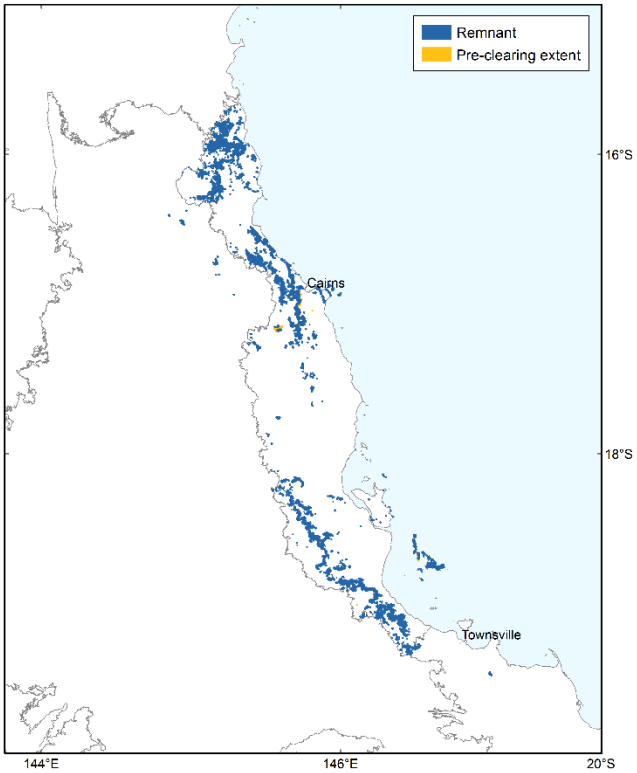


Photo 48 Simple notophyll vine forest, 7.12.7a. Downfall Creek, WET.
(AJ Ford, CSIRO)

Floristic characteristics: *Agathis robusta* is a frequent emergent tree to 35 m tall. The closed canopy frequently contains *Argyrodendron polyandrum, Falcataria toona, Aleurites moluccanus, Cryptocarya triplinervis, Ficus benjamina, Flindersia schottiana* var. *pubescens, Linociera ramiflora, Pleiogynium timorense* and *Polyalthia nitidissima.* The mid-dense subcanopy and low tree layer frequently includes *Gossia myrsinocarpa, Codiaeum variegatum,*

Elaeodendron melanocarpum, Euonymus australiana, Glycosmis pentaphylla, Mallotus philippensis, Denhamia bilocularis, Memecylon pauciflorum and *Myrsine porosa.* The palms *Ptychosperma elegans* and *Archontophoenix alexandrae* are frequent in the wetter areas. Lianas are frequent in the canopy and on the ground and include *Calamus caryotoides, Carronia protensa, Derris trifoliata, Austrosteenisia stipularis, Hippocratea barbata, Parsonsia velutina, Pachygone ovata* and *Trophis scandens.* Scattered ferns *Adiantum hispidulum, Doodia caudata* and *Taenitis pinnata* may be present in the ground layer. (see Tracey 1982 6)

Table 13 Five most extensive regional ecosystems included in BVG 5c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.11.7a	Complex notophyll vine forests (with emergent *Agathis robusta*) on metamorphic foothills and uplands of areas excluding the Seaview Range Subregion	27,724	25,595	92	NC
7.12.7a	Complex notophyll vine forests (with emergent *Agathis robusta*), on foothills and uplands on granite and rhyolite north of the Herbert River	14,922	14,293	96	NC
7.12.11a	Complex notophyll vine forests south of the Herbert River, on foothills and uplands on granite and rhyolite	12,885	12,879	100	OC
7.12.11b	Simple notophyll vine forest of rocky areas and unstable talus on granite and rhyolite	2,502	2,497	100	OC
7.12.11c	Notophyll semi-evergreen vine forest of foothills and uplands on granite and rhyolite	1,808	1,802	100	OC

The regional ecosystem 7.12.11d from this BVG forms part of the *EPBC Act* critically endangered listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

Photo 49 Simple notophyll vine forest, 7.12.7a. Hunter Creek, WET.
(AJ Ford, CSIRO)

Photo 50 Simple notophyll vine forest, 7.12.11b. Bullocky Tom's Creek, WET.
(AJ Ford, CSIRO)

5d *Acacia celsa* / *A. mangium* (brown sandalwood) / *A. polystachya* closed forests to open forests with mixed rainforest species understorey includes areas regenerating after disturbance (upland and lowland areas)

Pre-clearing area: 162,051 ha

Remnant 2017 area: 165,886 ha (102% of pre-clearing)

Bioregions: CYP (88%), WET (12%)

Land zones: 12 (81%), 11(17%), 8 (2%), 3 (1%)

Mean annual rainfall range: >1600 mm

Typical landforms: (1) on metamorphic and granitic plateaus and slopes on Cape York Peninsula; (2) exposed metamorphic and granitic slopes, frequently damaged by cyclones

Typical soils: Red and Brown Dermosols

Structural formation range: Simple evergreen notophyll vine forest.

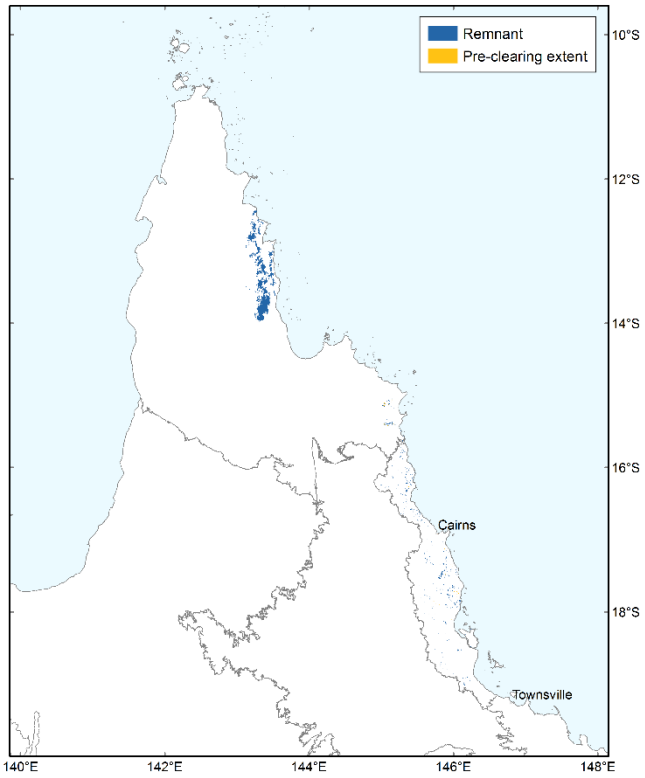


Photo 51 Simple evergeen notophyll vine forest, 3.12.3a. McIllwraith Range, CYP.
(VJ Neldner)

Photo 52 Notophyll vine forest on granitic slopes, 3.12.3b. Chester Gorge, CYP.
(JR Clarkson)

Floristic characteristics: (CYP) The dense canopy averages 23 m in height and frequently includes *Acacia polystachya, A. midgleyi, Argyrodendron polyandrum, Buchanania arborescens, Grevillea baileyana, Cryptocarya vulgaris, C. cunninghamii, Aleurites moluccanus, Alstonia scholaris, Canarium australianum, Terminalia sericocarpa, Blepharocarya involucrigera, Cordia dichotoma, Garuga floribunda, Litsea fawcettiana, Mallotus polyadenos, Maniltoa lenticellata, Miliusa horsfieldii* and *Semecarpus australiensis.* The subcanopy is usually sparse and averages 14 m in height, and includes the additional tree species *Tetracera nordtiana, Dysoxylum acutangulum* subsp*. foveolatum, Strychnos minor, Acronychia acronychioides, Coelospermum decipiens, Diospyros fasciculosa, Endiandra glauca, Gossia floribunda* and *Maniltoa lenticellata.* Frequently occurring vines include

Calamus caryotoides, C. australis, Flagellaria indica and *Smilax australis.* Additional species that occur in the very sparse shrub/ low tree layer include *Atractocarpus sessilis, Tabernaemontana orientalis, Cleistanthus hylandii, Diploglottis macrantha, Wilkiea rigidifolia, Cryptocarya exfoliata, Cupaniopsis flagelliformis, Diospyros hebecarpa, Drypetes deplanchei, Euonymus australiana, Ixora timorensis, Mallotus philippensis, Planchonella chartacea* and *Streblus brunonianus.* The ground layer is very sparse with occasional gingers *Cordyline cannifolia* and *Alpinia caerulea,* and ferns *Taenitis pinnata* and *Adiantum aethiopicum* being present.

Floristic characteristics: (wind disturbed WET and CYP) The dense canopy is between 15 and 30 m tall and may be dominated solely by *Acacia celsa* (upland areas), or *A. celsa* in combination with *A. cincinnata, A. polystachya, A. mangium* (foothills and lowlands) or *A. melanoxylon* (higher altitudes). The vine forest understorey is usually 5-10 m below the canopy and includes a number of species that have been described by Tracey (1982) Types 12a, b, c, & d.

Table 14 Five most extensive regional ecosystems included in BVG 5d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.12.3a	Simple evergreen notophyll vine forest on exposed and granitic slopes	73,369	73,369	100	NC
3.12.3b	Notophyll vine forest on granitic slopes and plateaus	48,611	48,611	100	NC
3.11.3	Simple evergreen notophyll vine forest on exposed metamorphic and granitic slopes	18,023	17,902	99	NC
7.12.9	*Acacia celsa* open forest to closed forest, on granites and rhyolites	4,849	4,805	99	OC
7.11.24c	Areas of mesophyll to notophyll vine forest suffering from extreme wind damage where at least half the canopy has been destroyed, on foothills of coastal metamorphic ranges (excluding amphibolite), often steep and exposed	4,307	4,405	102	OC

Photo 53 Simple evergreen notophyll vine forest, 3.11.3. Iron Range, CYP.
(VJ Neldner)

Photo 54 Closed vineland of cyclone-disturbed vine forest, 7.12.40a. Near Babinda, WET.
(VJ Neldner)

6 Notophyll vine forest and microphyll fern forests to thickets on high peaks and plateaus

6a Notophyll vine forests and microphyll fern forests to thickets on high peaks and plateaus of southern Queensland

Pre-clearing area: 23,691 ha

Remnant 2017 area: 19,945 ha (84.2% of pre-clearing)

Bioregions: SEQ (100%)

Land zones: 8 (100%)

Mean annual rainfall range: 1200-2400 mm

Typical landforms: Plateaus and ranges greater than 600 m altitude

Typical soils: Red Ferrosols

Structural formation range: Complex notophyll vine forest to microphyll fern forest to thicket

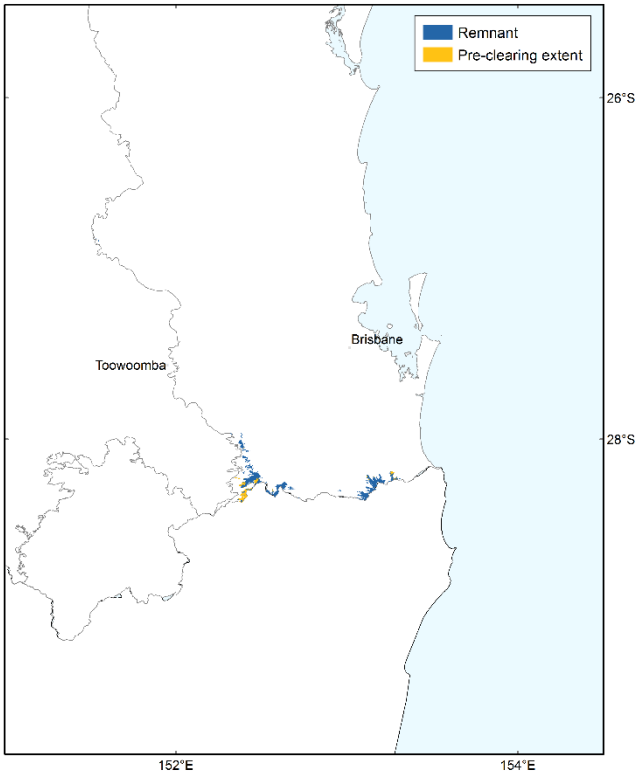


Photo 55 Complex notophyll vine forest on Cainozoic igneous rocks, 12.8.5. Goomburra section, Main Range NP, SEQ.
(WJF McDonald)

Floristic characteristics: Common canopy species include *Argyrodendron actinophyllum, Sloanea woollsii, Cryptocarya erythroxylon, Ficus watkinsiana, Dysoxylum fraserianum, Caldcluvia paniculosa, Karrabina benthamiana, Doryphora sassafras, Orites excelsus, Acmena ingens, Syzygium crebrinerve* and *Citronella moorei*. *Caldcluvia paniculosa, Nothofagus moorei, Ceratopetalum apetalum, Acmena smithii, Quintinia* spp., *Doryphora sassafras* and *Orites excelsus* often dominate at higher altitudes and the structure is a simple microphyll fern forest/ thicket. In this situation, there is a profusion of mosses, ferns and other epiphytes, (i.e.: *Dendrobium falcorostrum*).

The low tree/ shrub layer includes *Callicoma serratifolia, Cordyline stricta, Myrsine howittiana, Pittosporum oreillyanum* and *Tasmannia insipida*. Frequent vines *include Cephalaralia cephalobotrys, Hibbertia scandens, Marsdenia rostrata, Pandorea baileyana, Parsonsia induplicata, Ripogonum discolor* and *Smilax australis*. The ferns *Asplenium australasicum, Blechnum cartilagineum, Calochlaena dubia, Cyathea australis, Histiopteris incisa, Lastreopsis decomposita and Microsorum pustulatum,* together with *Lomandra spicata and Dianella caerulea*, form a mid-dense ground cover. Most of the bark of the trees and vines are covered with lichens and mosses.

Table 15 The four regional ecosystems included in BVG 6a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.8.5	Complex notophyll vine forest on Cainozoic igneous rocks. Altitude usually >600m	21,669	17,932	83	NC
12.8.7	Simple microphyll fern thicket with *Acmena smithii* on Cainozoic igneous rocks	998	993	99	OC
12.8.6	Simple microphyll fern forest with *Nothofagus moorei* on Cainozoic igneous rocks	758	755	100	OC
12.8.18	Simple notophyll vine forest with *Ceratopetalum apetalum* on Cainozoic igneous rocks	267	265	100	OC

Photo 56 Simple microphyll fern forest with *Nothofagus moorei* on Cainozoic igneous rocks, 12.8.6. Bethongabel, Lamington NP, SEQ. (WJF McDonald)

Photo 57 Simple microphyll fern forest with *Nothofagus moorei*, 12.8.6. Best of All Lookout, Springbrook ,SEQ.
(VJ Neldner)

Photo 58 Simple notophyll vine forest with *Ceratopetalum apetalum* on Cainozoic igneous rocks, 12.8.18. Daves Creek Circuit, Lamington NP, SEQ.
(WJF McDonald)

6b Simple evergreen notophyll vine forests to simple microphyll vine fern thickets on high peaks and plateaus of northern Queensland

Pre-clearing area: 319,256 ha

Remnant 2017 area: 300,918 ha (94.3% of pre-clearing)

Bioregions: WET (97%), CQC (2%), BRB (1%)

Land zones: 12 (89%), 11 (11%)

Mean annual rainfall range: 2400-8000 mm

Typical landforms: Predominantly granitic and rhyolitic ranges and tablelands, although metamorphosed sediments and quartzites also locally significant

Typical soils: Yellow Kandosols and Semiaquic Podsols

Structural formation range: Simple notophyll vine forest to simple microphyll vine-fern thicket

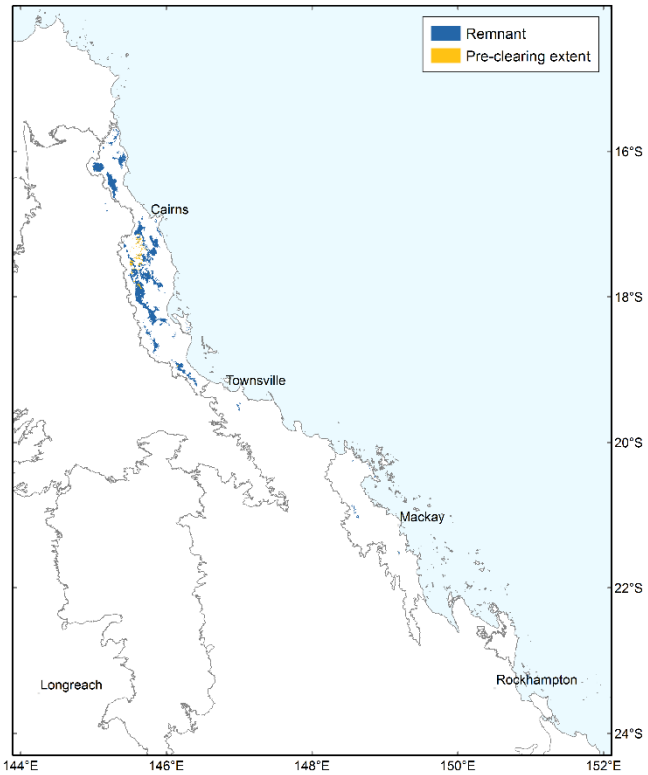


Photo 59 Mesophyll vine forest, 7.12.16a. Bellenden Ker Range, WET. (AJ Ford, CSIRO)

Floristic characteristics (WET 400-1000 m altitude): This simple notophyll vine forest has a canopy is generally even, dense and 24-33 m tall. Common species include *Acmena resa, Balanops australiana, Beilschmiedia collina, B. recurva, Caldcluvia australiensis, Canarium australasicum, Cardwellia sublimis, Ceratopetalum succirubrum, Cryptocarya angulata, C. corrugata, C. densiflora, C. grandis, C. oblata, Doryphora aromatica, Elaeocarpus largiflorens, E. foveolatus, Endiandra dielsiana, E. monothyra, E. palmerstonii, Flindersia bourjotiana, F.*

pimenteliana, Franciscodendron laurifolium, Garcinia zichii, Halfordia kendack, Placospermum coriaceum, Planchonella euphlebia, Pleioluma papyracea, Rhodamnia blairiana, Sloanea spp., *Sphenostemon lobosporus, Synoum glandulosum* subsp. *paniculosum, Syzygium endophloium, S. johnsonii, S. papyraceum, S. wesa* and *Xanthophyllum octandrum*. The sub-canopy includes the species *Apodytes brachystylis, Brackenridgea australiana, Bobea myrtoides, Bubbia semecarpoides, Casearia costulata, Chionanthus axillaris, Cryptocarya lividula, Gossia shepherdii, Harpullia rhyticarpa, Lethedon setosum, Medicosma fareana, Niemeyera prunifera, Polyosma hirsuta, Polyscias australiana, P. purpurea, Rockinghamia angustifolia, Steganthera macooraia* and *Symplocos glabra.* A dense to sparse shrub layer frequently contains *Ardisia brevipedata, A. hylandii, Hedraianthera porphyropetala, Psychotria* spp., *Pilidiostigma tetramerum* and *Wilkiea angustifolia.* Liana and epiphytes are frequent. *Cordyline cannifolia, Linospadix* spp., the ferns *Blechnum cartilagineum* and *Lastreopsis* spp. the graminoids *Exocarya scleroides* and *Lomandra longifolia* and the tree fern *Cyathea rebeccae* are prominent in the ground layer (Tracey 1982 type 8).

Floristic characteristics (WET 800-1300 m altitude): A simple microphyll vine fern forest usually occurs (Tracey 1982 Type 9), sometimes down to 600 m. The canopy is even but only 20-25 metres tall, with patches of emergent *Agathis atropurpurea* in places (at higher elevations). Frequent canopy species include *Balanops australiana, Caldcluvia australiensis, Ceratopetalum* spp*., Elaeocarpus ferruginiflorus, E. foveolatus, E. largiflorens, E. sericopetalus, Flindersia acuminata, F. pimenteliana, Garcinia zichii, Halfordia kendack, Orites fragrans, Pleioluma macrocarpa, Psydrax montigena, Pullea stutzeri, Sphalmium racemosum, Syzygium apodophyllum, S. endophloium, S. johnsonii* and *S. wesa*. The sub-canopy tends to be dense and contains *Ardisia pachyrrhachis, Bubbia* spp., *Crispiloba disperma, Chionanthus axillaris, Helicia recurva, Linospadix* spp., *Laccospadix australasicus, Oraniopsis appendiculata, Pittosporum rubiginosum, Polyosma rigidiuscula, Psychotria* spp., *Schistocarpaea johnsonii, Symplocos* spp. and *Wilkiea* spp. Large lianas are rare, although wiry vines are frequent, as are epiphytes. The ground layer includes *Blechnum patersonii, Bolbitis quoyana, Cyathea rebeccae, Oenotrichia tripinnata* and *Pteridoblechnum neglectum.*

Floristic characteristics (WET above 1300 m altitude): A simple microphyll vine fern thicket occurs with the dense canopy only 10-12 m tall, and wind-sheared emergent *Leptospermum wooroonooran* to 15 m tall (Tracey 1982 Type 10). Frequent canopy species include *Acmena hemilampra* subsp. *orophila, Acronychia chooreechillum, Balanops australiana, Uromyrtus metrosideros, Cinnamomum propinquum, Cryptocarya bellendenkerana, Elaeocarpus ferruginiflorus, E. hylobroma, Garcinia brassii, Myrsine oreophila, Syzygium apodophyllum, Flindersia oppositifolia, Halfordia kendack, Orites fragrans, Pleioluma singuliflora, Rhodomyrtus sericea* and *Trochocarpa bellendenkerensis*. The subcanopy to 3 m high tends to be dense and contains *Alyxia orophila, Crispiloba disperma, Chionanthus axillaris, Dracophyllum sayeri, Hypsophila* spp., *Laccospadix australasicus, Linospadix* spp., *Oraniopsis appendiculata, Pittosporum rubiginosum, Polyosma rigidiuscula, Psychotria* spp. and *Tasmannia membranea* and the tree fern *Cyathea rebeccae* is very common. Lianas are relatively sparse, but wiry vines can be common especially *Smilax glyciphylla* and *Morinda* spp., and epiphytes occur both on tree trunks and rocks. *Dianella caerulea, Lomandra hystrix, Calanthe triplicate, Helmholtzia acorifolia* and a variety of ferns and mosses form a dense to sparse ground layer.

An outlier of simple notophyll vine forest (7.12.16a) occurs above 800 m on Mt Elliot in the Brigalow Belt bioregion. In the Central Queensland Coast bioregion, evergreen microphyll mossy vine forests dominated by *Argyrodendron* spp. and *Cryptocarya* spp. (8.12.17) occur above 800m mainly in the Eungella National Park, and simple notophyll vine forests dominated by *Ristantia waterhousei* occur above 600m on Mt Dryander.

Table 16 The five regional ecosystems included in BVG 6b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.12.16a	Simple notophyll vine forest (often with *Agathis microstachya*), on uplands, granite and rhyolite	241,297	228,970	95	NC
7.11.12a	Simple notophyll vine forest of cloudy wet and moist uplands on metamorphics	35,207	29,403	84	NC
7.12.19a	Simple microphyll vine-fern forest (often with *Agathis atropurpurea*), on granite and rhyolite highlands of northern parts of the Bellenden Ker subregion and north	13,055	13,054	100	NC
7.12.50	Simple microphyll vine-fern forest of highlands on granite and rhyolite	7,473	7,471	100	OC
7.12.48	Wind-sheared notophyll vine forest on exposed granite and rhyolite ridge crests and steep slopes	6,893	6,890	100	OC

Photo 60 Wind-sheared microphyll vine forest, 7.12.20. Mount Lewis, WET.
(S Goosem)

Photo 61 Simple notophyll vine forest, 7.12.16a, Longlands Gap, WET.
(AJ Ford, CSIRO)

Photo 62 Simple microphyll vine-fern thicket, 7.12.20. Bellenden Ker, WET.
(AJ Ford, CSIRO)

7 Semi-evergreen to deciduous microphyll vine thickets

7a Semi-evergreen vine thickets on wide range of substrates

Pre-clearing area: 955,416 ha

Remnant 2017 area: 376,686 ha (39.4% of pre-clearing)

Bioregions: BRB (75%), EIU (15%), SEQ (9%), CQC (1%)

Land zones: 8 (29%), 9 (23%), 11 (16%), 12 (15%), 5 (6%), 9-10 (4%), 4 (3%), 3 (2%), 10 (2%)

Mean annual rainfall range: 800-1200 mm

Typical landforms: Crests and slopes of low hills on igneous and metamorphic rocks

Typical soils: Red Kandosols, Red and Yellow Dermosols and Red Ferrosols

Structural formation range: Semi-evergreen vine thicket to microphyll vine forest

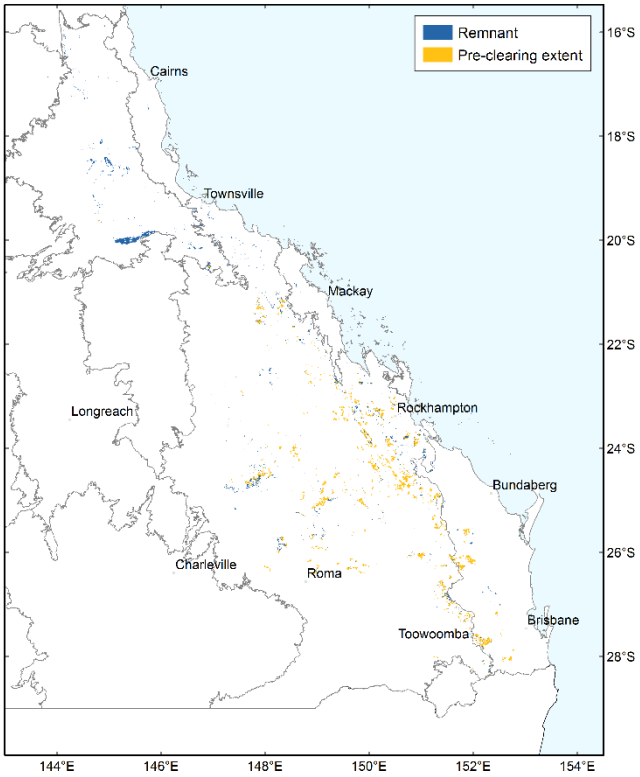


Photo 63 Semi-evergreen microphyll vine forest on igneous rocks, 11.12.4. Grevillea SF, BRB.
(WJF McDonald)

Photo 64 Semi-evergreen vine thicket, 9.11.8a. Chillagoe, EIU.
(AJ Ford, CSIRO)

Floristic characteristics: Emergent trees to 20 m tall include *Ailanthus triphysa, Brachychiton rupestris, B. australis*, *Gyrocarpus americanus* and sometimes *Ficus rubiginosa, F. virens* and *Araucaria cunninghamii*. The dense canopy which is rarely more than 10 m tall frequently includes *Acacia fasciculifera, Planchonella cotinifolia, Brachychiton* spp., *Notelaea microcarpa, Coatesia paniculata, Dinosperma erythrococcum, Backhousia angustifolia, Bridelia leichhardtii, Canarium australianum, Drypetes deplanchei, Ehretia membranifolia, Grevillea helmsiae, Croton insularis, Flindersia australis, Alstonia constricta, Geijera salicifolia, Diospyros humilis, Gossia bidwillii, Lysiphyllum* spp., *Strychnos lucida, S. psilosperma* and *Owenia venosa.*

Macropteranthes leichhardtii may dominate the canopy in some communities. *Cissus oblonga, Cissus reniformis, Glossocarya hemiderma, Secamone elliptica, Melodorum leichhardtii, Jasminum simplicifolium* subsp*. australiense, Tinospora smilacina, Clematicissus opaca*, *Cayratia trifolia* and *C. acris* are frequent deciduous and evergreen vines. Additional species occurring in the mid-dense shrub/ low tree layer include *Carissa ovata, Acalypha eremorum, Pittosporum spinescens, Alyxia ruscifolia, Glossocarya hemiderma, Turraea pubescens, Alectryon diversifolius, Capparis loranthifolia, Eugenia reinwardtiana, Flueggea leucopyrus, Croton phebalioides, C. acronychioides, Murraya ovatifoliolata*, *Coatesia paniculata, Erythroxylum* spp., *Everistia* spp., *Exocarpos latifolius* and *Psydrax odorata.* The sparse ground layer includes the graminoids *Ancistrachne uncinulata, Cyperus gracilis*, *Oplismenus aemulus, Aristida gracilipes* and *Dinebra decipiens,* and forbs *Pseuderanthemum variabile, Solanum stelligerum, Abutilon oxycarpum* var*. oxycarpum*, *Achyranthes aspera* and *Nyssanthes diffusa* (includes Tracey 1982 type 11).

Table 17 The five regional ecosystems included in BVG 7a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.9.4a	Semi-evergreen vine thicket that occur on crests and slopes of low hills and mountains	182,619	32,922	18	E
11.12.4	Semi-evergreen vine thicket and microphyll vine forest on igneous rocks	96,736	54,811	57	NC
9.8.7	Semi-evergreen vine thicket on cones, craters and rocky basalt flows with little soil development	86,624	86,609	100	OC
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks	80,539	25,046	32	OC
11.11.5	Microphyll vine forest ± *Araucaria cunninghamii* on old sedimentary rocks with varying degrees of metamorphism and folding	65,530	26,741	41	NC

The regional ecosystems 11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8 and 11.11.18 and from this BVG form the *EPBC Act* endangered listed Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions. The regional ecosystem 7.11.3b from this BVG forms part of the *EPBC Act* critically endangered listed Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

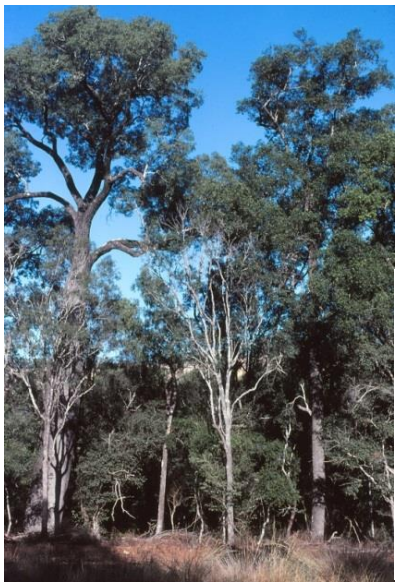


Photo 65 Semi-evergreen vine thicket with emergent *Brachychiton rupestris* and *Cadellia pentastylis*, 11.10.8. Carnarvon, BRB.
(VJ Neldner)

Photo 66 *Macropteranthes leichhardtii* thicket on fine-grained sedimentary rocks, 11.9.8. Expedition Range SF, BRB.
(WJF McDonald)

7b Deciduous microphyll vine thickets on ranges and heavy clay alluvia in northern bioregions

Pre-clearing area: 67,087 ha

Remnant 2017 area: 66,905 ha (99.7% of pre-clearing)

Bioregions: CYP (99.4%), WET (0.3%)

Land zones: 3 (46%), 12 (37%), 11 (8%), 10 (7%), 7 (3%)

Mean annual rainfall range: 1200-2000 mm

Typical landforms: (1) Near drainage lines on central CYP clay plains; (2) Rocky granitic, metamorphic and sandstone ranges

Typical soils: (1) Yellow and Brown Dermosols, with some areas of Brown or Grey Vertosols and Dermosolic Oxyaquic Hydrosols. (2) Orthic or Bleached-leptic Tenosols, sometimes Brown Dermosols or Yellow Kandosols

Structural formation range: Deciduous microphyll vine thicket to semi-deciduous notophyll/microphyll vine thicket

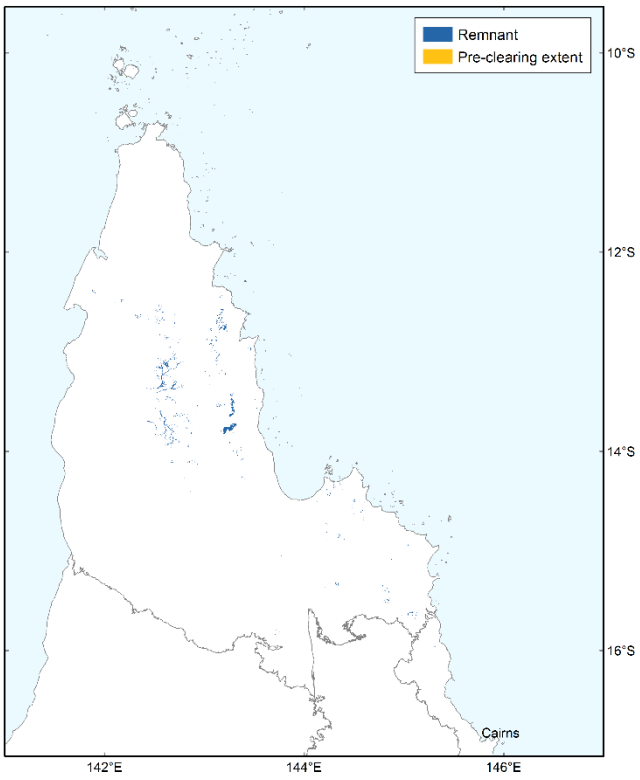


Photo 67 Deciduous notophyll / microphyll vine thicket with emergent *Lagerstroemia archeriana* and, *Eucalyptus microtheca*, 3.3.38a.

Archer Bend NP, near the Archer and Coen Rivers junction, CYP.

(VJ Neldner)

Floristic characteristics (CYP alluvial clays): The uneven canopy (5-10 m, rarely to 18 m tall) is composed of a variety of deciduous species. *Lagerstroemia archeriana, Strychnos lucida*, *Diospyros hebecarpa*, *Croton arnhemicus*, *Larsenaikia ochreata* and *Memecylon pauciflorum* frequently occur at high densities. *Lagerstroemia archeriana* and *Bombax ceiba* var. *leiocarpum* are frequently present as emergent trees up to 25 m tall. *Eucalyptus microtheca* is a frequent emergent tree along the drainage lines. A mid-dense subcanopy layer

is sometimes present. *Ixora timorensis, Gardenia scabrella*, *Strychnos lucida* and *Cleistanthus apodus* usually dominate the sparse to mid-dense shrub layer (0.5-6 m tall). Vines are frequent in both the shrub and tree layers. The ground layer is usually sparse, with *Abutilon auritum*, *Curcuma australasica* and *Oplismenus* spp. providing the greatest cover.

Floristic characteristics (CYP rocky slopes and ranges): The uneven canopy (5-12 m tall) is composed of a variety of species, most of which are deciduous in the dry season. *Cochlospermum gillivraei*, *Canarium australianum*, *Croton arnhemicus, Terminalia muelleri* and *Acacia polystachya* frequently dominate the mid-dense to dense canopy. *Gyrocarpus americanus* and *Bombax ceiba* var*. leiocarpum* are frequently present as part of the canopy, or as emergents (12-15 m tall). A sparse subcanopy layer (3-7 m tall) is sometimes present. The sparse to mid-dense shrub layer (0.5-6 m tall) is frequently composed of *Drypetes deplanchei, Eugenia reinwardtiana, Ziziphus oenopolia, Memecylon pauciflorum, Cryptocarya exfoliata, Diospyros compacta, Ixora timorensis, Miliusa traceyi, Tabernaemontana orientalis, Croton arnhemicus, Gardenia scabrella, Millettia pinnata* and *Strychnos lucida*. Vines are frequent in both the shrub and tree layers. The ground layer is usually sparse, with graminoids *Panicum trichoides, Scleria mackaviensis, Ancistrachne uncinulata* and *Oplismenus burmannii* making up the majority of the cover.

Table 18 Five most extensive regional ecosystems included in BVG 7b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.38a	Deciduous notophyll / microphyll vine thicket ± *Lagerstroemia archeriana* on clay alluvium	25,459	25,401	100	OC
3.12.21	Deciduous to semi-deciduous vine thicket to forest on igneous slopes	22,783	22,745	100	NC
3.11.21	Deciduous vine thicket on metamorphic slopes	5,126	5,125	100	NC
3.3.39	Semi-deciduous microphyll vine forest ± *Melaleuca* spp. associated with depressions	3,869	3,831	99	OC
3.10.5a	Deciduous notophyll/microphyll vine thicket ± *Gyrocarpus americanus* on sandstone hills	3,207	3,207	100	OC

Photo 68 Deciduous vine thicket, 3.12.21. Mubuiag Island, CYP.
(DG Fell)

Photo 69 Semi-deciduous microphyll vine forest with emergent *Melaleuca clarksonii, Asteromyrtus symphocarpa* and *M. viridiflora* in swamp, 3.3.39.
25 km south of Batavia Downs, CYP. (VJ Neldner)

8 Wet eucalypt tall open forests on uplands and alluvia

8a Wet tall open forests dominated by species such as *Eucalyptus grandis* (flooded gum) or *E. saligna*, *E. resinifera* (red mahogany), *Lophostemon confertus* (brush box), *Syncarpia* spp. (turpentine), *E. laevopinea* (silvertop stringybark)

Pre-clearing area: 248,472 ha

Remnant 2017 area: 191,268 ha (77.0% of pre-clearing)

Bioregions: SEQ (51%), WET (29%), BRB (19%), CQC (2%), NET (0.3%), EIU (0.1%)

Land zones: 12 (36%), 8 (18%), 10 (11%), 11 (10%), 3 (9%), 9-10 (7%), 5 (6%), 2 (4%)

Mean annual rainfall range: >1200 mm

Typical landforms: On uplands and highlands on a range of geologies; some on alluvial flats

Typical soils: Red Ferrosols and Dermosols

Structural formation range: Tall open forest to open forest, rarely woodlands

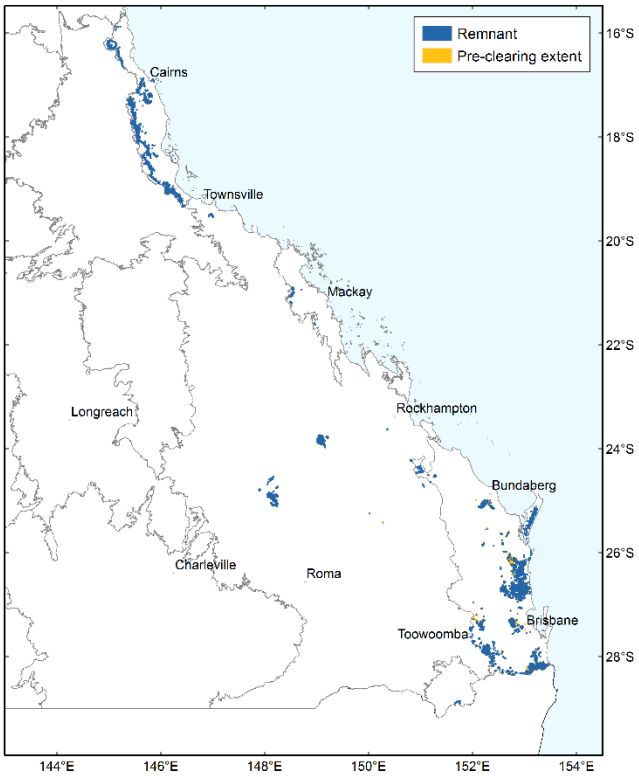


Photo 70 *Eucalyptus grandis* tall open forest, 12.11.2. Mt Tamborine, SEQ. (VJ Neldner)

Floristic characteristics: These tall (30-50 m) dense forests are generally dominated by *Eucalyptus grandis* or *E. saligna* or *E. resinifera, E. sphaerocarpa* or *Syncarpia glomulifera or S. hillii. Corymbia intermedia, Lophostemon confertus* and *Eucalyptus microcorys* may be present as canopy or subcanopy trees. *Allocasuarina torulosa* is often present in a subcanopy layer, while in some locations rainforest species such as *Cryptocarya glaucescens* and *Endiandra discolor* may be present. The shrub layer is sparse with *Alphitonia excelsa, Glochidion ferdinandi, Neolitsea dealbata, Notelaea punctata* and *Breynia oblongifolia* frequently occurring. The dense ground layer is usually dominated by the grasses *Themeda triandra, Ottochloa gracillima* or *Imperata cylindrica* or the ferns *Pteridium esculentum, Blechnum cartilagineum* and *Calochlaena dubia. Entolasia stricta, Oplismenus aemulus, O. imbecillis, Digitaria parviflora, Lepidosperma laterale, Ottochloa nodosa, Gahnia aspera,*

Microlaena stipoides and *Scleria sphacelata* are other frequent graminoids. Other frequent forbs are *Eustrephus latifolius, Dianella caerulea, Smilax australis, Desmodium rhytidophyllum, D. gunnii, Lomandra longifolia, Cissus hypoglauca, Geitonoplesium cymosum, Hardenbergia violacea, Dioscorea transversa* and *Cyanthillium cinereum.*

Table 19 Five most extensive regional ecosystems included in BVG 8a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.12.22a	*Eucalyptus resinifera, E. acmenoides, Corymbia intermedia, Syncarpia glomulifera* tall open forest on uplands and highlands	28,984	28,176	97	E
11.10.5	*Eucalyptus sphaerocarpa* ±*E. mensalis, E. saligna*, tall open forest	26,881	26,863	100	NC
12.3.2	*Eucalyptus grandis* tall open forest on alluvial plains	21,667	7,387	34	OC
12.11.2	*Eucalyptus saligna* or *E. grandis, E. microcorys*, *Lophostemon confertus* tall open forest	19,968	14,129	71	NC
11.8.1	*Eucalyptus laevopinea* tall open forest on Cainozoic igneous rocks. Elevated plateaus	15,783	15,782	100	NC

Photo 71 *Syncarpia hillii, Lophostemon confertus* tall open to closed forest on parabolic high dunes, 12.2.4. Central Station, Fraser Island, SEQ.
(VJ Neldner)

Photo 72 *Eucalyptus sphaerocarpa* tall open forest, 11.10.5 Blackdown Tableland NP, BRB.
(D Hopkins, QPWS)

Photo 73 *Eucalyptus grandis* open forest of wet uplands, 8.12.4. Eungella, CQC.
(JE Kemp)

Photo 74 *Eucalyptus resinifera, Syncarpia glomulifera* tall open forest, 7.12.22a, Tumoulin SF, WET.
(E Collins, QPWS)

8b Moist open forests to tall open forests mostly dominated by *Eucalyptus pilularis* (blackbutt) on coastal sands, sub-coastal sandstones and basalt ranges. Also includes tall open forests dominated by *E. montivaga, E. obliqua* (messmate stringybark), and *E. campanulata* (New England ash)

Pre-clearing area: 154,773 ha

Remnant 2017 area: 94,127 ha (60.8% of pre-clearing)

Bioregions: SEQ (98.5%), CQC (1.4%), BRB (0.1%)

Land zones: 12 (30%), 9-10 (19%), 11 (18%), 2 (14%), 5 (10%), 8 (8%)

Mean annual rainfall range: >1000 mm

Typical landforms: Coastal hills and ranges on a variety of substrates; also on parabolic dunes

Typical soils: Aeric Podosols, Red and Brown Dermosols, Red Ferrosols

Structural formation range:
Tall open forest to open forest, rarely woodlands

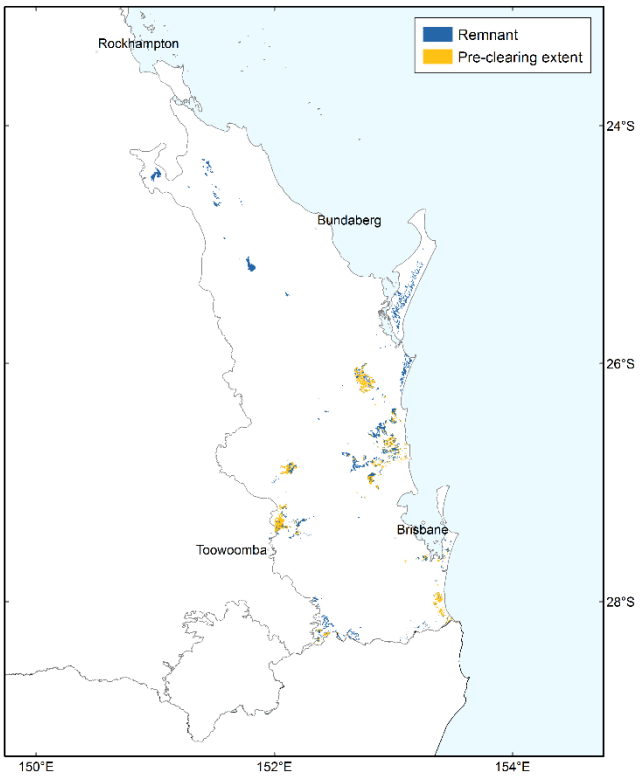


Photo 75 *Eucalyptus pilularis* open forest, 12.2.8. Fraser Island, SEQ.
(VJ Neldner)

Floristic characteristics: *Eucalyptus pilularis* is the main dominant tree that defines this BVG. Closely related *E. montivaga* and *E. campanulata* also dominate open forests. *E. cloeziana* and *E. obliqua* also can dominate smaller areas in this BVG. The canopy trees can reach up to 50 m tall. *Corymbia intermedia, E. microcorys, E. acmenoides* and *E. racemosa* are often

present as sub-dominant trees. *Allocasuarina torulosa* and *Lophostemon confertus* are often present in subcanopy tree layer. Additional species that may occur in the shrub / low tree layer are *Monotoca* sp. (Fraser Island P.Baxter 777), *Acacia disparrima, A. maidenii, Alphitonia excelsa* and *Breynia oblongifolia.* The ground layer is frequently dominated by the grasses *Imperata cylindrica, Themeda triandra* or *Ottochloa nodosa* or the ferns *Calochlaena dubia* and *Blechnum cartilagineum.* Other frequent graminoids are *Entolasia stricta, Lepidosperma laterale, Digitaria parviflora, Panicum effusum, Cymbopogon refractus* and *Oplismenus aemulus.* Additional frequent forbs are *Pteridium esculentum, Dianella caerulea, Eustrephus latifolius, Lomandra longifolia, Desmodium rhytidophyllum, Cyanthillium cinereum, Hardenbergia violacea, Goodenia rotundifolia, Desmodium gunnii* and *Smilax australis.*

Table 20 Five most extensive regional ecosystems included in BVG 8b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.12.2	*Eucalyptus pilularis* tall open forest on Mesozoic to Proterozoic igneous rocks especially granite	32,623	21,821	67	NC
12.2.8	*Eucalyptus pilularis* open forest on parabolic high dunes	22,380	21,575	96	NC
12.9-10.14	*Eucalyptus pilularis* tall open forest on sedimentary rocks	20,316	8,564	42	NC
12.11.16	*Eucalyptus cloeziana* open forest on metamorphics ± interbedded volcanics	17,913	3,976	22	E
12.5.6c	*Eucalyptus pilularis* open forest on remnant Tertiary surfaces. Usually deep red soils	16,088	5,646	35	E

Photo 76 *Eucalyptus pilularis* tall open forest, 12.12.2. Mapleton NP, SEQ.
(RE Niehus)

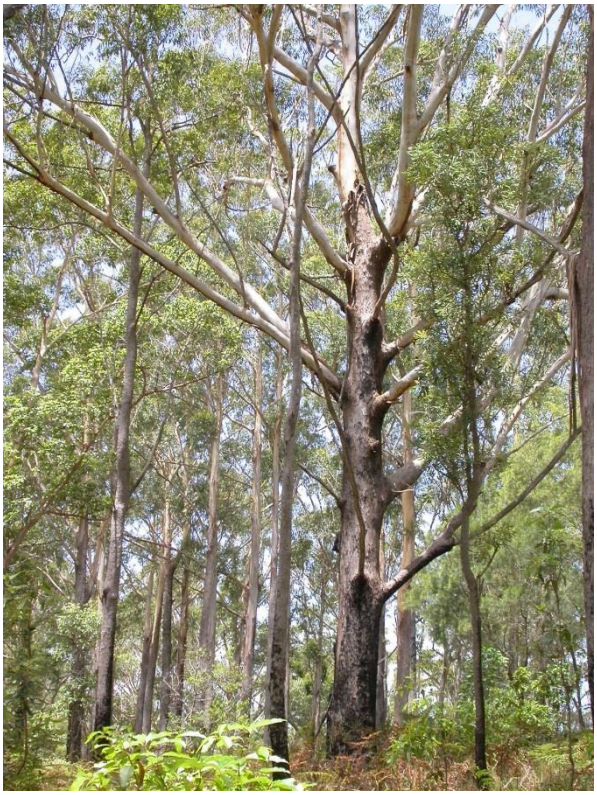


Photo 77 *Eucalyptus pilularis* tall open forest, 12.9-10.14. Tewantin National Park, SEQ.
(R Thomas)

9 Moist to dry eucalypt open forests to woodlands usually on coastal lowlands and ranges

9a Moist eucalypt open forests to woodlands dominated by a variety of species including *Eucalyptus siderophloia* (red ironbark), *E. propinqua* (small-fruited grey gum), *E. acmenoides* (narrow-leaved white stringybark), *E. microcorys* (tallowwood), *E. carnea* (broad-leaved white mahogany), *E. tindaliae* (Queensland white stringybark), *Corymbia intermedia* (pink bloodwood), *Lophostemon confertus* (brush box)

Pre-clearing area: 279,940 ha

Remnant 2017 area: 179,795 ha (64.2% of pre-clearing)

Bioregions: SEQ (99%), BRB (1%)

Land zones: 11 (57%), 12 (26%), 9-10 (11%), 5 (6%), 8 (0.4%)

Mean annual rainfall range: 1000-2000 mm

Typical landforms: Flat to gently undulating lowlands through to ranges on metamorphic, sedimentary and igneous rocks

Typical soils: Red, Yellow and Brown Dermosols and Kandosols

Structural formation range: Open forests to woodlands

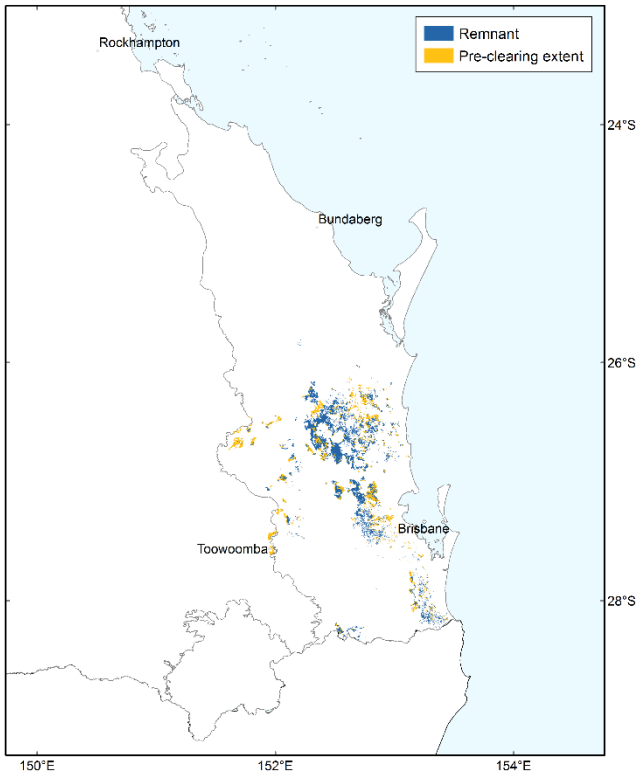


Photo 78 *Eucalyptus biturbinata, E. acmenoides, Corymbia intermedia, E. siderophloia* and *Lophostemon confertus* open forest, 12.11.3. Mt Glorious Rd, Brisbane Forest Park, SEQ.

(TS Ryan)

Floristic characteristics: These open forests to woodlands are characterised by having a number (typically 4-8) of eucalypt species making up the canopy at any site. The most frequent canopy species are *Corymbia intermedia, Eucalyptus siderophloia, E. propinqua, E. microcorys, E. acmenoides, E. carnea, E. tereticornis, E. crebra, E. racemosa* subsp. *racemosa, C. trachyphloia* subsp. *trachyphloia* and *E. biturbinata.* A range of other eucalypts may occur. *Lophostemon confertus* and *Angophora leiocarpa* may be present in the canopy or subcanopy. The sparse subcanopy frequently also contains *Allocasuarina torulosa* or *A. littoralis* and *Acacia disparrima* subsp. *disparrima.* The sparse shrub layer frequently contains *Alphitonia excelsa, Breynia oblongifolia, Acacia maidenii, A. leiocalyx, A. melanoxylon, A. irrorata, A. concurrens Jacksonia scoparia, Wikstroemia indica, Psychotria daphnoides, Denhamia silvestris, Exocarpos cupressiformis, Leucopogon juniperinus* and *Acrotriche aggregata.* The ground layer is usually mid-dense and dominated by *Imperata cylindrica, Themeda triandra, Entolasia stricta, Eremochloa bimaculata* and *Ottochloa gracillima.* Other frequent graminoids are *Cymbopogon refractus, Digitaria parviflora, Lepidosperma laterale, Panicum effusum, Oplismenus aemulus, Alloteropsis semialata, Poa labillardierei, Cyperus laevis, Microlaena stipoides* and *Paspalidium distans.* Frequent forbs are *Desmodium rhytidophyllum, D. gunnii, Cyanthillium cinereum, Eustrephus latifolius, Lobelia purpurascens, Lomandra longifolia, Glycine clandestina, Hardenbergia violacea, Goodenia rotundifolia, Dianella caerulea, Plectranthus parviflorus, Clematicissus opaca, Afrohybanthus stellarioides* and *Smilax australis.*

Table 21 Five most extensive regional ecosystems included in BVG 9a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.11.3	*Eucalyptus siderophloia, E. propinqua* ± *E. microcorys*, *Lophostemon confertus, Corymbia intermedia, E. acmenoides* open forest on metamorphics ± interbedded volcanics	142,558	96,761	6	NC
12.12.15	*Corymbia intermedia* ± *Eucalyptus propinqua, E. siderophloia, E. microcorys, Lophostemon confertus* open forest on Mesozoic to Proterozoic igneous rocks	72,736	54,162	74	NC
12.9-10.17	*Eucalyptus acmenoides, E. major, E. siderophloia* ± *Corymbia citriodora* subsp. *variegata* woodland on sedimentary rocks	20,373	8,858	43	NC
12.11.3a	*Lophostemon confertus* ± *Eucalyptus microcorys, E. carnea, E. propinqua, E. major, E. siderophloia* woodland on metamorphics ± interbedded volcanics	17,915	10,993	61	NC
12.5.6b	*Eucalyptus siderophloia, E. propinqua* open forest +/- *Corymbia intermedia, E. microcorys, E. acmenoides, E. tereticornis, E. biturbinata, E. pilularis, Lophostemon confertus*	12,038	1,561	13	E

Photo 79 *Corymbia intermedia, Eucalyptus siderophloia, E. microcorys, Lophostemon confertus* open forest with understorey of *Allocasuarina torulosa* on andesite, 12.12.15. Bellthorpe NP, Woodford, SEQ.
(TS Ryan)

Photo 80 *Corymbia trachyphloia* and *Eucalyptus acmenoides* open forest with shrub layer of *Acacia complanata* and *Xanthorrhoea johnsonii.* The ground layer is dominated by *Entolasia stricta*, 12.9-10.21. Cania Gorge NP, SEQ.
(TS Ryan)

Photo 81 *Eucalyptus carnea* with *Corymbia citriodora* subsp. *variegata, Eucalyptus crebra* and *E. major* open forest,12.9-10.17c. Karawatha Forest Park, SEQ.
(VJ Neldner)

9b Moist to dry woodlands dominated by *Eucalyptus platyphylla* (poplar gum) and/or *E. leptophleba* (Molloy red box). Other frequent tree species include *Corymbia clarksoniana* (grey bloodwood), *E. drepanophylla* (grey ironbark) and occasionally *E. chlorophylla*

Pre-clearing area: 552,814 ha

Remnant 2017 area: 443,751 ha (80.3% of pre-clearing)

Bioregions: CYP (29%), CQC (23%), BRB (22%), WET (15%), EIU (10%)

Land zones: 12 (56%), 11 (26%), 3 (10%), 10 (4%), 5 (3%)

Mean annual rainfall range: >1200 mm

Typical landforms: (1) On coastal low hills and foothills on metamorphic, igneous and rarely sandstone rocks; (2) on alluvial plains and coastal plains

Typical soils: (1) Yellow Dermosols or Brown Kandosols
(2) Redoxic Hydrosols

Structural formation range: Woodland to open woodland

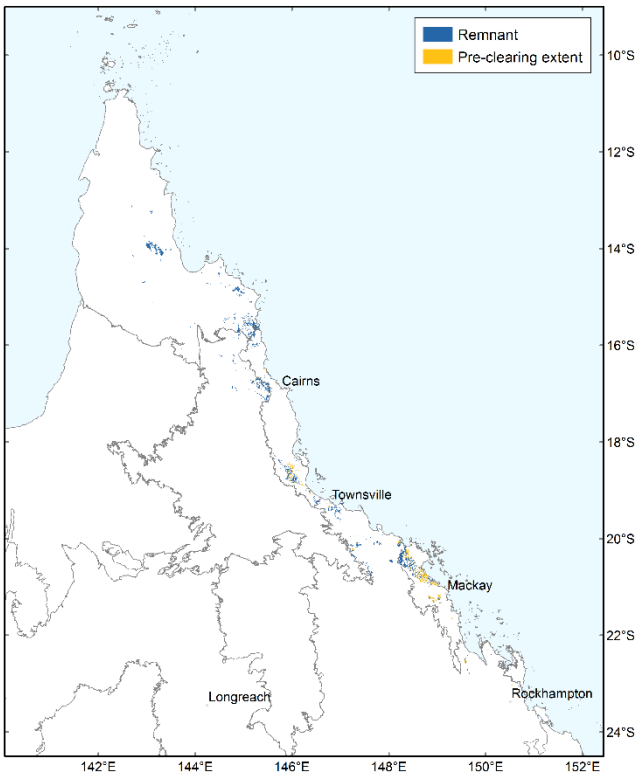


Photo 82 *Eucalyptus platyphylla, E. leptophleba* open woodland, 9.5.9b. North of Mareeba, EIU.
(VJ Neldner)

Floristic characteristics: (1) *Eucalyptus leptophleba* or *E. platyphylla* usually dominate in different communities, although they sometimes occur together. *Corymbia clarksoniana* and *C. dallachiana* are frequent co-dominants that may occur with either species of eucalyptus. The ironbarks *E. crebra, E. drepanophylla* or *E. cullenii* tend to be codominant in *E. platyphylla* communities. *C. tessellaris* and *Erythrophleum chlorostachys* are frequently also present. *E. chlorophylla* dominates woodlands on sandstone and some metamorphic situations. *Melaleuca viridiflora* may sometimes be present in the very sparse subcanopy. Shrubs are very sparse

with *Planchonia careya, Flueggea virosa* subsp*. melanthesoides, Acacia leptocarpa, Ficus opposita, Alphitonia pomaderroides, Canarium australianum* and *Grevillea parallela* being the most frequent additional species. The mid-dense ground layer is dominated by the grasses *Themeda triandra, Heteropogon contortus, H. triticeus, Mnesithea rottboellioides, Sarga plumosum* and *Capillipedium parviflorum.* Frequent forbs include *Flemingia parviflora, Cyanthillium cinereum, Phyllanthus virgatus, Crotalaria montana, C. calycina, C. medicaginea, Wollastonia biflora, Chamaecrista mimosoides, Desmodium rhytidophyllum, Pimelea cornucopiae, Blumea saxatilis, Galactia muelleri, Grewia retusifolia, Ipomoea eriocarpa, Pycnospora lutescens* and *Spermacoce brachystema.*

(2) The vegetation on the alluvial and coastal plains is very similar to (1). *Corymbia clarksoniana* and *C. tessellaris* are frequent co-dominants, however the ironbarks are generally not present. *Lophostemon suaveolens* may be a frequent subcanopy tree. The ground and shrub layers are very similar to (1).

Table 22 Five most extensive regional ecosystems included in BVG 9b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.12.9	*Eucalyptus platyphylla* woodland on igneous rocks	111,558	95,779	86	NC
8.12.6a	*Eucalyptus drepanophylla* and *E. platyphylla* woodland on low hills and foothills on Mesozoic to Proterozoic igneous rocks (subregions 2, 3 and 6)	64,487	44,724	69	NC
3.12.18a	*Eucalyptus leptophleba and Corymbia clarksoniana woodland to open woodland on steep to low igneous hills.*	48,079	47,840	100	NC
8.12.20a	*Eucalyptus drepanophylla* and/or *E. platyphylla* woodland on low gently undulating landscapes (grading into land zone 3 or 5) on Mesozoic to Proterozoic igneous rocks (subregions 2 and 6)	42,487	16,437	39	OC
9.11.7a	*Eucalyptus platyphylla* and/or *E. cullenii* ± *Corymbia clarksoniana* woodland on texture contrast soils on metamorphic hills	34,518	32,756	95	NC

Photo 83 *Eucalyptus drepanophylla* and *E. platyphylla* open forest with *Planchonia careya* and *Vachellia bidwillii* shrubs, and *Mnesithea rottboellioides* and *Heteropogon contortus* grasses, 8.12.6a. Near Bloomsbury township, CQC. (JE Kemp)

Photo 84 *Eucalyptus platyphylla* open woodland with scattered *Corymbia clarksoniana* on slopes of steep hill, 9.11.7a. 20 km NNW of Mareeba on Big Mitchell Reserve, EIU.
(MR Newton)

9c Open forests of Corymbia clarksoniana (grey bloodwood) (or *C. intermedia* (pink bloodwood) or *C. novoguinensis*), *C. tessellaris* (carbeen) ± *Eucalyptus tereticornis* (blue gum) predominantly on coastal ranges. Other frequent tree species include *Eucalyptus drepanophylla* (grey ironbark), *E. pellita* (large-fruited red mahogany), *E. brassiana* (Cape York red gum) and *Lophostemon suaveolens* (swamp box)

Pre-clearing area: 391,328 ha

Remnant 2017 area: 339,929 ha (86.9% of pre-clearing)

Bioregions: WET (52%), CQC (27%), CYP (15%), BRB (3%), EIU (3%), SEQ (0.7%)

Land zones: 12 (75%), 11 (17%), 5 (5%), 8 (4%)

Mean annual rainfall range: >1200 mm

Typical landforms: Coastal hills and ranges

Typical soils: Yellow Kandosols, or Yellow Dermosols

Structural formation range: Open forest to woodlands

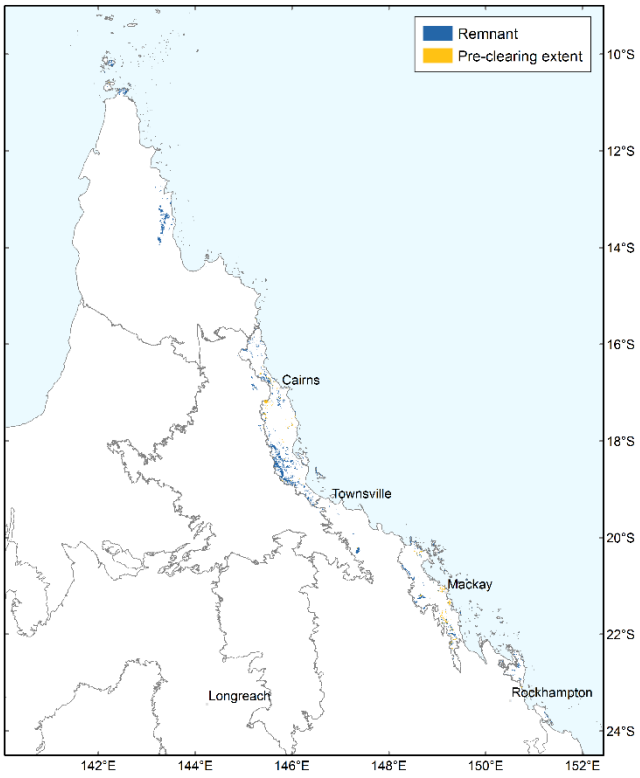


Photo 85 *Corymbia tessellaris* and scattered *Corymbia clarksoniana* open forest over rainforest and *Acacia* spp. in the subcanopy, 7.11.34. Near Cooktown, CYP.
(VJ Neldner)

Floristic characteristics: The mid-dense canopy may be dominated by the bloodwoods *Corymbia intermedia, C. clarksoniana, C. novoguinensis* or *Corymbia tessellaris,* or *Eucalyptus tereticornis* and *E. drepanophylla. Lophostemon suaveolens* and *Allocasuarina torulosa* are also often present in the canopy or a subcanopy. *E. portuensis, E. platyphylla* or *E. brassiana* may sometime form part of the canopy. Additional subcanopy tree species frequently present include *Acacia crassicarpa, Planchonia careya, Parinari nonda, Melaleuca viridiflora* and *Allocasuarina littoralis.* These species may form a sparse shrub layer together with *Ficus*

opposita, Acacia flavescens, A. leptocarpa, Alphitonia pomaderroides, Antidesma ghaesembilla, Breynia cernua, Coelospermum reticulatum, Cupaniopsis anacardioides, Exocarpos latifolius, Flueggea virosa subsp*. melanthesoides, Glochidion lobocarpum, Mallotus philippensis, Persoonia falcata* and *Petalostigma pubescens.* The mid-dense ground layer is dominated by *Themeda triandra, Heteropogon triticeus, H. contortus, Imperata cylindrica* or *Mnesithea rottboellioides.* Other frequent graminoids include *Sorghum nitidum* forma *aristatum, Scleria brownii, S. mackaviensis, Oplismenus burmannii, Paspalidium distans, Alloteropsis semialata* and *Sarga plumosum.* Frequent forbs are *Flemingia parviflora, Dianella caerulea, Cyanthillium cinereum, Lomandra longifolia, Desmodium rhytidophyllum, Eustrephus latifolius, Phyllanthus virgatus, Crotalaria montana, Breynia oblongifolia, Pycnospora lutescens, Aristolochia pubera* and *Brunoniella australis.*

Table 23 Five most extensive regional ecosystems included in BVG 9c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
7.12.29a	*Corymbia intermedia, Eucalyptus tereticornis, E. drepanophylla* open forest to woodland with *Allocasuarina* spp., *Lophostemon suaveolens, Acacia cincinnata, A. flavescens, Banksia aquilonia* and *Xanthorrhoea johnsonii* on uplands, on granite and rhyolite	50,113	49,178	98	NC
7.12.29b	*Corymbia intermedia, Allocasuarina torulosa, Lophostemon suaveolens* open forest and woodland, on uplands, on granite and rhyolite	36,421	35,978	99	NC
8.12.9	*Eucalyptus tereticornis* ± *Corymbia intermedia* ± *Lophostemon suaveolens* woodland on undulating uplands, on igneous rocks	30,227	19,891	66	OC
8.12.32	*Corymbia intermedia* ± *E. portuensis* ±*E. exserta* open forest to woodland with areas of *Allocasuarina* spp. ± *Banksia integrifolia* open forest on high ranges, on Mesozoic to Proterozoic igneous rocks	29,109	27,964	96	NC
7.12.61a	*Eucalyptus tereticornis* open forest to tall open forest and woodland ± *Corymbia intermedia*, *E. drepanophylla, Lophostemon suaveolens* and *Allocasuarina torulosa*, on foothills and uplands on granite and rhyolite	25,150	24,437	97	OC

Photo 86 *Eucalytpus tereticornis* open forest with occasional *Corymbia intermedia* over a grassy ground stratum, 8.12.9. Near Crediton township, CQC.
(JE Kemp)

Photo 87 *Corymbia intermedia* and *Lophostemon suaveolens* woodland. 8.11.3c. Shoalwater Bay Training Area, CQC.
(D Moore)

9d Moist to dry open forests to woodlands dominated by *Eucalyptus portuensis*, *Corymbia intermedia* (pink bloodwood), *E. drepanophylla, E. resinifera or E. reducta +/- Syncarpia glomulifera* (turpentine) or *E. cloeziana* (Gympie messmate) on ranges. Also includes mixed forests with *E. pellita or C. torelliana* (cadaghi) emergents and rainforest understories

Pre-clearing area: 610,467 ha

Remnant 2017 area: 547,202 ha (89.6% of pre-clearing)

Bioregions: WET (40%), CQC (37%), EIU (21%), CYP (2%), BRB (0.3%)

Land zones: 12 (76%), 11 (14%), 3 (4%), 5 (2%), 10 (2%), 9 (1%), 8 (1%)

Mean annual rainfall range: >1200 mm

Typical landforms: on foothills and coastal ranges on granitic and metamorphic rocks

Typical soils: Yellow Dermosols or Kandosols

Structural formation range: Open forest to woodlands

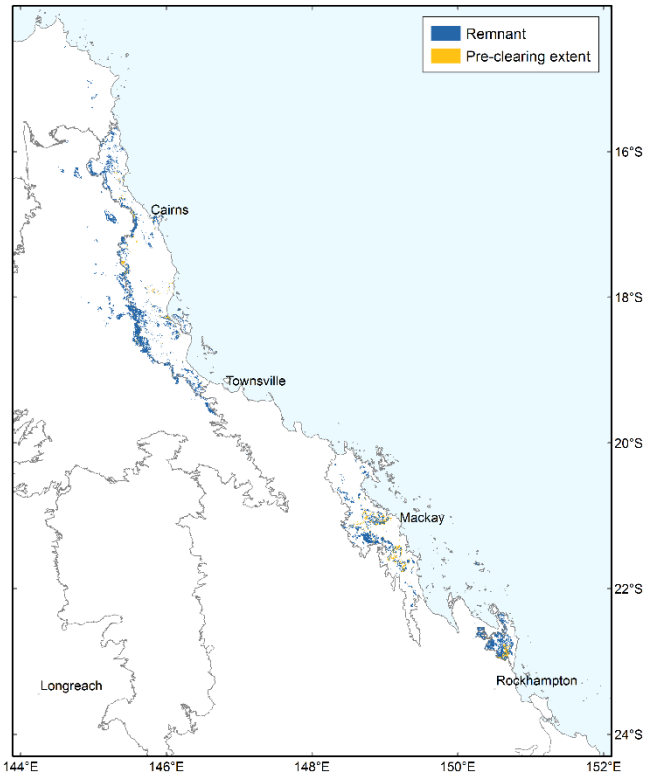


Photo 88 *Corymbia citriodora, Eucalyptus reducta* and *E. crebra* woodland on slopes of low granite hill, 9.12.2, near Ravenshoe, EIU. (MR Newton)

Floristic characteristics: *Eucalyptus portuensis* and *Corymbia intermedia* are the most frequent dominant trees. Some open forests are dominated by *E. drepanophylla, E. resinifera, E. pellita, Syncarpia glomulifera* or *E. cloeziana. E. tereticornis, E. crebra, E. granitica* and *C. citriodora* are frequently present as codominant trees. *Lophostemon confertus, L. suaveolens*

and *Allocasuarina torulosa* are often present as subcanopy trees. *Acacia flavescens, Cycas media* subsp*. media, Persoonia falcata, Planchonia careya, Xanthorrhoea johnsonii, Alphitonia excelsa, Ficus opposita, Acacia leptocarpa, Grevillea parallela* and *Mallotus philippensis* are frequent in the shrub/ low tree layer. The dense ground layer is dominated by *Themeda triandra, Heteropogon triticeus, H. contortus, Imperata cylindrica* or *Mnesithea rottboellioides.* Other frequent graminoids include *Scleria brownii, Eragrostis brownii, Oplismenus burmannii, Entolasia stricta, Paspalidium distans, Eremochloa bimaculata, Fimbristylis dichotoma, Abildgaardia ovata, Arundinella setosa, Chrysopogon fallax* and *Sarga plumosum.* Frequent forbs are *Flemingia parviflora, Dianella caerulea, Cyanthillium cinereum, Lomandra longifolia, Desmodium rhytidophyllum, Eustrephus latifolius, Phyllanthus virgatus, Crotalaria montana, Glycine cyrtoloba* and *Brunoniella australis.*

Table 24 Five most extensive regional ecosystems included in BVG 9d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.12.2	*Eucalyptus portuensis, Corymbia citriodora, E. granitica* or *E. crebra, C. intermedia* or *C. clarksoniana* mixed woodland on steep hills and ranges on igneous hills	116,853	115,493	99	NC
8.12.12a	*Corymbia intermedia* and/or *Eucalyptus platyphylla* ± *E. drepanophylla* ± *E. tereticornis* ± *C. tessellaris* ± *E. portuensis* open forest, on foothills and uplands	111,016	78,525	71	NC
7.12.34	*Eucalyptus portuensis* and/or *E. drepanophylla*, ± *C. intermedia* ± *C. citriodora*, ± *E. granitica* open woodland to open forest, on uplands on granite	52,243	50,596	97	NC
8.12.5b	*Eucalyptus portuensis* and/or *E. exserta* and/or *Corymbia trachyphloia* and/or *E. fibrosa* ± *C. intermedia* open forest	26,613	24,863	93	NC
8.12.31a	*Eucalyptus resinifera* and/or *E. portuensis* and/or *E. acmenoides* open forest on high, moist upper slopes of ranges	25,288	24,848	98	NC

Photo 89 *Eucalyptus drepanophylla, Corymbia intermedia,* and *Eucalyptus platyphylla* open forest with *Cycas media* subsp. *media* and *Mnesithea rottboellioides* grass, 8.12.12a. Cathu SF, CQC.
(JE Kemp)

Photo 90 *Eucalyptus resinifera, Corymbia intermedia* and *Eucalyptus portuensis* open forest over a subcanopy tree layer of *Lophostemon confertus*. 8.12.31a. Near Crediton SF, CQC.
(JE Kemp)

9e Open forests, woodlands and open woodlands dominated by *Corymbia clarksoniana* (grey bloodwood) (or *C. novoguinensis* or *C. intermedia* (pink bloodwood) or *C. polycarpa* (long-fruited bloodwood)) frequently with *Erythrophleum chlorostachys* (red ironwood) or *Eucalyptus platyphylla* (poplar gum) predominantly on coastal sandplains and alluvia

Pre-clearing area: 1,506,094 ha

Remnant 2017 area: 941,203 ha (62.5% of pre-clearing)

Bioregions: BRB (37%), CYP (32%), CQC (17%), WET (9%), EIU (6%)

Land zones: 3 (85%), 5 (12%), 2 (3%)

Mean annual rainfall range: >1200 mm in most coastal locations; down to 600 mm inland

Typical landforms: Alluvial and erosional plains; dunefields

Typical soils: Redoxic Hydrosols, Yellow Dermosols

Structural formation range: Open forests, woodlands and open woodlands

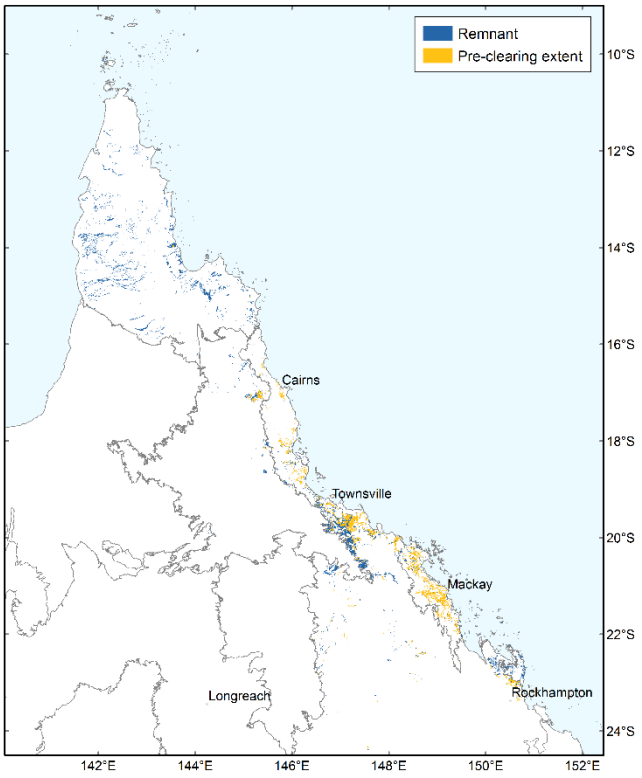


Photo 91 *Eucalyptus platyphylla, Lophostemon suaveolens* and *Corymbia clarksoniana* woodland on alluvial plains, 8.3.5. CQC. (JE Kemp)

Floristic characteristics: The mid-dense canopy is either dominated by bloodwoods; most frequently *Corymbia clarksoniana*, (or *C. intermedia, C. novoguinensis,* or *C. polycarpa)* and/ or *C. tessellaris,* or *Eucalyptus platyphylla* or less frequently *E. tereticornis. Lophostemon suaveolens* and *Erythrophleum chlorostachys* are sometimes codominant trees. *Melaleuca viridiflora, M. nervosa, Planchonia careya, Grevillea glauca, Parinari nonda, Acacia flavescens, A. crassicarpa, Alphitonia pomaderroides* and *Banksia integrifolia* subsp*. compar* are frequently present in a sparse low tree layer. Additional species that may be present on the sparse shrub layer are *Coelospermum reticulatum, Petalostigma pubescens, Acacia leptocarpa, Lithomyrtus obtusa, Ficus opposita, Antidesma ghaesembilla* and *Cupaniopsis anacardioides.* The mid-dense ground layer is dominated by *Themeda triandra, Heteropogon triticeus, H. contortus,* or *Imperata cylindrica.* Other frequent graminoids are *Sarga plumosum, Alloteropsis semialata, Eremochloa bimaculata, Mnesithea rottboellioides, Schizachyrium fragile* and *Fimbristylis dichotoma.* Frequent forbs include *Flemingia parviflora, Dianella caerulea, Phyllanthus virgatus, Cyanthillium cinereum, Crotalaria montana, Blumea saxatilis, Eustrephus latifolius, Lomandra longifolia, Glycine tomentella* and *Spermacoce brachystema.*

Table 25 Five most extensive regional ecosystems included in BVG 9e

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.20	*Corymbia clarksoniana* or *C. novoguinensis* woodland on alluvial plains	445,196	442,388	99	NC
8.3.5	*Eucalyptus platyphylla* and/or *Lophostemon suaveolens* and/or *Corymbia clarksoniana* woodland on alluvial plains	153,944	20,992	14	E
11.3.35	*Eucalyptus platyphylla, Corymbia clarksoniana* woodland on alluvial plains	152,000	94,701	62	NC
11.3.9	*Eucalyptus platyphylla, Corymbia* spp. woodland on alluvial plains	143,417	62,237	43	OC
11.3.7	*Corymbia* spp. woodland on alluvial plains	139,418	62,454	45	NC

Photo 92 *Eucalyptus platyphylla* woodland on level plain. 11.3.9. Shoalwater Bay Training Area, BBN
(AL Kelly)

Photo 93 *Corymbia clarksoniana* woodland, 3.5.41. Moreton Telegraph Station, CYP.
(MR Newton)

9f Woodlands dominated by *Corymbia* spp. e.g. *C. intermedia* (pink bloodwood), *C. tessellaris* (Moreton Bay ash) and/or *Eucalyptus* spp. such as *E. tereticornis* (blue gum), frequently with *Banksia* spp., *Acacia* spp. and *Callitris columellaris* (Bribie Island pine) on coastal dunes and beach ridges

Pre-clearing area: 43,568 ha

Remnant 2017 area: 31,168 ha (71.5% of pre-clearing)

Bioregions: SEQ (100%)

Land zones: 2 (100%)

Mean annual rainfall range: 1200-2000 mm

Typical landforms: (1) Coastal dunes, and sandplains; (2) beach ridges

Typical soils: Bleached Orthic Tenosols, Aeric Podosols

Structural formation range: Open forests to woodlands

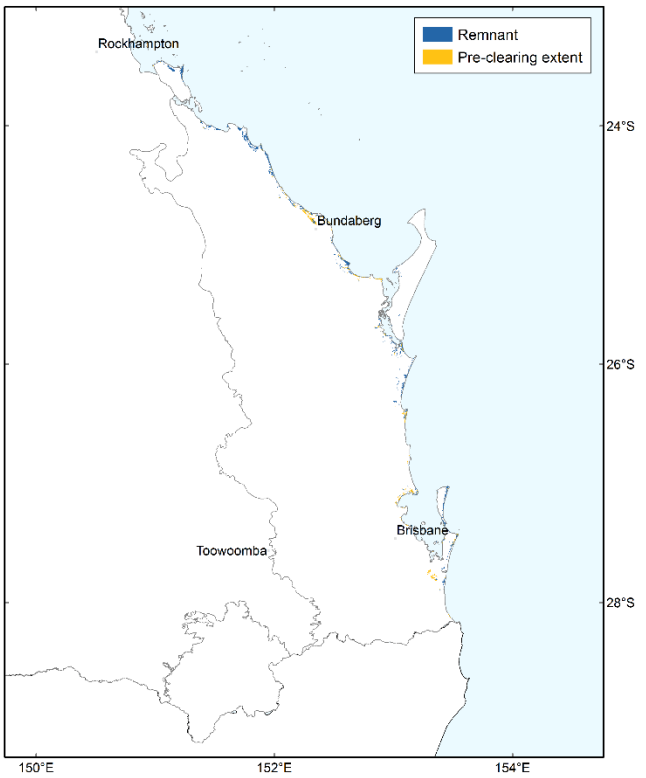


Photo 94 *Corymbia tessellaris, Eucalyptus tereticornis, C. intermedia* and *Lopostemon suaveolens* woodland in swales, 12.2.11. Burrum Heads, SEQ. (TS Ryan)

Floristic characteristics: *Corymbia tessellaris* or *C. intermedia* dominate the sparse canopy on the beach ridges frequently with *Eucalyptus tereticornis, Lophostemon suaveolens, L. confertus, Callitris columellaris* and/or *Melaleuca dealbata*. *Acacia disparrima* subsp. *disparrima, A. leiocalyx, Banksia integrifolia* and *Livistona decora* may be present in the

subcanopy layer. The sparse shrub layer frequently is composed of *Persoonia virgata, P. stradbrokensis, Monotoca* sp. (Fraser Island P.Baxter 777), *Leucopogon margarodes, L. pimeleoides, Leptomeria acida* and *Styphelia viridis.* Graminoids frequently in the mid-dense ground layer include *Themeda triandra, Eriachne pallescens, Caustis recurvata, C. blakei, Imperata cylindrica, Lepidosperma laterale* and *Entolasia stricta.* Frequent forbs include *Pteridium esculentum, Lomandra longifolia, L. multiflora, Platysace ericoides* and *Dianella caerulea.*

Table 26 The two regional ecosystems included in BVG 9f

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.2.11	*Corymbia tessellaris* ± *Eucalyptus tereticornis*, *C. intermedia* and *Livistona decora* woodland on beach ridges in northern half of bioregion	27,739	20,588	74	NC
12.2.5	*Corymbia intermedia* ± *Lophostemon confertus* ± *Banksia* spp. ± *Callitris columellaris* open forest on beach ridges usually in southern half of bioregion	15,829	10,579	67	OC

Photo 95 *Corymbia intermedia, Lophostemon confertus* open forest on sand, 12.2.5. Woorim, SEQ. (TS Ryan)

Photo 96 *Corymbia intermedia* and *Lophostemon confertus* open forest on beach ridges. 12.2.5. Cooloola NP, SEQ. (TS Ryan)

Photo 97 *Corymbia intermedia, Lophostemon confertus and Banksia integrifolia* subsp. *integrifolia* open forest, 12.2.5. Noosa Headland, Noosa NP, SEQ. (VJ Neldner)

9g Moist to dry woodlands to open forests dominated by stringybarks or mahoganies such as *Eucalyptus tindaliae* (Queensland white stringybark), *E. latisinensis* (white mahogany), *E. acmenoides* (narrow-leaved white stringybark); or *E. racemosa* (scribbly gum) or *E. seeana* or *E. tereticornis* (blue gum) and *Corymbia intermedia* (pink bloodwood)

Pre-clearing area: 844,210 ha

Remnant 2017 area: 325,955 ha (38.6% of pre-clearing)

Bioregions: SEQ (99.8%), BRB (0.2%)

Land zones: 5 (44%), 12 (32%), 9-10 (9%), 2 (9%), 11 (6%), 8 (0.4%), 3 (0.3%)

Mean annual rainfall range: 1000-2000 mm

Typical landforms: Coastal remnant Tertiary surfaces and dunes

Typical soils: Red Kandosols and Red Dermosols, and Aeric Podosols or Tenosols

Structural formation range: Woodland to open woodland

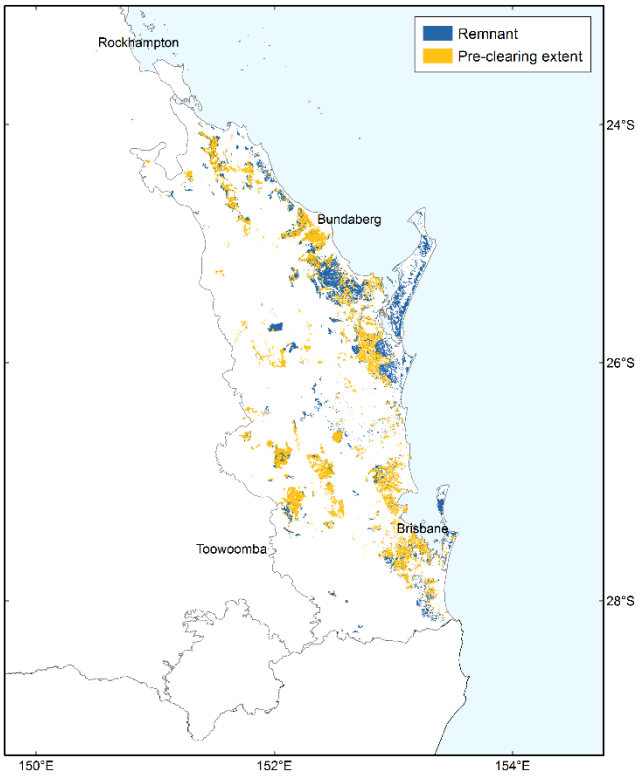


Photo 98 *Corymbia trachyphloia* subsp. *trachyphloia, Eucalyptus latisinensis* and *Eucalyptus exserta* woodland, 12.5.4. Vernon Conservation Park, SEQ.
(MJ Laidlaw)

Floristic characteristics (SEQ remnant surfaces): *Corymbia intermedia, C. trachyphloia* subsp*. trachyphloia, Eucalyptus latisinensis, E. exserta* and *Angophora leiocarpa* codominate the mid-dense canopy. *Eucalyptus racemosa* dominates in some areas or maybe a co-dominant or absent in other areas. *Melaleuca viridiflora* var*. viridiflora, Lophostemon suaveolens* and *L. confertus* are frequent in the very sparse subcanopy. The shrub layer is very sparse with *Acacia leiocalyx, A. disparrima* subsp*. disparrima, A. flavescens, Allocasuarina littoralis, Grevillea banksii, Alphitonia excelsa, Banksia integrifolia* subsp*. compar* and *Jacksonia scoparia* frequent species. The mid-dense ground layer is dominated by

Themeda triandra, Eremochloa bimaculata, Entolasia stricta, Digitaria parviflora, Imperata cylindrica, Lepidosperma laterale var. *laterale, Paspalidium distans, Panicum effusum, Alloteropsis semialata, Aristida queenslandica, A. warburgii, Eriachne pallescens* and *Eragrostis brownii.* Frequent forbs are *Xanthorrhoea johnsonii, X. latifolia, Dianella longifolia, Pteridium esculentum, Lobelia purpurascens, Goodenia rotundifolia, Gompholobium pinnatum, Desmodium rhytidophyllum, Velleia spathulata, Cyanthillium cinereum, Lomandra multiflora* and *Patersonia sericea.*

Floristic characteristics (SEQ coastal dunes): *Eucalyptus racemosa* subsp. *racemosa* dominates the mid-dense canopy on the coastal dunes. *Corymbia intermedia* or *C. gummifera, E. pilularis* and *Angophora leiocarpa* are frequent codominant trees. *Banksia aemula, Allocasuarina torulosa, Leptospermum trinervium* and *Lophostemon confertus* are often present in the very sparse subcanopy. The sparse shrub layer frequently is composed of *Persoonia virgata, P. stradbrokensis, Monotoca* sp. (Fraser Island P.Baxter 777), *Leucopogon margarodes, L. pimeleoides, Leptomeria acida* and *Styphelia viridis.* Graminoids frequently in the mid-dense ground layer which is often dominated by *Xanthorrhoea johnsonii* include *Themeda triandra, Eriachne pallescens, Caustis recurvata, C. blakei, Imperata cylindrica, Lepidosperma laterale* and *Entolasia stricta.* Frequent forbs include *Pteridium esculentum, Lomandra longifolia, L. multiflora, Platysace ericoides* and *Dianella caerulea.*

Table 27 Five most extensive regional ecosystems included in BVG 9g

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.12.12	*Eucalyptus tereticornis, Corymbia intermedia, E. crebra* ± *Lophostemon suaveolens* woodland on Mesozoic to Proterozoic igneous rocks	236,364	51,094	22	OC
12.5.4	*Eucalyptus latisinensis* ± *Corymbia intermedia, C. trachyphloia* subsp. *trachyphloia*, *Angophora leiocarpa, Eucalyptus exserta* woodland on complex of remnant Tertiary surfaces; Cainozoic and Mesozoic sediments	194,041	94,385	49	NC
12.2.6	*Eucalyptus racemosa* subsp. *racemosa* open forest on dunes and sand plains. Usually deeply leached soils	73,461	69,265	94	NC
12.5.12	*Eucalyptus racemosa, E. latisinensis* ± *Corymbia gummifera, C. intermedia, E. bancroftii* woodland with heathy understorey on Tertiary surfaces	56,082	15,803	28	OC
12.9-10.4	*Eucalyptus racemosa* subsp. *racemosa* woodland on sedimentary rocks	51,931	19,756	38	NC

Photo 99 *Eucalyptus racemosa* woodland, 12.2.6. Fraser Island, SEQ. (VJ Neldner)

Photo 100 *Eucalyptus racemosa* woodland, 12.9-10.4 Karawatha Forest Park, SEQ. (VJ Neldner)

9h Dry woodlands dominated by species such as *Eucalyptus acmenoides* (narrow-leaved white stringybark) (or *E. portuensis* or *E. helidonica*), *E. tereticornis* (blue gum), *Angophora leiocarpa* (rusty gum), *Corymbia trachyphloia* (yellow bloodwood) or *C. intermedia* (pink bloodwood), and often ironbarks including *E. crebra* (narrow-leaved red ironbark) or *E. fibrosa* (dusky-leaved ironbark). A heathy shrub layer is frequently present. On undulating to hilly terrain

Pre-clearing area: 321,156 ha

Remnant 2017 area: 225,998 ha (70.4% of pre-clearing)

Bioregions: SEQ (92%), BRB (8%)

Land zones: 12 (52%), 9-10 (25%), 11 (17%), 8 (3%), 5 (2%)

Mean annual rainfall range: 800-2000 mm

Typical landforms: On undulating foothills to hills and ranges on igneous or metamorphic rocks often with inter-bedded volcanics

Typical soils: Red Dermosols and Kandosols

Structural formation range: Woodlands to open forests

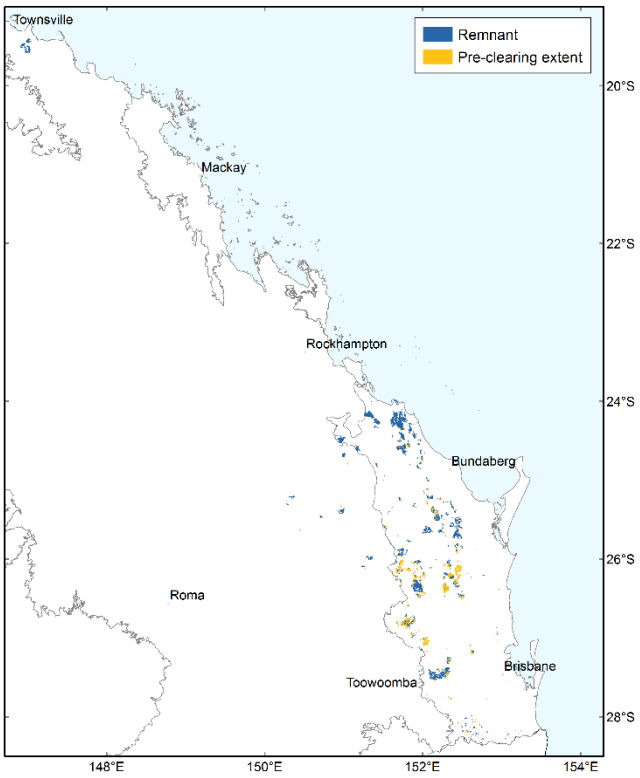


Photo 101 *Eucalyptus exserta, E. crebra, Angophora leiocarpa* and *Corymbia clarksoniana* open forest on granite, 12.12.21. North of Middle Creek Campground Road, SEQ. (TS Ryan)

Floristic characteristics: *Eucalyptus tereticornis,* together with *Corymbia intermedia* and *E. crebra,* dominate the sparse canopy in some situations. *Eucalyptus acmenoides* or *E. portuensis* and *C. trachyphloia* subsp*. trachyphloia* dominate elsewhere*.* Other canopy species that may be present include *E. exserta, E. fibrosa* subsp. *fibrosa, Angophora leiocarpa* and *Corymbia citriodora* subsp. *variegata. Lophostemon suaveolens* or *L. confertus trees* may form a very sparse subcanopy. The shrub layer is generally very sparse with *Acacia disparrima* subsp*. disparrima, Jacksonia scoparia, Acacia leiocalyx* and *Alphitonia excelsa* the most

frequent species. The mid-dense ground layer is dominated by the graminoids *Themeda triandra, Cymbopogon refractus, Eremochloa bimaculata, Entolasia stricta, Lepidosperma laterale, Scleria brownii, Arundinella nepalensis, Panicum effusum, Aristida queenslandica* var. *dissimilis, A. spuria, Digitaria parviflora, Chrysopogon fallax, Imperata cylindrica* and *Paspalidium gausum.* Frequent forbs include *Desmodium rhytidophyllum, Cyanthillium cinereum, Dianella caerulea, Hardenbergia violacea, Eustrephus latifolius, Phyllanthus virgatus, Crotalaria montana, Lomandra confertifolia* subsp. *pallida, Afrohybanthus stellarioides, Breynia oblongifolia* and *Cheilanthes sieberi.*

Table 28 Five most extensive regional ecosystems included in BVG 9h

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.12.11	*Eucalyptus portuensis* or *E. acmenoides*, *Corymbia trachyphloia* subsp. *trachyphloia* woodland on Mesozoic to Proterozoic igneous rocks	62,516	54,499	87	NC
12.12.24	*Angophora leiocarpa, Eucalyptus crebra* woodland on Mesozoic to Proterozoic igneous rocks	52,228	18,836	36	OC
12.9-10.21	*Eucalyptus acmenoides* or *E. portuensis* woodland usually with *Corymbia trachyphloia* subsp. *trachyphloia* on Cainozoic to Proterozoic sediments	37,618	31,811	85	NC
12.11.22	*Angophora leiocarpa, Eucalyptus crebra* woodland on metamorphics ± interbedded volcanics	23,635	13,296	56	NC
12.9-10.5a	*Eucalyptus helidonica, Corymbia citriodora* subsp. *variegata* ± *C. trachyphloia* subsp. *trachyphloia, Eucalyptus fibrosa* subsp. *fibrosa, E. taurina* open forest on quartzose sandstone in the Helidon hills region	17,535	14,834	85	NC

Photo 102 *Eucalyptus tereticornis, E. crebra, Angophora leiocarpa* woodland, 12.12.12. Nanango, SEQ.
(TS Ryan)

Photo 103 *Eucalyptus crebra, E. tereticornis, Corymbia intermedia* woodland, 12.12.23. Pine Mountain SF, SEQ.
(TS Ryan)

10 *Corymbia citriodora* (spotted gum) dominated open forests to woodlands on undulating to hilly terrain

10a Dry woodlands to open woodlands dominated by *Corymbia citriodora* (spotted gum)

Pre-clearing area: 1,795,111 ha

Remnant 2017 area: 1,458,942 ha (81.3% of pre-clearing)

Bioregions: BRB (99%), NET (1%), DEU, WET, SEQ, EIU, CQC (minor)

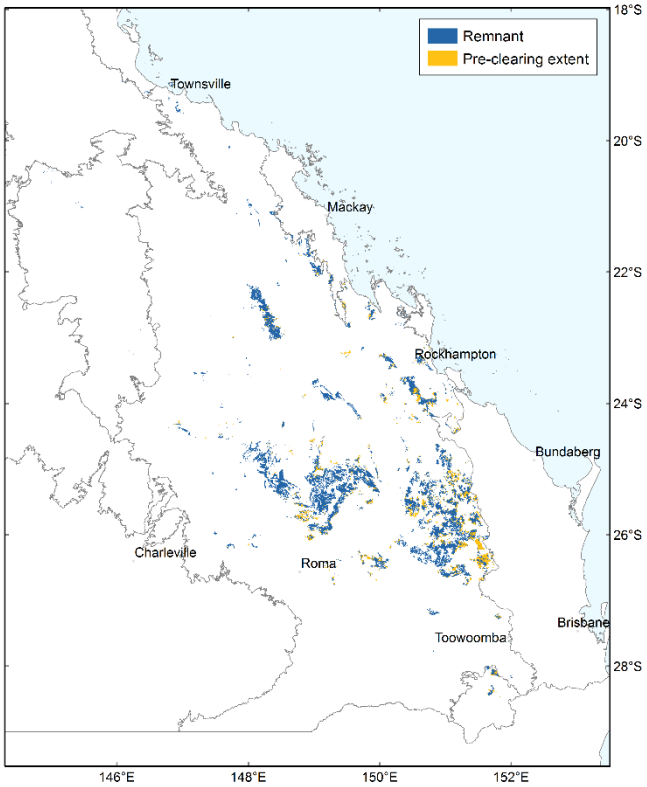
Land zones: 10 (55%), 7 (23%), 12 (13%), 11 (9%), 5 (0.2%), 3 (0.1%)

Mean annual rainfall range: 600-1200 mm

Typical landforms: Ranges and plateaus of sandstone, acid volcanic and metamorphic origin

Typical soils: Red Dermosols, Kandosols and Chromosols

Structural formation range: Woodland to open woodland



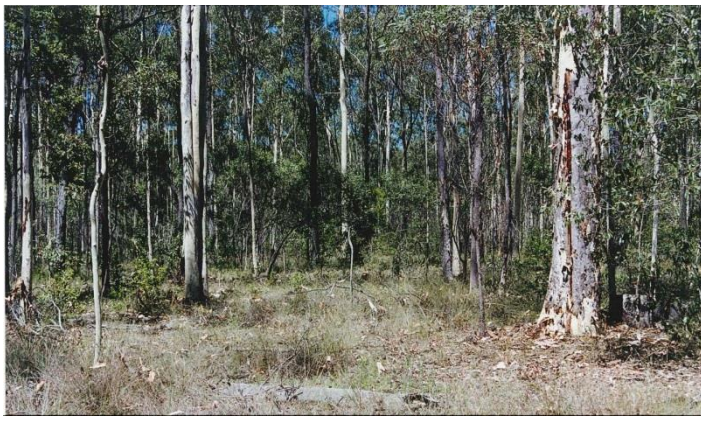


Photo 104 *Corymbia citriodora* and *Eucalyptus crebra* woodland on Cainozoic lateritic duricrust, 11.7.6. Barakula SF, BRB. (TJ Eyre)

Floristic characteristics: *Corymbia citriodora* subsp. *citriodora* dominates the mid-dense canopy often with *Eucalyptus crebra* or *E. fibrosa* subsp*. fibrosa. Corymbia clarksoniana* and *Angophora leiocarpa* are frequently present in the canopy. *Alphitonia excelsa, Acacia leiocalyx, A. cretata, A. longispicata, Petalostigma pubescens, Breynia oblongifolia* and *Capparis canescens* are frequently present in the very sparse shrub layer. The sparse ground layer is dominated by the grasses *Cymbopogon refractus, Themeda triandra, Eremochloa bimaculata, Arundinella nepalensis* and *Panicum effusum.* Frequent forbs include *Desmodium varians, Brunoniella australis Cyanthillium cinereum, Chrysocephalum apiculatum Eustrephus latifolius, Dianella revoluta, Phyllanthus virgatus, Evolvulus alsinoides Lomandra confertifolia* subsp*. pallida, L. multiflora* subsp*. multiflora,* and *Glossocardia bidens.*

Table 29 Five most extensive regional ecosystems included in BVG 10a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	988,121	857,601	87	NC
11.7.6	*Corymbia citriodora* or *Eucalyptus crebra* woodland on Cainozoic lateritic duricrust	413,835	335,307	81	NC
11.12.6	*Corymbia citriodora* open forest on igneous rocks (granite)	134,832	73,576	55	NC
11.11.3	*Corymbia citriodora, Eucalyptus crebra, E. acmenoides* open forest on old sedimentary rocks with varying degrees of metamorphism and folding. Coastal ranges	126,195	88,689	70	NC
11.12.6a	*Eucalyptus crebra* ± *Corymbia citriodora and/or E. acmenoides* ± *Lophostemon suaveolens* woodland to open forest	80,619	69,778	87	NC

Photo 105 *Corymbia citriodora* woodland on coarse-grained sedimentary rocks, 11.10.1, Serecold SF, south of Rolleston, BRB.
(AL Kelly)

Photo 106 *Corymbia citriodora* open forest on igneous rocks, 11.12.6, Auburn Range, west of Monto, BRB.
(K Jones)

Photo 107 *Corymbia citriodora* tall open forest with occasional *Eucalyptus crebra*, and a mid-dense subcanopy of whipstick *Lophostemon confertus*, 11.10.1.
Cania Gorge NP, BRB.
(TS Ryan)

10b Moist open forests to woodlands dominated by *Corymbia citriodora* (spotted gum)

Pre-clearing area: 1,544,140 ha

Remnant 2017 area: 983,245 ha (63.7% of pre-clearing)

Bioregions: SEQ (78%), CQC (13%), EIU (6%), WET (3%), BRB (1%)

Land zones: 12 (39%), 11 (32%), 9-10 (17%), 5 (12%), 8 (1%)

Mean annual rainfall range: 1000-2000 mm

Typical landforms: Coastal and subcoastal hills and ranges of igneous, metamorphic and sedimentary rocks

Typical soils: Red Dermosols, Kandosols and Chromosols

Structural formation range: Open forest to woodland

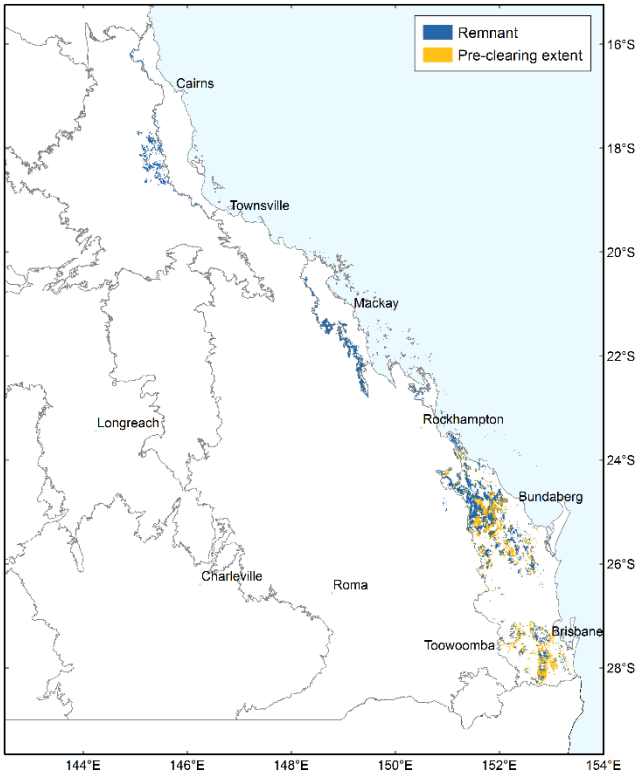


Photo 108 *Corymbia citriodora* subsp. *variegata* and *Eucalyptus crebra* tall open forest, with shrub layer of *Acacia penninervis, Allocasuarina littoralis* and *Jacksonia scoparia*, 12.11.6, south of Goondicum Crater, SE of Monto, SEQ.
(TS Ryan)

Floristic characteristics: *Corymbia citriodora* subsp*. variegata* (mainly in SEQ and southern BRB) with *C. citriodora* subsp*. citriodora* (elsewhere) dominates the mid-dense canopy often with *Eucalyptus crebra* or *E. siderophloia* or *E. fibrosa* subsp*. fibrosa. Corymbia intermedia, C. trachyphloia* subsp*. trachyphloia, E. acmenoides, E. carnea, E. tereticornis* and *Angophora leiocarpa* are frequently present in the canopy. *Lophostemon confertus* and *Allocasuarina torulosa* are sometimes present in the very sparse subcanopy*. Acacia disparrima* subsp*. disparrima, A. falcata, A. fimbriata, A. leiocalyx, A. maidenii, Alphitonia excelsa,* and *Jacksonia scoparia* are frequently present in the very sparse shrub layer. The sparse ground layer is

dominated by the grasses *Themeda triandra, Eremochloa bimaculata, Arundinella nepalensis, Entolasia stricta* and *Cymbopogon refractus.* Other frequent graminoids are *Panicum effusum, Imperata cylindrica, Digitaria parviflora, Eragrostis brownii, Heteropogon contortus, Arundinella nepalensis, Eragrostis spartinoides, Alloteropsis semialata, Aristida queenslandica* var*. queenslandica, Gahnia aspera, Scleria brownii, Lepidosperma laterale* and *Paspalidium distans.* Frequent forbs include *Desmodium rhytidophyllum, Cyanthillium cinereum, Eustrephus latifolius, Brunoniella australis, Hardenbergia violacea, Dianella caerulea, Phyllanthus virgatus, Galactia tenuiflora, Goodenia rotundifolia, Lobelia purpurascens, Lomandra confertifolia* subsp. *pallida, L. multiflora* subsp*. multiflora, L. longifolia, Crotalaria montana, Afrohybanthus stellarioides, Cheilanthes sieberi* and *Dianella longifolia.*

Table 30 Five most extensive regional ecosystems included in BVG 10b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.11.6	*Corymbia citriodora* subsp. *variegata*, *Eucalyptus crebra* woodland on metamorphics ± interbedded volcanics	371,684	236,323	64	NC
12.12.5	*Corymbia citriodora* subsp. *variegata*, *Eucalyptus crebra* open forest on Mesozoic to Proterozoic igneous rocks	341,465	191,218	56	NC
12.9-10.2	*Corymbia citriodora* subsp. *variegata* ± *Eucalyptus crebra* open forest on sedimentary rocks	222,432	87,170	39	NC
8.12.7a	*Corymbia citriodora, Eucalyptus portuensis* ± *C. trachyphloia* ± *C. intermedia* open forest on hills on Mesozoic to Proterozoic igneous rocks (subregion 2)	105,775	101,264	96	NC
12.11.5	*Corymbia citriodora* subsp. *variegata* woodland ± *Eucalyptus siderophloia* or *E. crebra*, *E. carnea*, *E. acmenoides, E. propinqua* on metamorphics ± interbedded volcanics	86,353	52,718	61	NC

Photo 109 *Corymbia citriodora* subsp*. variegata, Eucalyptus crebra,* and *E. exserta* open forest on low hills, 12.9-10.2. near Biggenden, SEQ.
(TS Ryan)

Photo 110 *Eucalyptus portuensis, Corymbia citriodora* and *E. drepanophylla* woodland with *Themeda triandra* and *Aristida* spp. dominated ground layer on plateau, 8.12.7a.
Connors Range, CQC.
(JE Kemp)

11 Moist to dry eucalypt open forests to woodlands mainly on basalt areas (land zone 8)

11a Moist to dry open forests to woodlands dominated by *Eucalyptus orgadophila* (mountain coolibah). Some areas dominated by *E. tereticornis* (blue gum), *E. melliodora* (yellow box), *E. albens* (white box), *E. crebra* (narrow-leaved red ironbark) or *E. melanophloia* (silver-leaved ironbark)

Pre-clearing area: 1,427,703 ha

Remnant 2017 area: 814,929 ha (57.1% of pre-clearing)

Bioregions: BRB (76%), SEQ (16%), EIU (8%), GUP (0.1%)

Land zones: 8 (95%), 11 (3%), 4 (2%), 12 (0.3%)

Mean annual rainfall range: 800-1200 mm

Typical landforms: Predominantly low basaltic ranges and rolling hills

Typical soils: Red Ferrosols and Black Vertosols

Structural formation range: Woodland to open forest

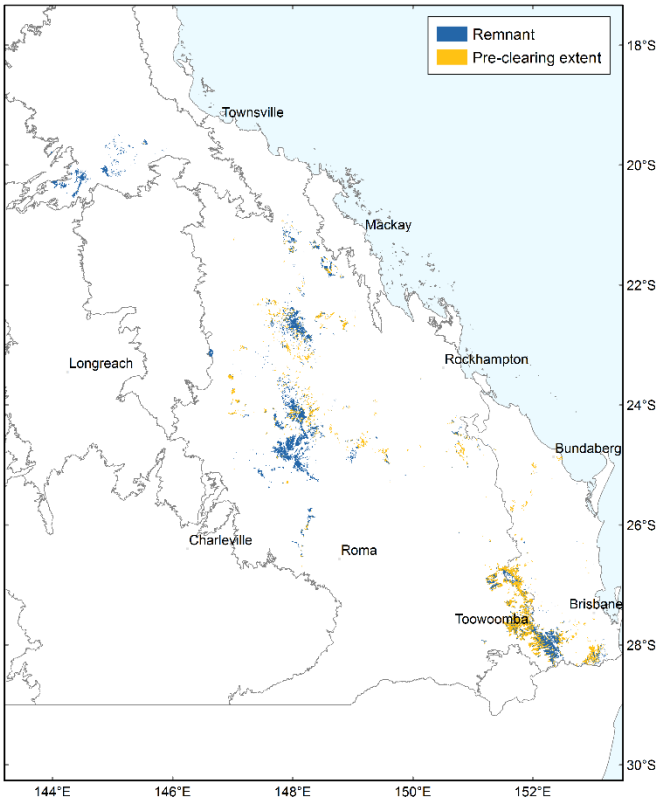


Photo 111 *Eucalyptus orgadophila* open woodland with *Geijera parviflora* understorey, 11.8.5a. Oakey, BRB. (C Pennay)

Floristic characteristics: *Eucalyptus orgadophila*, *Eucalyptus crebra, Eucalyptus melanophloia,* and *Eucalyptus tereticornis* are the most frequent canopy species, with generally only one or two species dominating a site. *Corymbia erythrophloia* and *Eucalyptus melliodora* occur less frequently. The shrub layer is generally sparse. The mid-dense grassy ground layer is dominated by *Heteropogon contortus, Cymbopogon refractus, Themeda*

triandra, Dichanthium sericeum, Aristida spp. and *Cyperus gracilis.* Frequent forbs include *Brunoniella australis, Grewia latifolia, Breynia oblongifolia, Desmodium varians, Rostellularia adscendens, Eustrephus latifolius* and *Galactia tenuiflora.*

REs 11.8.2a and 11.8.8 form a part of the white box-yellow box- Blakely's red gum grassy woodland and derived native grassland critically endangered ecological community. Minor occurrences of this EPBC community occur in 12.8.4, 12.8.16 and 12.8.7.

Table 31 Five most extensive regional ecosystems included in BVG 11a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.8.5	*Eucalyptus orgadophila* open woodland on Cainozoic igneous rocks	604,364	340,643	56	NC
11.8.4	*Eucalyptus melanophloia* open woodland on Cainozoic igneous rocks.	217,356	151,216	70	NC
12.8.16	*Eucalyptus crebra* ± *E. melliodora, E. tereticornis* woodland on Cainozoic rocks	113,429	33,457	29	OC
9.8.9	*Eucalyptus orgadophila* ± *Corymbia* spp. open woodland on basalt plains and rocky basalt hills	109,561	108,609	99	NC
11.8.8	*Eucalyptus albens, E. crebra* woodland on Cainozoic igneous rocks	79,735	35,505	45	NC

Photo 112 *Eucalyptus tereticornis* and *E. melliodora* open forest, 11.8.8. Main Range NP, east of park headquarters on boundary of park, SEQ. (AL Kelly)

Photo 114 *Eucalyptus orgadophila* woodland on basalt plain, 9.8.9, south of Blackbraes NP, EIU. (MR Newton)

Photo 113 *Eucalyptus melliodora* woodland on Cainozoic igneous rocks, 12.8.16. Dalrymple Creek, Goomburra section, Main Range NP, SEQ.
(RE Niehus)

11b Moist to dry open forests to woodlands dominated by *Eucalyptus crebra* (narrow-leaved red ironbark) or *E. tereticornis* (blue gum), frequently with *Corymbia* species or *E. microneura* (Gilbert River box) on red ferrosols on undulating terrain

Pre-clearing area: 1,173,535 ha

Remnant 2017 area: 1,157,689 ha (98.6% of pre-clearing)

Bioregions: EIU (99%), DEU (0.7%), GUP (0.6%)

Land zones: 8 (100%)

Mean annual rainfall range: 500-800 mm

Typical landforms: Flat to gently undulating basaltic derived plains

Typical soils: Red Ferrosols and Red Dermosols

Structural formation range: Woodland to open woodland

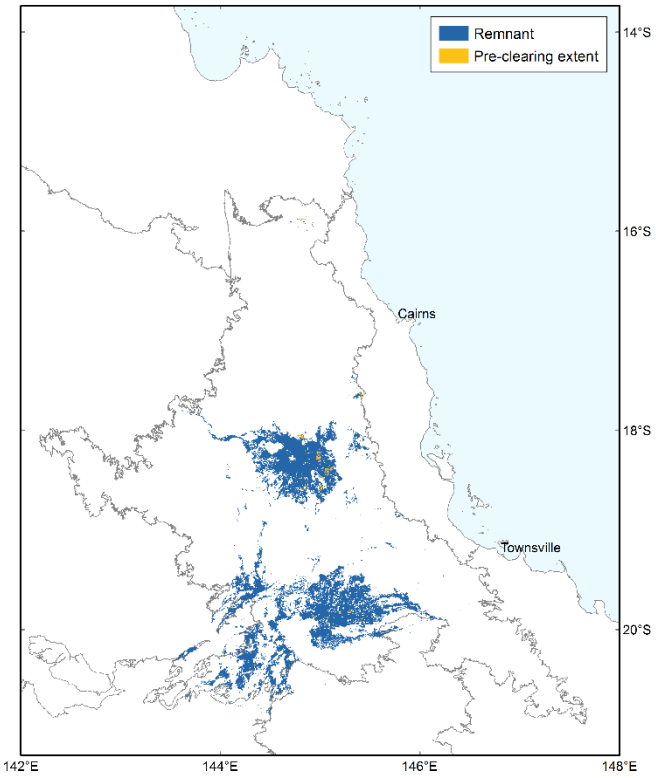


Photo 115 *Eucalyptus crebra* woodland on a basalt plain, 9.8.1a. Reedy Springs Station, NW of Pentland, EIU.

(CPF Kahler)

Floristic characteristics: *Eucalyptus crebra, Corymbia dallachiana* and *Corymbia erythrophloia* are the most frequent dominant species. *Eucalyptus granitica* or *E. microneura* may replace *E. crebra* in some areas. There is generally very sparse shrub cover of *Vachellia bidwillii, Grevillea parallela, Denhamia cunninghamii, Carissa lanceolata* and *Bursaria incana.* The mid-dense ground layer is dominated by *Heteropogon contortus, Themeda triandra, H. triticeus* and *Dichanthium* species. The most frequent forbs are *Indigofera linnaei, Cyanthillium cinereum, Indigofera linifolia, Rhynchosia minima, Rostellularia adscendens, Crotalaria montana* and *Ipomoea eriocarpa.*

Table 32 Five most extensive regional ecosystems included in BVG 11b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.8.1a	*Eucalyptus crebra* and *Corymbia erythrophloia* ± *C. dallachiana* open woodland on basalt plains	984,255	976,378	99	NC
9.8.4a	*Eucalyptus crebra* or *E. granitica* ± *Corymbia intermedia* woodland on basalt plains	77,625	73,698	95	NC
9.8.4b	*Eucalyptus tereticornis* ± *E. crebra* ± *C. dallachiana* open woodland on basalt plains	49,405	47,033	95	NC
9.8.5b	*Corymbia terminalis* open woodland to grassland	37,661	37,613	100	NC
9.8.11	*Eucalyptus microneura* ± *Corymbia* spp. ± *Terminalia* spp. woodland on basalt plains	15,494	15,485	100	NC

Photo 116 *Eucalyptus crebra* open woodland with grassy ground layer on basalt plain, 9.8.4a. Yourka Station, EIU.
(JE Kemp)

Photo 117 *Corymbia terminalis* and *C. dallachiana* open woodland with scattered shrubs in mid-layer, 9.8.5b, south of Porcupine Gorge NP, EIU.
(MR Newton)

Photo 118 *Eucalyptus microneura, Corymbia terminalis* low open woodland; with *Vachellia farnesiana*, *Carissa* spp.,and *Acacia chisholmii* shrubs; and *Aristida* spp. ground cover, 9.8.11, NE of Richmond, EIU.
(HA Dillewaard)

Photo 119 *Corymbia erythrophloia* and *Eucalyptus similis* low woodland on rocky basalt rises, 9.8.11, north of Einasleigh, EIU.
(MR Newton)

11c Moist woodlands dominated by *Eucalyptus leptophleba* (Molloy red box) ± *Corymbia papuana* (ghost gum) ± *C. tessellaris* (carbeen)

Pre-clearing area: 130,640 ha

Remnant 2017 area: 107,308 ha (82.1% of pre-clearing)

Bioregions: EIU (95%), CYP (5%)

Land zones: 8 (97%), 11 (3%)

Mean annual rainfall range: 1000-2000 mm

Typical landforms: Tertiary basalt plains and low ranges

Typical soils: Red Ferrosols and Red Dermosols

Structural formation range: Woodland to open woodland

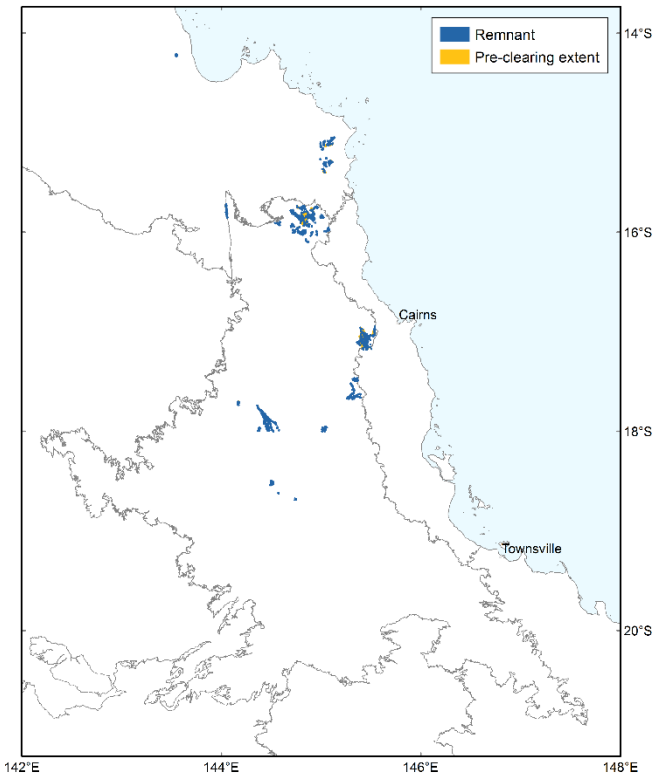


Photo 120 *Eucalyptus leptophleba* woodland on basalt rises, 9.8.2a. South of Mareeba township, EIU. (MR Newton)

Floristic characteristics: *Eucalyptus leptophleba* is the most frequent and usually dominant tree. *Corymbia clarksoniana, C. dallachiana* and *C. erythrophloia* may be co-dominant trees. The shrub layer is usually very sparse with *Planchonia careya, Grewia retusifolia*, and *Antidesma ghaesembilla* the most frequent species. The dense ground layer is dominated by

the grasses *Heteropogon contortus, H. triticeus, Themeda triandra, Sarga plumosum* and *Mnesithea rottboellioides.* Frequent forbs include *Crotalaria montana, Cayratia trifolia, Flemingia parviflora* and *Rhynchosia minima.*

Table 33 Five most extensive regional ecosystems included in BVG 11c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.8.1b	*Eucalyptus leptophleba* ± *C. erythrophloia* ± *C. dallachiana* open woodland on basalt plains	85,342	83,182	97	NC
9.8.2a	*Eucalyptus leptophleba* ± *Corymbia clarksoniana* ± *Corymbia dallachiana* woodland on Tertiary basalts	35,439	16,779	47	OC
3.8.3a	*Eucalyptus leptophleba* ± *Corymbia clarksoniana* woodland on basalt flows	6,012	3,329	60	E
9.11.32	*Eucalyptus leptophleba* and/or *Corymbia terminalis* ± *C. dallachiana* woodland on aprons surrounding limestone outcrops	3,445	3,329	96	OC
9.8.1c	*Eucalyptus cullenii +/- Corymbia erythrophloia +/- Terminalia platyptera* woodland on basalt	401	401	100	NC

Photo 121 *Eucalyptus leptophleba* and *Corymbia clarksoniana* woodland on basalt, 3.8.3a, North of Cooktown, CYP.
(EP Addicott)

Photo 122 *Eucalyptus leptophleba* and *Corymbia terminalis* woodland with *Terminalia aridicola* subsp. *chillagoensis* and *Planchonia careya* at the base of a karst limestone outcrop, 9.11.32. Mungana Caves NP, west of Chillagoe, EIU.
(GW Wilson)

12 Dry eucalypt woodlands to open woodlands, mostly on shallow soils in hilly terrain (mainly on sandstone and weathered rocks, land zones 7 and 10)

12a Dry woodlands to open woodlands dominated by ironbarks such as *Eucalyptus decorticans* (gum-topped ironbark), *E. fibrosa* subsp. *nubila* (blue-leaved ironbark), or *E. crebra* (narrow-leaved red ironbark) and/or bloodwoods such as *Corymbia trachyphloia* (yellow bloodwood), *C. leichhardtii* (rustyjacket), *C. watsoniana* (Watson's yellow bloodwood), *C. lamprophylla*, *C. peltata* (yellowjacket). Occasionally *E. thozetiana* (mountain yapunyah), *E. cloeziana* (Gympie messmate) or *E. mediocris* are dominant. Mostly on sub-coastal/inland hills with shallow soils

Pre-clearing area: 2,254,523 ha

Remnant 2017 area: 1,919,409 ha (85.1% of pre-clearing)

Bioregions: BRB (82%), DEU (11%), SEQ (4%), GUP (2%), (EIU 0.5%)

Land zones: 10 (66%), 7 (29%), 9-10 (3%), 12, 11, 5, 4, 9 (minor)

Mean annual rainfall range: 500-1000 mm

Typical landforms: Mainly on sandstone scarps, tablelands and ranges, and lateritic duricrusts

Typical soils: Shallow Rudosols and Tenosols

Structural formation range: Open forest to open woodland

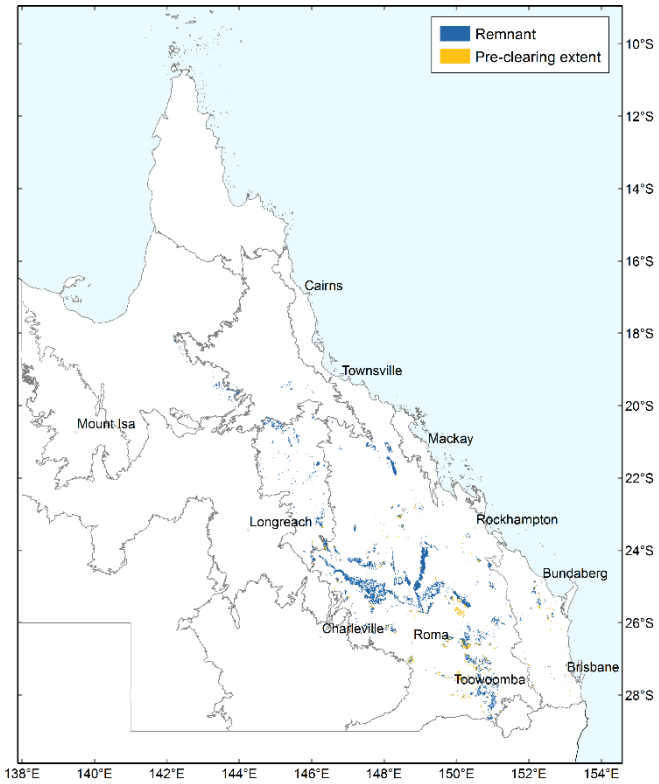


Photo 123 *Eucalyptus crebra* and *E. fibrosa* subsp. *nubila* woodland, 11.10.4. On plateau near Fairview, BRB.
(VJ Neldner)

Floristic characteristics: The canopy is dominated the ironbarks *Eucalyptus decorticans* or *Eucalyptus fibrosa* subsp*. nubila* or other ironbark species or *E. cloeziana.* Bloodwoods such as *Corymbia hendersonii, C. trachyphloia* subsp*. trachyphloia, C. watsoniana*, *Corymbia citriodora* or *C. leichhardtii* may be present as codominant or in some cases dominant species. *Lysicarpus angustifolius* forms a mid-dense subcanopy in some situations. The very sparse shrub layer frequently contains *Cassinia quinquefaria, Acacia macradenia, A. crassa, A. bancroftiorum, Dodonaea lanceolata* var*. subsessilifolia, D. peduncularis* and *Hovea lanceolata*. The ground layer is very sparse and frequently contains the graminoids *Arundinella nepalensis, Aristida contorta, A. personata, A. queenslandica* var*. queenslandica, Entolasia stricta, Leptochloa decipiens, Scleria sphacelata, Panicum effusum, Cleistochloa subjuncea, Digitaria breviglumis,* and *Cymbopogon refractus.* Frequent forbs include *Goodenia rotundifolia, Vittadinia pustulata, Achyranthes aspera, Brunoniella australis, Calotis dentex, Cyanthillium cinereum, Dianella revoluta, Lomandra confertifolia* subsp*. pallida, L. multiflora* subsp*. multiflora, Murdannia graminea, Nyssanthes erecta* and *Pomax umbellata.*

Table 34 Five most extensive regional ecosystems included in BVG 12a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.10.4	*Eucalyptus decorticans, Lysicarpus angustifolius* ± *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp. woodland on coarse-grained sedimentary rocks	442,519	424,291	96	NC
11.10.13a	*Eucalyptus cloeziana* ± *E. melanoleuca* ± *Corymbia bunites* ± *E. sphaerocarpa* woodland to open forest	327,273	321,588	98	NC
11.7.4	*Eucalyptus decorticans* and/or *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust	315,856	195,283	62	NC
11.10.7	*Eucalyptus crebra* woodland on coarse-grained sedimentary rocks	248,680	170,810	69	NC
11.7.7	*Eucalyptus fibrosa* subsp. *nubila* ± *Corymbia* spp. ± *Eucalyptus* spp. woodland on Cainozoic lateritic duricrust	199,330	171,087	86	NC

Photo 124 *Eucalyptus decorticans* woodland with *Acacia shirleyi* subcanopy on residual tops, 11.10.4, North of Mt Moffat, Carnarvon NP, BRB.
(VJ Neldner)

Photo 125 *Eucalyptus fibrosa, Corymbia citriodora, E. crebra* and *E. apothalassica* woodland on small crest, 12.7.1. Woroon SF, SEQ.
(TS Ryan)

12b Woodlands and open woodlands dominated by *Eucalyptus crebra* (narrow-leaved red ironbark) and/or *Corymbia* spp. such as *C. clarksoniana* (grey bloodwood), *C. stockeri*, *C. setosa* (rough leaved bloodwood) or *C. peltata* (yellowjacket) on hilly terrain

Pre-clearing area: 194,951 ha

Remnant 2017 area: 194,420 ha (99.7% of pre-clearing)

Bioregions: GUP (50%), EIU (47%), DEU (2%), CYP (1%), BRB (1%)

Land zones: 7 (44%), 10 (41%), 11 (16%)

Mean annual rainfall range: 800-1000 mm

Typical landforms: Lateritised breakaways and deeply weathered plains and metamorphic hills and mountains

Typical soils: Shallow Rudosols and Tenosols

Structural formation range: Woodland

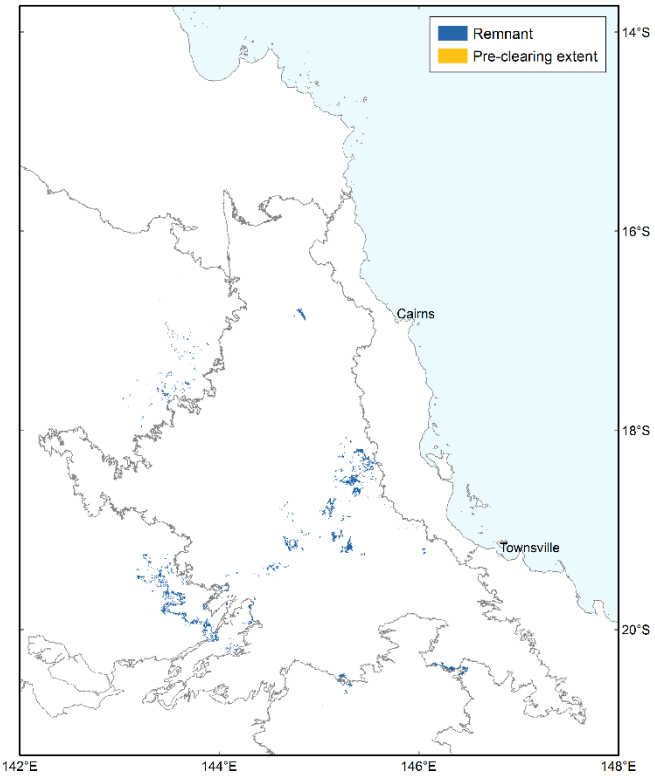


Photo 126 *Eucalyptus whitei, Corymbia serendipita* and *C. setosa* low open woodland with *Triodia* sp., 2.10.4x3. NE of Richmond, GUP.

(CPF Kahler)

Floristic characteristics: *Eucalyptus crebra* or *E. exilipes* or *E. shirleyi* are frequent dominant trees. *Corymbia citriodora, C. trachyphloia, C. peltata* and *C. setosa* are frequently present as co-dominant trees. The very sparse low tree and shrub layer often includes *Petalostigma banksii, Persoonia falcata, Alphitonia excelsa, Coelospermum reticulatum* and *Grevillea glauca*. The mid-dense grass layer is dominated by *Themeda triandra, Aristida* spp., *Heteropogon triticeus, H. contortus, Chrysopogon fallax, Eriachne mucronata, Schizachyrium fragile, Mnesithea rottboellioides* and *Scleria sphacelata. Phyllanthus virgatus, Cyanthillium*

cinereum, Desmodium rhytidophyllum, Hibiscus meraukensis and *Tephrosia filipes* are frequent forbs.

Table 35 Five most extensive regional ecosystems included in BVG 12b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.10.4x3	*Eucalyptus crebra* or *E. whitei* low open woodland on slopes of sandstone ranges	63,736	63,732	100	NC
9.11.17	*Corymbia peltata* ± *Eucalyptus crebra* ± *E. shirleyi* or *E. melanophloia* low open woodland on metamorphic hills and mountains	30,366	30,349	100	NC
2.7.1x5	*Corymbia gilbertensis*, *Acacia meiosperma*, *Cochlospermum gregorii*, *Melaleuca viridiflora*, *A. leptostachya* in mixed woodlands to shrublands on lateritised, Tertiary sandstone hills.	25,758	25,735	100	OC
9.7.3a	*Eucalyptus crebra* ± *Corymbia clarksoniana* woodland on lateritised breakaways	23,995	23,881	100	NC
9.7.5	*Corymbia setosa* and/or *C. peltata* low open woodland on lateritised and deeply weathered surfaces	12,989	12,763	98	NC

Photo 127 *Eucalyptus shirleyi* and *Corymbia peltata* open woodland, 9.11.17, near Lyndhurst, EIU.

(MR Newton)

Photo 128 *Eucalyptus howittiana* woodland with dense ground cover of *Scleria* sp., 9.7.3a, Burdekin River crossing, EIU.

(MR Newton)

13 Dry to moist eucalypt woodlands and open forests, mainly on undulating to hilly terrain of mainly metamorphic and acid igneous rocks, Land zones 11 and 12)

13a Woodlands and open woodlands dominated by ironbarks such as *Eucalyptus cullenii* (Cullen's ironbark), *E. staigeriana* (lemon-scented ironbark) or *E. melanophloia* (silver-leaved ironbark) and bloodwoods such as *Corymbia stockeri* subsp. *peninsularis*, *C. clarksoniana* (grey bloodwood) or *C. leichhardtii* (rustyjacket)

Pre-clearing area: 3,083,673 ha

Remnant 2017 area: 3,058,612 ha (99.2% of pre-clearing)

Bioregions: EIU (83%), CYP (16%), GUP (1%), BRB (0.1%), WET (0.1%)

Land zones: 11 (49%), 12 (46%), 7 (3%), 5 (2%)

Mean annual rainfall range: 800-2000 mm

Typical landforms: Flats, hills and ranges of metamorphic or granitic origin

Typical soils: Yellow or Brown Dermosols, and Yellow or Brown Kandosols

Structural formation range: Woodland to low open woodland

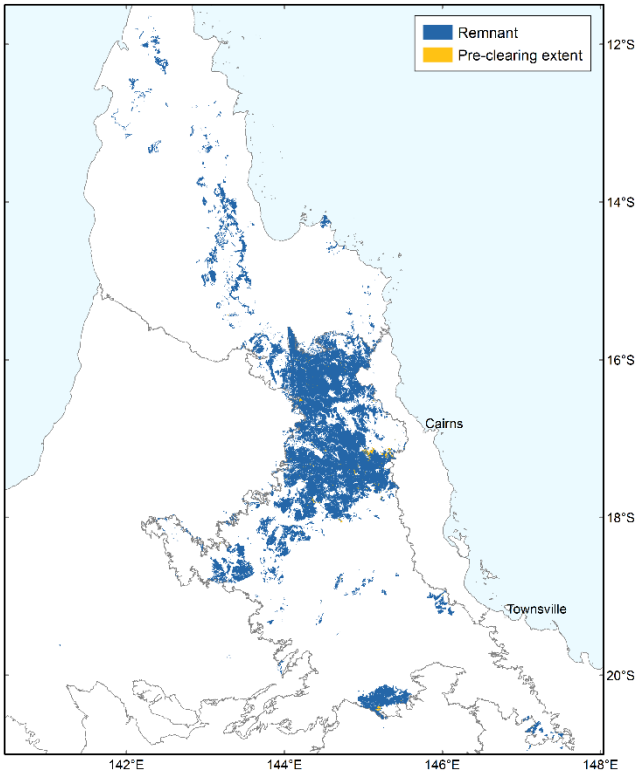


Photo 129 *Eucalyptus cullenii* woodland with sparse *Denhamia cunninghamiana* in the shrub layer, and *Themeda triandra* and *Heteropogon contortus* dominating the ground layer, 9.11.3a. Bellevue Station, EIU. (GW Wilson)

Floristic characteristics: *Eucalyptus cullenii* is the frequent ironbark species, but may be replaced with *E. crebra, E. melanophloia* or rarely *E. staigeriana*. *Corymbia clarksoniana*, *Corymbia erythrophloia, C. stockeri* subsp. *peninsularis*, *C. confertiflora, C. dallachiana* and *Erythrophleum chlorostachys* are frequent co-dominant trees. *Denhamia cunninghamii Petalostigma banksii, P. pubescens, Persoonia falcata, Alphitonia pomaderroides, Erythrophleum chlorostachys, Grevillea glauca, G. parallela, Grewia retusifolia, Xanthorrhoea johnsonii* and *Dolichandrone heterophylla* may be present as very sparse shrubs or low trees. The mid-dense ground layer is dominated by *Heteropogon contortus, H. triticeus, Themeda triandra, Sarga plumosum, Schizachyrium fragile,* and *Aristida* and *Panicum* species. *Evolvulus alsinoides, Cyanthillium cinereum, Indigofera pratensis, Rostellularia adscendens,* and *Spermacoce* and *Cheilanthes* species are most frequent forbs.

Table 36 Five most extensive regional ecosystems included in BVG 13a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.11.3a	*Eucalyptus cullenii* ± *Corymbia clarksoniana* woodland on flats, hills and ranges of metamorphic ranges	640,245	635,414	99	NC
9.12.7a	*Eucalyptus cullenii* ± *Corymbia erythrophloia* woodland on rhyolite hills	542,054	537,933	99	NC
9.12.27	*Eucalyptus melanophloia* and/or *E. shirleyi* ± *Corymbia erythrophloia* low open woodland on igneous rocks	409,437	408,164	100	NC
3.11.7	*Eucalyptus cullenii* and *Corymbia clarksoniana* woodland on low metamorphic hills and rises	235,928	235,567	100	NC
9.11.3b	*Eucalyptus cullenii* ± *Corymbia hylandii* low open woodland on metamorphic hills and ranges	182,742	181,524	99	NC

Photo 130 *Eucalyptus shirleyi* low open woodland with scattered *Erythroxylum ellipticum* and *Petalostigma banksii* in mid-layer, 9.12.27. NE of Gilberton, EIU.
(MR Newton)

Photo 131 *Eucalyptus cullenii* woodland on rolling rises, 3.11.7. North of Pinnacle Creek, CYP.
(MR Newton)

13b Woodlands to open woodlands dominated by *Eucalyptus microneura* (Gilbert River box) on shallow soils on rolling hills

Pre-clearing area: 809,772 ha

Remnant 2017 area: 807,150 ha (99.7% of pre-clearing)

Bioregions: EIU (87%), GUP (13%)

Land zones: 12 (62%), 11 (36%), 9 (2%)

Mean annual rainfall range: 800-1000 mm

Typical landforms: Rolling hills on igneous and metamorphic rocks

Typical soils: Yellow or Brown Dermosols, and Yellow or Brown Kandosols

Structural formation range: Low open woodland to woodland

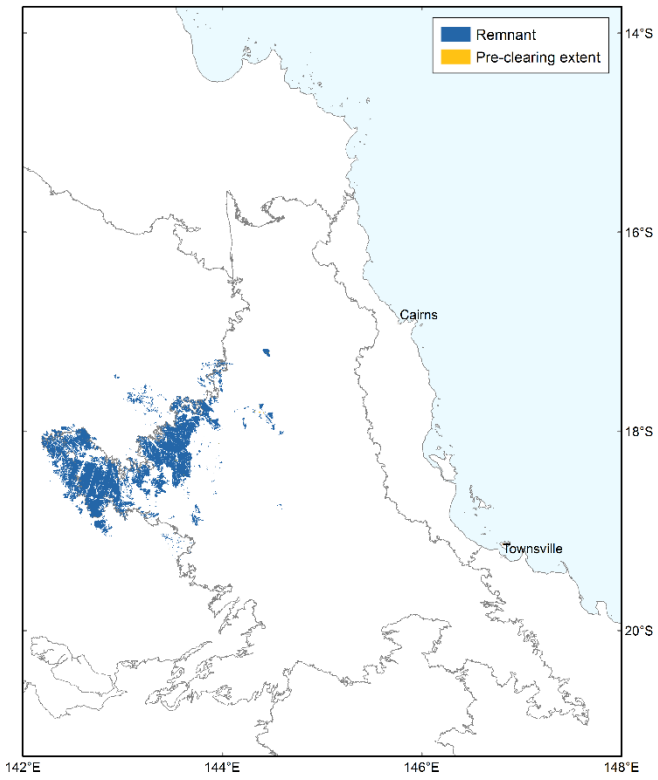


Photo 132 *Eucalyptus microneura* low woodland with shrub layer of *Gardenia vilhelmii* and grassy *Aristida* spp., 9.11.23a. Near Dagworth Station, EIU. (ID Fox)

Floristic characteristics: *Eucalyptus microneura* dominates the sparse low canopy. *Corymbia pocillum* and *Terminalia aridicola* are the most frequent other canopy trees. *Erythrophleum chlorostachys, C. erythrophloia* and *T. platyptera* also occur but less frequently. There is a very sparse shrub layer with *Gardenia vilhelmii, E. microneura, Denhamia cunninghamii, Petalostigma banksii, Carissa lanceolata, Grewia retusifolia, Atalaya hemiglauca, Dolichandrone heterophylla, Vachellia bidwillii, Dodonaea physocarpa* and *Melaleuca citrolens* the most frequent species. The mid-dense grassy ground layer is dominated by *Heteropogon contortus*, *Schizachyrium fragile*, *Capillipedium parviflorum*, *Sarga plumosum*, *Sporobolus australasicus* and *Aristida*, *Enneapogon* and *Eriachne* species. The forbs *Evolvulus alsinoides, Waltheria indica, Polycarpaea corymbosa* and *Indigofera* and *Sida* species are frequent.

Table 37 Five most extensive regional ecosystems included in BVG 13b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.12.33a	*Eucalyptus microneura* ± *Corymbia pocillum* ± *E. melanophloia* low open woodland on rolling hills on igneous rocks	206,649	206,454	100	NC
9.11.23a	*Eucalyptus microneura* ± *Corymbia erythrophloia* or *C. pocillum* ± *Terminalia* spp. ± *Erythrophleum chlorostachys* low open woodland on rolling metamorphic hills	196,069	196,670	100	NC
9.12.6a	*Eucalyptus microneura* ± *Terminalia* spp. ± *Corymbia pocillum* low open woodland on rolling rhyolite or granitic hills	150,716	150,272	100	NC
9.12.6b	*Eucalyptus microneura* ± *Corymbia clarksoniana* low open woodland on granitic or rhyolite hills	81,413	80,403	99	NC
9.12.33c	*Corymbia pocillum +/- Eucalyptus microneura +/- E. chartaboma +/- Erythrophleum chlorostachys* open woodland on outwash from granite or rhyolite hills	49,570	49,462	100	NC

Photo 133 *Petalostigma banksii* tall open shrubland with emergent *Corymbia setosa* and *Eucalyptus microneura*, 9.12.33a. Esmeralda Station, EIU.
(MR Newton)

Photo 134 *Eucalyptus microneura* woodland on slope of low hill, 9.12.6b. Carpentaria Downs, EIU.
(MR Newton)

Photo 135 *Eucalyptus microneura* and *Melaleuca citrolens* low open woodland on rocky low hills, 9.11.24a. Blandcourt Station, EIU.
(ID Fox)

13c Woodlands of *Eucalyptus crebra* (narrow-leaved red ironbark), *E. drepanophylla* (grey ironbark), *E. fibrosa* (dusky-leaved ironbark), *E. shirleyi* (Shirley's silver-leaved ironbark) on granitic and metamorphic ranges

Pre-clearing area: 6,742,949 ha

Remnant 2017 area: 4,706,420 ha (69.8% of pre-clearing)

Bioregions: BRB (49%), EIU (36%), SEQ (8%), NET (4%), CQC (1%), GUP (1%), DEU (0.2%)

Land zones: 12 (51%), 11 (42%), 9 (3%), 9-10 (3%), 5 (0.2%)

Mean annual rainfall range: Majority 600-1200 mm

Typical landforms: Steep to rolling hills and rise on deformed and metamorphosed sediments and interbedded volcanics or igneous rocks

Typical soils: Yellow or Brown Dermosols, and Yellow or Brown Kandosols

Structural formation range: Woodland to open woodland

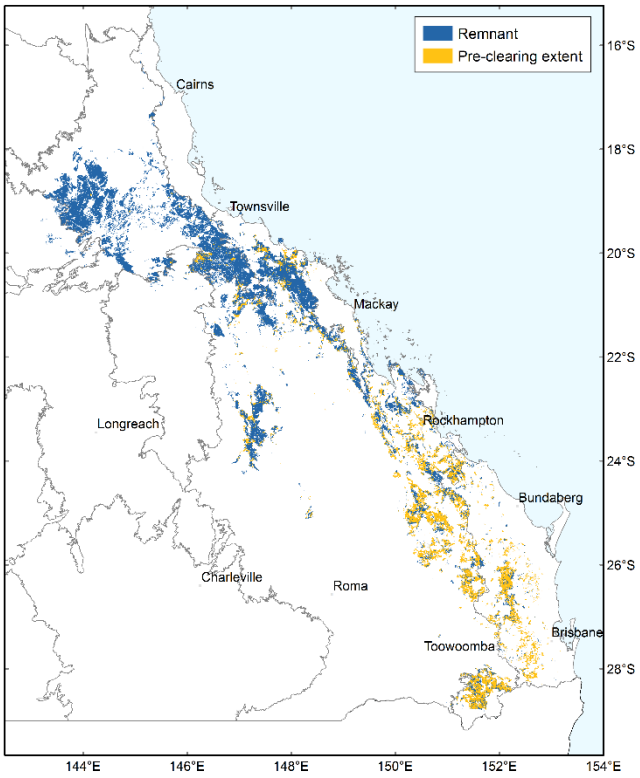


Photo 136 *Eucalyptus crebra, Corymbia tessellaris* and *E. exserta* woodland, 11.12.1. Shoalwater Bay Training Area, BRB. (AL Kelly)

Floristic characteristics: The dominant tree is generally an ironbark which is most frequently *Eucalyptus crebra,* but *E. drepanophylla, E. fibrosa* or *E. shirleyi* may replace it in some areas. *Corymbia erythrophloia, C. dallachiana* or *C. clarksoniana* are frequently codominant trees. Generally only a sparse shrub layer of *Grewia retusifolia* is present. The tussock grasses *Heteropogon contortus, H. triticeus, Themeda triandra, Sarga plumosum* and *Chrysopogon fallax* dominate the dense ground layer, with frequent forbs including *Evolvulus alsinoides, Spermacoce brachystema, Cyanthillium cinereum, Indigofera pratensis* and *Phyllanthus virgatus.*

Table 38 Five most extensive regional ecosystems included in BVG 13c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.12.1	*Eucalyptus crebra* woodland on igneous rocks	1,350,335	811,149	60	NC
11.11.15	*Eucalyptus crebra* woodland on deformed and metamorphosed sediments and interbedded volcanics	817,001	462,716	57	NC
9.12.1a	*Eucalyptus crebra* ± *Corymbia* spp. woodland on igneous rocks	713,310	676,268	95	NC
9.11.2a	*Eucalyptus crebra* ± *Corymbia dallachiana* ± *C. erythrophloia* woodland on metamorphic hills	317,871	311,185	98	NC
9.11.16	*Eucalyptus crebra* ± *Corymbia erythrophloia* or *C. pocillum* woodland on steep to rolling hills	313,569	313,082	100	NC

Photo 137 *Eucalyptus crebra* woodland, with occasional *Corymbia dallachiana* and *C. erythrophloia*, 9.11.2a. Pandanus Station, EIU.
(RM Lovatt)

Photo 138 *Eucalyptus crebra* and *Corymbia erythrophloia* woodland, 11.11.15c. Shoalwater Bay Training Area, BRB.
(AL Kelly)

Photo 139 *Eucalyptus crebra* and *Corymbia erythrophloia* woodland, 11.12.7. Near Collinsville, BRB.
(A Borsboom)

Photo 140 *Eucalyptus shirleyi* low open woodland with *Acacia umbellata* dominated shrub layer, 11.11.8, Burdekin Falls Dam, BRB. (A Borsboom)

13d Woodlands dominated by *Eucalyptus moluccana* (gum-topped box) (or *E. microcarpa* (inland grey box)) on a range of substrates

Pre-clearing area: 749,151 ha

Remnant 2017 area: 352,742 ha (47.1% of pre-clearing)

Bioregions: BRB (61%), SEQ (32%), EIU (6%), CQC (0.6%), NET (0.2%), WET (0.1%)

Land zones: 5 (35%), 3 (20%), 11 (13%), 9-10 (13%), 9 (9%), 12 (9%), 8 (1%)

Mean annual rainfall range: 800-1200 mm

Typical landforms: Cainozoic sand plains to Tertiary plains and alluvial plains. Also on fine grained sedimentary rocks and metamorphic and igneous rocks

Typical soils: A wide variety of soils depending on landscape position

Structural formation range: Open forest to woodland

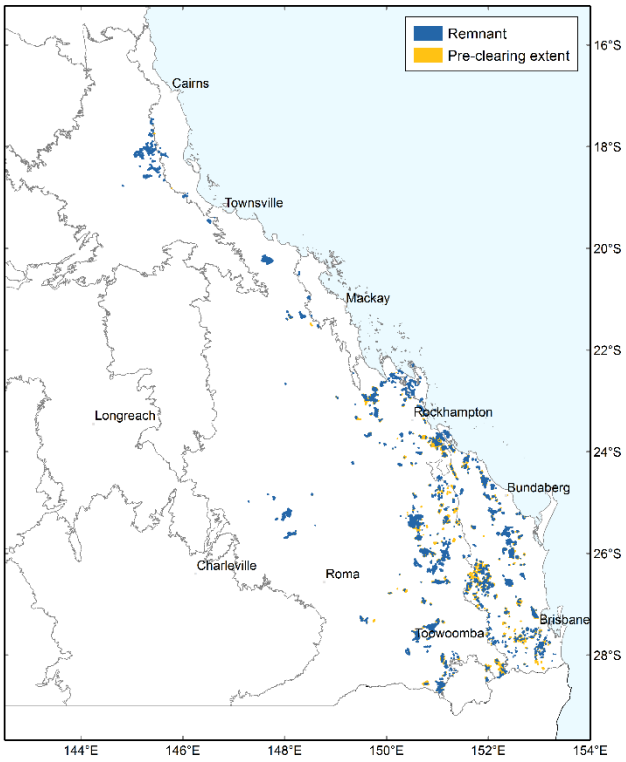


Photo 141 *Eucalyptus moluccana* open forest, 11.3.26. Shoalwater Bay Training Area, BRB.

(VJ Neldner)

Floristic characteristics: *Eucalyptus moluccana* usually dominates the canopy. It is sometimes replaced by *E. woollsiana* or *E. microcarpa* in the west. Co-dominant trees are uncommon, but are occasionally include *E. crebra* and *E. tereticornis. Alphitonia excelsa, Acacia disparrima* subsp*. disparrima* and *A. leiocalyx* occur as infrequent shrubs and low trees.

The mid-dense ground layer is dominated by the graminoids *Cymbopogon refractus, Fimbristylis dichotoma, Cyperus gracilis, Eragrostis brownii, Paspalidium distans, Themeda triandra, Heteropogon contortus, Eremochloa bimaculata, Panicum effusum, Gahnia aspera* and *Arundinella nepalensis. Brunoniella australis, Cyanthillium cinereum, Eremophila debilis, Phyllanthus virgatus, Eustrephus latifolius, Rostellularia adscendens, Cheilanthes sieberi, Glycine tabacina* and *Murdannia graminea* are frequent forbs.

The Swamp Tea-tree (*Melaleuca irbyana*) Forest of Southeast Queensland which is listed as critically endangered under the *EPBC Act* includes RE 12.3.19 from this BVG.

Table 39 Five most extensive regional ecosystems included in BVG 13d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.5.20	*Eucalyptus moluccana* and/or *E. microcarpa*/ *E. woollsiana* ± *E. crebra* woodland on Cainozoic sand plains	228,908	149,945	66	NC
11.3.26	*Eucalyptus moluccana* or *E. microcarpa* woodland to open forest on margins of alluvial plains	121,298	44,280	36	NC
12.9-10.3	*Eucalyptus moluccana* open forest on sedimentary rocks	94,806	26,976	28	OC
11.9.13	*Eucalyptus moluccana* or *E. microcarpa* open forest on fine grained sedimentary rocks	65,331	20,184	31	OC
12.11.18	*Eucalyptus moluccana* woodland on metamorphics ± interbedded volcanics	59,325	24,330	41	NC

Photo 143 *Eucalyptus molucanna* woodland, 12.11.18. Wondai SF, SEQ. (TS Ryan)

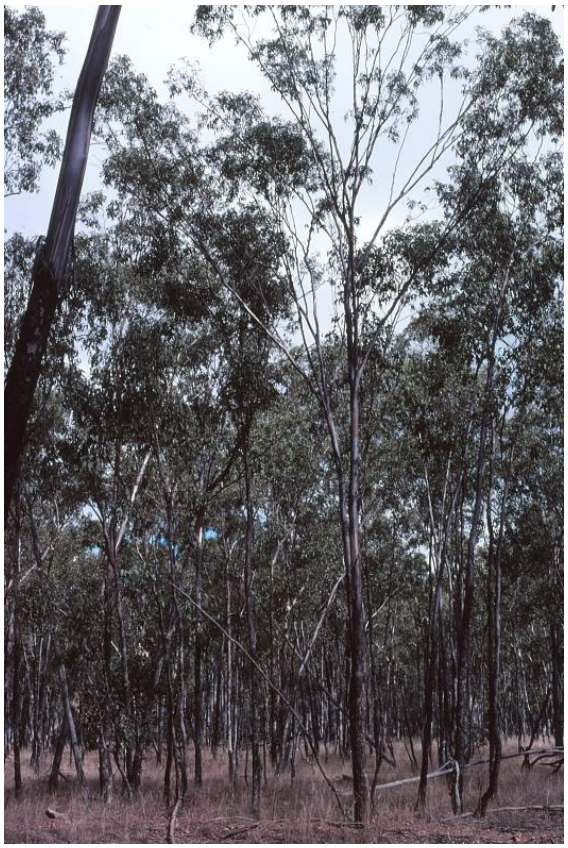


Photo 142 *Eucalyptus microcarpa* woodland, 11.9.13, Near Mitchell, BRB. (VJ Neldner)

14 Woodlands and tall woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala*), and/or *Corymbia nesophila* (Melville Island bloodwood) and/or *E. phoenicea* (scarlet gum)

14a Woodlands and tall woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala*), with *Corymbia nesophila* (Melville Island bloodwood). Occasionally *E. chartaboma* (or *E. miniata* (Darwin woollybutt)), on deeply weathered plateaus and remnants

Pre-clearing area: 2,645,831 ha

Remnant 2017 area: 2,607,761 ha (98.6% of pre-clearing)

Bioregions: CYP (80%), GUP (20%), NWH (0.2%)

Land zones: 5 (98%), 7 (2%), 10 (0.05%)

Mean annual rainfall range: Mainly 1000-1600 mm

Typical landforms: Deeply weathered plateaus and remnants, gently undulating rises, and lower slopes of rises.

Typical soils: Yellow Kandosols and Yellow Dermosols

Structural formation range: Woodland to tall woodland

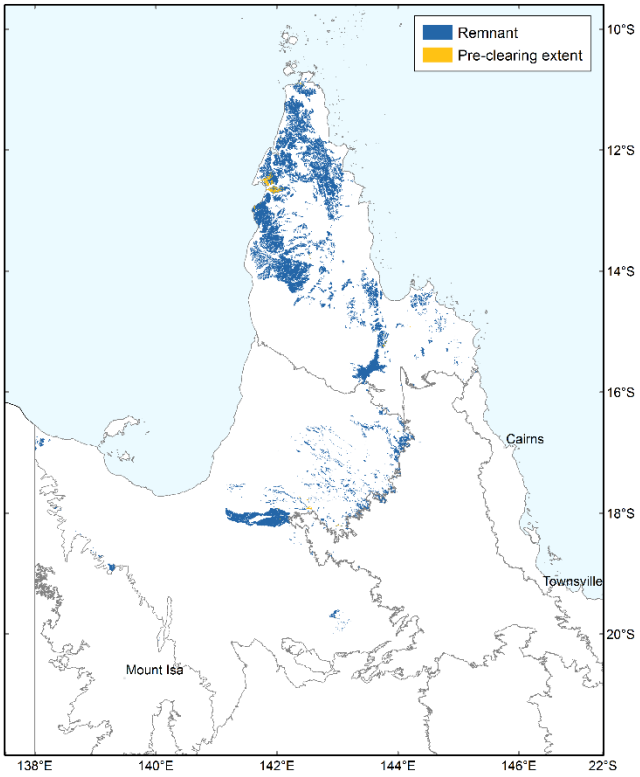


Photo 144 *Eucalyptus tetrodonta, E. crebra* and *Corymbia stockeri* subsp. *peninsularis* tall woodland on a Tertiary plateau, 3.5.37b, Near Kimba, CYP. (MR Newton)

Photo 145 *Eucalyptus tetrodonta* and *Corymbia nesophila* tall woodland, 3.5.36b. East of Weipa, CYP. (VJ Neldner)

Floristic characteristics: *Eucalyptus tetrodonta* or *E. megasepala* dominate the sparse canopy. *Corymbia nesophila* and less frequently *C. stockeri* subsp. *peninsularis* or *C. clarksoniana* are co-dominant in the canopy. *Erythrophleum chlorostachys* is often present forming a subcanopy layer. *Grevillea glauca, G. parallela, E. chlorostachys, Eucalyptus tetrodonta, Parinari nonda* and *Acacia rothii* are frequently present as low trees. In addition to these species, *Coelospermum reticulatum, Persoonia falcata, Xylomelum scottianum, Planchonella pohlmaniana, Alphitonia pomaderroides, Croton arnhemicus, Morinda reticulata, Petalostigma pubescens, Grewia retusifolia, Hibbertia candicans, Acacia crassicarpa, A. calyculata, A. flavescens, Neofabricia myrtifolia, Indigofera pratensis* and *Pandanus* species are frequently present in the sparse shrub layer. The mid-dense ground layer is dominated by the grasses *Heteropogon triticeus, Sarga plumosum, Alloteropsis semialata, Eulalia mackinlayi* and *Aristida, Thaumastochloa, Panicum, Eriachne* and *Eragrostis* species. Frequent forbs are *Phyllanthus virgatus, Euphorbia mitchelliana* var. *mitchelliana, Schelhammera multiflora, Crotalaria medicaginea, Flemingia parviflora, Spermacoce laevigata* and *Lomandra* and *Helicteres* species.

Table 40 Five most extensive regional ecosystems included in BVG 14a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.5.36a	*Eucalyptus tetrodonta and Corymbia nesophila* woodland on undulating and eroded Tertiary plains	1,002,741	1,000,886	100	NC
3.5.36b	*Eucalyptus tetrodonta and Corymbia nesophila* woodland to open forest on Tertiary plateaus.	751,643	720,136	96	NC
2.5.5a	*Eucalyptus tetrodonta*, *Corymbia polycarpa*, *Erythrophleum chlorostachys* and *C. pocillum* in mixed woodlands on sandy rises and abandoned levees on Tertiary sand sheets.	297,546	293,935	99	NC
3.5.35	*Eucalyptus tetrodonta and Corymbia nesophila* woodland with heathy understory on sand plains.	222,367	222,314	100	NC
3.5.37b	*Eucalyptus tetrodonta +/- Erythrophleum chlorostachys +/- Corymbia stockeri* tall woodland on massive soils on Tertiary plateaus.	118,004	117,627	100	NC

Photo 146 *Eucalyptus tetrodonta* and *Corymbia pocillum* woodland on a Tertiary sand sheet, 2.5.5a. Strathmore Station, GUP.
(CN Appelman)

Photo 147 *Eucalyptus tetrodonta* and *Erythrophleum chlorostachys* woodland. 3.5.39. North of the Kennedy River, CYP.
(MR Newton)

14b Woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala*) or *E. chartaboma* or *E. miniata* (Darwin woollybutt), with *Corymbia clarksoniana* (grey bloodwood) on erosional surfaces, residual sands and occasionally alluvial plains

Pre-clearing area: 3,275,897 ha

Remnant 2017 area: 3,268,313 ha (99.8% of pre-clearing)

Bioregions: CYP (76%), GUP (22%), EIU (1.4%), NWH (0.6%), DEU (0.1%)

Land zones: 5 (88%), 3 (5%), 7 (4%), 2 (1%), 10 (1%),

Mean annual rainfall range: 800-1600 mm

Typical landforms: On undulating Tertiary sand plains and erosional plains, through to sandy outwash deposits. Also occurs on ironstone knolls, slopes and plateaus and stabilized coastal dunes and coastal plains.

Typical soils: Redoxic Hydrosols, Red and Yellow Hydrosols

Structural formation range: Woodland to open woodland

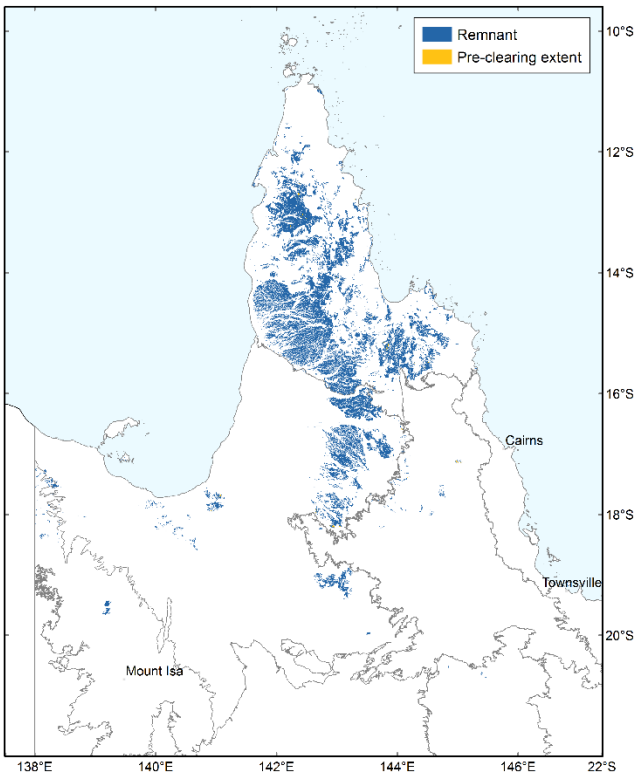


Photo 148 *Eucalyptus tetrodonta* and *Corymbia stockeri* subsp. *peninsularis* woodland on deep red soil, 3.5.9. North of Alice River crossing on Oriners station, CYP. (MJ Spry, DNRM)

Floristic characteristics: *Eucalyptus tetrodonta* or *E. megasepala* dominate the sparse canopy. *Corymbia stockeri* subsp. *peninsularis* or *C. clarksoniana* are frequently co-dominant in the canopy, with *C. nesophila, C. pocillum, C. polycarpa* and *C. setosa* occurring less often. *Erythrophleum chlorostachys* is often present forming a subcanopy layer. *Grevillea glauca, G. parallela, E. chlorostachys, Eucalyptus tetrodonta, Melaleuca viridiflora, M. nervosa, Petalostigma pubescens, P. banksii, Parinari nonda, Alphitonia pomaderroides* and *Acacia rothii* are frequently present as low trees. In addition to these species, *Planchonia careya, Coelospermum reticulatum, Persoonia falcata, Xylomelum scottianum, Planchonella pohlmaniana, Croton arnhemicus, Grewia retusifolia, Acacia crassicarpa, Hibiscus*

meraukensis, Xanthorrhoea johnsonii, Adenanthera abrosperma and *Melaleuca stenostachya,* are frequently present in the very sparse shrub layer. The mid-dense ground layer is dominated by the grasses *Schizachyrium fragile, Heteropogon triticeus, H. contortus, Sarga plumosum, Alloteropsis semialata, Setaria surgens, Mnesithea formosa, Ectrosia leporina, Schoenus sparteus* and *Aristida, Thaumastochloa, Panicum, Eriachne, Digitaria, Scleria* and *Eragrostis* species. Frequent forbs are *Phyllanthus virgatus, Crotalaria medicaginea, C. montana, Flemingia parviflora, Drosera petiolaris* and *Spermacoce, Lomandra, Striga, Polygala, Desmodium, Heliotropium, Tephrosia* and *Helicteres* species.

Table 41 Five most extensive regional ecosystems included in BVG 14b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.5.39	*Eucalyptus tetrodonta* +/- *Corymbia clarksoniana* woodland on sand plains.	966,703	963,182	99	NC
3.5.9	*Eucalyptus tetrodonta, Corymbia stockeri* +/- *C. setosa* woodland on sand plains	534,839	534,637	100	NC
3.5.37a	*Eucalyptus tetrodonta* and *Corymbia stockeri* woodland on erosional plains.	476,290	476,087	100	NC
2.5.6a	*Eucalyptus tetrodonta, Corymbia pocillum, Erythrophleum chlorostachys* and *C. polycarpa* in mixed woodlands on undulating Tertiary sand sheets	462,004	460,845	100	NC
3.5.38	*Eucalyptus tetrodonta* +/- *E. cullenii, Corymbia stockeri* and *Melaleuca* spp. woodland on remnant surfaces	166,640	166,542	100	NC

Photo 149 *Corymbia pocillum, C. polycarpa, Eucalyptus tetrodonta* and *Erythrophleum chlorostachys* woodland on a sand plain, 2.5.6a. Near Gamboola Station, GUP.
(GW Wilson)

Photo 150 *Eucalyptus tetrodonta, Erythrophleum chlorostachys* and *Corymbia polycarpa* woodland on a residual Tertiary sand sheet, 2.5.6a. North of Georgetown, GUP.
(CN Appelman)

14c Open forests and woodlands dominated by *Corymbia nesophila* (Melville Island bloodwood) usually with *Eucalyptus tetrodonta* (Darwin stringybark) or *E. phoenicea* (scarlet gum)

Pre-clearing area: 203,069 ha

Remnant 2017 area: 201,885 ha (99.4% of pre-clearing)

Bioregions: CYP (80%), WET (16%), EIU (4%)

Land zones: 11 (48%), 5 (20%), 12 (19%), 10 (8%), 3 (5%), 2 (0.3%)

Mean annual rainfall range: 1600 - >3000 mm

Typical landforms: On metamorphic ranges, hills and foothills; also on sandy colluvia and plains

Typical soils: Yellow Kandosols, and Yellow or Brown Dermosols

Structural formation range: Woodland

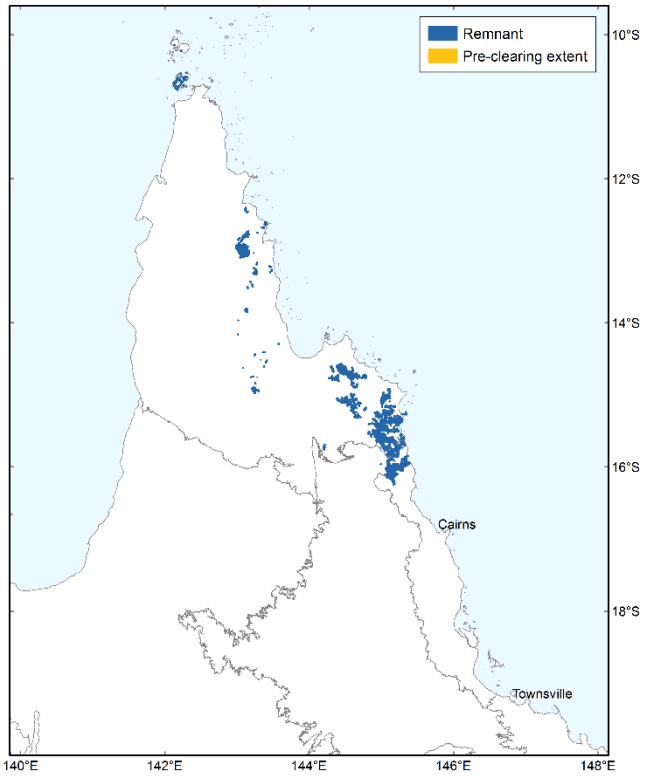


Photo 151 *Corymbia nesophila* woodland on footslopes of metamorphic hill, 3.11.13. Near Hopevale on road to Elim Sands, CYP. (MR Newton)

Floristic characteristics: *Corymbia nesophila* dominates woodlands on the metamorphic ranges, but also on some stabilised dunes and sandy colluvia. *Eucalyptus phoenicea* dominates woodlands on sandstone ranges, sandy colluvia and some coastal dunes. *Erythrophleum chlorostachys, Eucalyptus brassiana, Eucalyptus tetrodonta* and *Corymbia clarksoniana* are sometimes present as co-dominant trees. *Grevillea glauca, Acacia flavescens, A. crassicarpa, Melaleuca nervosa* and *Parinari nonda* are additional species that are frequent in the very sparse low tree layer. Additional species that are frequent in the sparse shrub layer are *Persoonia falcata, Coelospermum reticulatum, Petalostigma pubescens, Planchonia careya, Acacia calyculata, A. leptocarpa, Alphitonia pomaderroides* and *Alyxia spicata.* The sparse ground layer is dominated by the grasses *Eriachne pallescens, Themeda*

triandra, Heteropogon triticeus, Alloteropsis semialata, Eremochloa bimaculata, Mnesithea rottboellioides, Sarga plumosum and species of *Aristida, Schizachyrium, Panicum, Scleria, Digitaria* and *Thaumastochloa.*

Table 42 Five most extensive regional ecosystems included in BVG 14c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.11.13	*Corymbia nesophila* ± *E. brassiana* woodland on metamorphic hills and ranges	61,699	61,393	100	NC
3.5.6	*Eucalyptus phoenicea* woodland on sandy outwash plains	40,054	40,054	100	NC
3.12.40	*Corymbia nesophila +/- Eucalyptus tetrodonta* woodlands on igneous hills and rises	36,669	36,545	100	NC
7.11.20	*Corymbia nesophila, Corymbia clarksoniana, Eucalyptus platyphylla*, open woodland to open forest on gently sloping metamorphic lowlands and foothills	28,269	28,179	100	NC
3.10.7	*Eucalyptus phoenicea* on wetter sandstone	12,628	12,628	100	NC

Photo 152 *Eucalyptus phoenicea* and *E .tetrodonta* woodland on rises, 3.5.6. Near Old Laura Homestead on Battlecamp Rd, CYP. (MR Newton)

Photo 153 *Corymbia nesophila* and *C. tessellaris* open forest, 7.11.20. South of Shiptons Flat, WET. (JR Clarkson)

Photo 154 *Eucalyptus tetrodonta* and *Corymbia stockeri* subsp. *stockeri* woodland, 3.10.21a, Kalpowar, CYP. (MR Newton)

Photo 155 *Corymbia clarksoniana* and *C. nesophila* woodland with midlayer of *Livistona muelleri*, 3.3.27a. North of Cooktown, CYP. (MR Newton)

14d Woodlands dominated by *Corymbia stockeri* (or *C. hylandii*) and *Eucalyptus megasepala* (or *E. tetrodonta* (Darwin stringybark)) on sandstone, metamorphic and ironstone ranges

Pre-clearing area: 1,267,107 ha

Remnant 2017 area: 1,265,010 ha (99.8% of pre-clearing)

Bioregions: CYP (82%), GUP (11%), EIU (7%), DEU (0.5%)

Land zones: 10 (41%), 11 (30%), 12 (24%), 7 (5%), 9 (0.5%)

Mean annual rainfall range: 800-2000 mm

Typical landforms: Plateaus, ranges and hills of sandstone, metamorphic or granitic origin

Typical soils: Bleached-leptic Tenosols and Yellow Kandosols

Structural formation range: Woodland

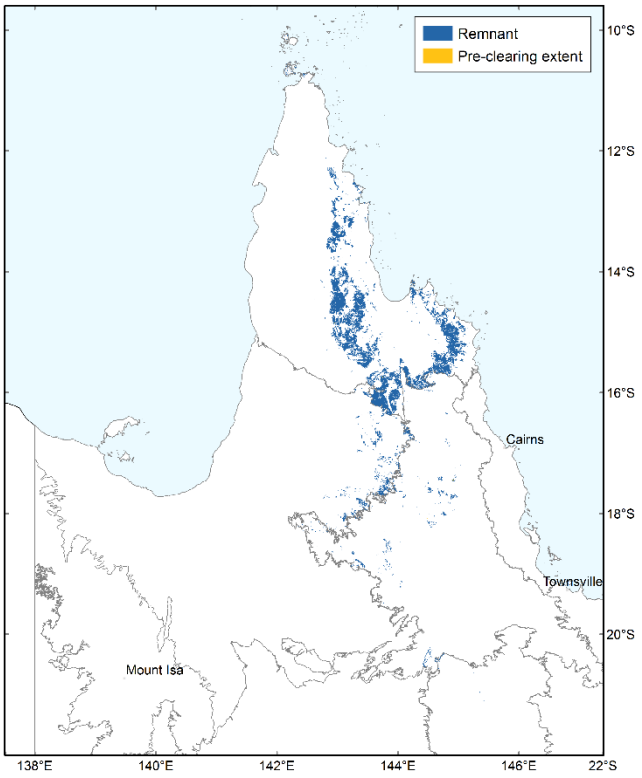


Photo 156 *Corymbia stockeri* subsp. *stockeri* and *Eucalyptus tetrodonta* woodland on sandstone hills, 3.10.6a. West of the Normanby River on Battlecamp Road, CYP. (MR Newton)

Floristic characteristics: *Corymbia stockeri* subsp. *stockeri* and *Eucalyptus tetrodonta* or *E. megasepala* dominate the sparse canopy. *Corymbia stockeri* subsp. *peninsularis* or *E. cullenii* are frequently present in the canopy. *Erythrophleum chlorostachys* is often present forming a subcanopy layer. *Grevillea glauca, G. parallela, Melaleuca stenostachya, E. chlorostachys, Melaleuca viridiflora, Petalostigma banksii, Cochlospermum gillivraei* and *Acacia rothii* are

frequently present as low trees. In addition to these species, *Indigofera pratensis, Persoonia falcata, Acacia calyculata, A. humifusa, Alphitonia pomaderroides, Grevillea dryandri, Planchonia careya, Xanthorrhoea johnsonii, Erythroxylum ellipticum* and *Gompholobium pinnatum* are frequently present in the very sparse shrub layer. The sparse ground layer may be dominated by *Triodia microstachya* or the tussock grasses *Schizachyrium fragile, Heteropogon triticeus, Sarga plumosum, Alloteropsis semialata,* and *Aristida, Thaumastochloa, Panicum, Eriachne* and *Eragrostis* species. Frequent forbs are *Phyllanthus virgatus, P. carpentariae, Crotalaria medicaginea, C. montana, Haemodorum coccineum, Drosera petiolaris* and *Spermacoce, Lomandra, Desmodium, Heliotropium, Tephrosia* species.

Table 43 Five most extensive regional ecosystems included in BVG 14d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.10.6	*Eucalyptus tetrodonta* ± *Corymbia stockeri* subsp. *stockeri* woodland on sandstone plateaus	386,328	386,221	100	NC
3.11.11	*Corymbia stockeri* ± *Eucalyptus tetrodonta* woodland on hills and erosional surfaces.	377,455	376,997	100	NC
3.12.42	*Eucalyptus tetrodonta* woodland on low to undulating granite hills	244,265	243,827	100	NC
2.10.2x3a	*Eucalyptus tetrodonta* and/or *E. chartaboma* +/- *Erythrophleum chlorostachys* +/- *Corymbia pocillum* woodland in sandstone ranges	72,948	72,944	100	NC
2.7.2x2a	*Eucalyptus megasepala, E. cullenii* +/- *Corymbia pocillum, Eucalyptus tetrodonta, Erythrophleum chlorostachys* woodland on mudstone hills	32,305	32,301	100	NC

Photo 157 *Corymbia stockeri* subsp. *peninsularis* and *Eucalyptus cullenii* woodland on low hill. 3.11.11. On road to Lockhart River, CYP. (MR Newton)

Photo 158 *Eucalyptus tetrodonta* and *Corymbia clarksoniana* open woodland, 3.12.42. South of the Palmer River, CYP. (MR Newton)

15 Temperate eucalypt woodlands

15a Woodlands and open forests dominated by *Eucalyptus youmanii* (Youman's stringybark), *E. scoparia* (Wallangarra white gum), *E. caliginosa* (broad-leaved stringybark) or *E. melliodora* (yellow box) occurring on traprock

Pre-clearing area: 345,984 ha

Remnant 2017 area: 150,010 ha (43.4% of pre-clearing)

Bioregions: NET (88%), BRB (12%)

Land zones: 11 (49%), 12 (40%), 9 (11%)

Mean annual rainfall range: 800-1000 mm

Typical landforms: On metamorphic ranges and hills

Typical soils: Gravelly Rudosols and Tenosols, through to Chromosols and Sodosols on the flats

Structural formation range: Woodland to open forest

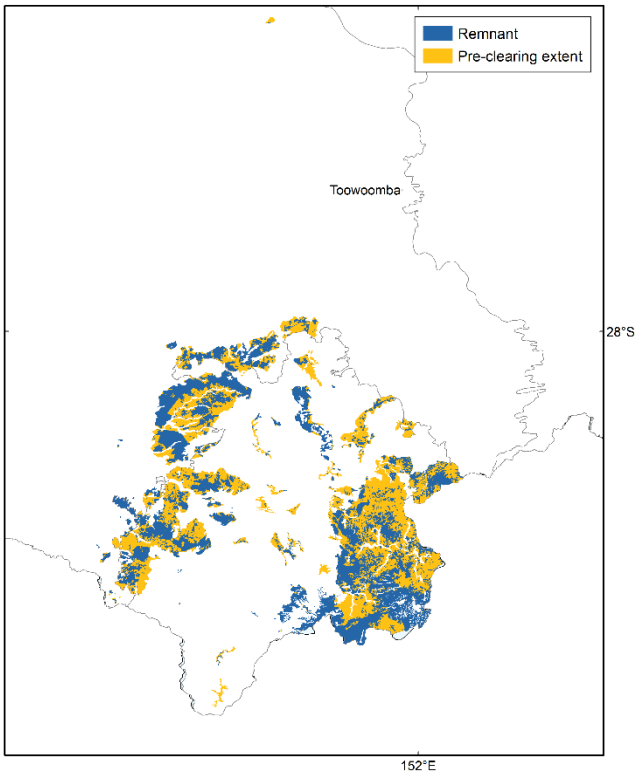


Photo 159 *Eucalyptus andrewsii, E. prava* and *Acacia adunca* woodland with heathy understorey. *E. scoparia* in rock crevice, 13.12.3. View to Mt Norman from Mallee ridge, Girraween NP, NET.
(MT Mathieson)

Floristic characteristics: These woodlands tend to be dominated by a variety of single species including *Eucalyptus youmanii*, *E. melliodora, E. scoparia, E. caleyi, E. dealbata, E. moluccana, E crebra, E. fibrosa* or *E. sideroxylon. Callitris endlicheri, C. glaucophylla* and *Allocasuarina luehmannii* are frequently present in a very sparse low tree layer. Frequent shrub species include *Olearia elliptica, Cassinia laevis, Melichrus urceolatus, Psydrax odorata, Acacia crassa, A. deanei, Acacia leiocalyx, A. semilunata, Melaleuca decora* and *Dodonaea viscosa* subsp. *spatulata.* The ground layer is dominated by the graminoids, *Aristida vagans, A. caput-medusae, A. gracilipes, A. ramosa, A. leichhardtiana, Cymbopogon refractus,*

Panicum effusum, Gahnia aspera, Cyperus gracilis, Entolasia stricta and *Enteropogon acicularis.* Frequent forbs include *Cheilanthes sieberi, C. distans, Lomandra filiformis, L. longifolia, L. multiflora* subsp*. multiflora, Brunoniella australis, Dianella revoluta, Pomax umbellata, Cyanthillium cinereum, Glycine tabacina.*

Table 44 Five most extensive regional ecosystems included in BVG 15a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
13.11.8	*Eucalyptus melliodora* and/or *Eucalyptus moluccana* woodland on metamorphics	85,221	22,271	26	E
13.11.3b	*Eucalyptus caleyi* woodland	42,907	20,635	48	OC
11.9.9a	*Eucalyptus albens* ± *E. crebra* ± *E. tereticornis* ± *Callitris baileyi*	36,346	20,345	56	NC
13.12.2	*Eucalyptus andrewsii*, *E. youmanii* woodland on igneous rocks	32,020	22,109	69	NC
13.12.8	*Eucalyptus melliodora* and/or *E. moluccana* and/or *E. conica* woodland on igneous rocks	25,366	4,350	17	E

The White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland which is listed as critically endangered under the *EPBC Act* includes regional ecosystems 11.9.9a, 13.11.3, 13.11.8 and 13.12.9 from this BVG.

Photo 160 *Eucalyptus mellidora* with *Angophora floribunda* open forest with sparse shrub layer and grassy understorey. 13.12.8. Pike Creek Station, west of Stanthorpe, NET. (AL Kelly)

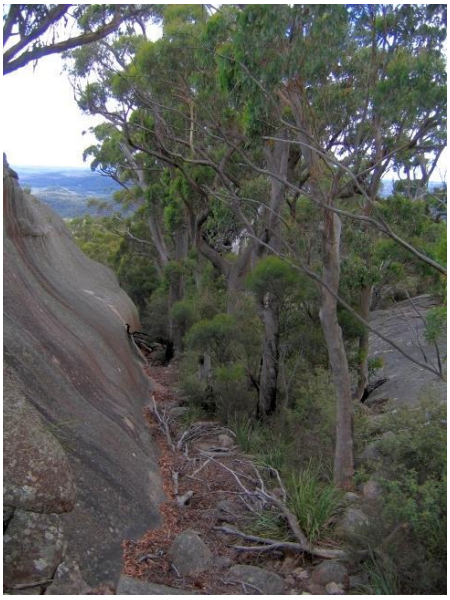


Photo 162 *Eucalyptus andrewsii, E. youmanii* woodland, 13.12.3, Mallee Ridge gully, Girraween NP, NET. (MT Mathieson)

Photo 161 *Eucalyptus andrewsii* with *Callitris endlicheri* woodland, 13.12.2. Near Castle Rock. Girraween NP, NET. (MT Mathieson)

15b Woodlands dominated by *Eucalyptus conica* (fuzzy box) or *E. nova-anglica* (New England peppermint) or *E. blakelyi* (Blakely's red gum) on alluvial plains

Pre-clearing area: 46,722 ha

Remnant 2017 area: 6,986 ha
(15.0% of pre-clearing)

Bioregions: NET (85%), BRB (15%)

Land zones: 3 (100%)

Mean annual rainfall range:
800-1000 mm

Typical landforms: Alluvial plains

Typical soils: Rudosols and Tenosols

Structural formation range: Woodland

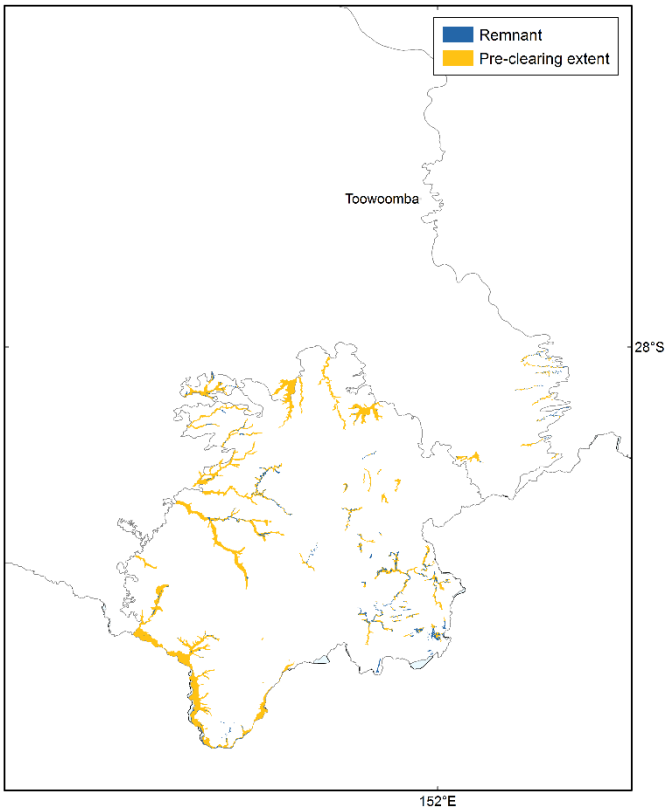


Photo 163 *Eucalyptus mellidora* and *E. moluccana* open forest with *E. blakelyi* and *E. conica* and a sparse shrub layer and a grassy understorey, 13.3.4. Reserve on the corner of Mt Janet and Pikedale Roads, Goldfields, NET.
(AL Kelly).

Floristic characteristics: *Eucalyptus conica, E. nova-anglica* or *E. blakelyi* dominate the woodland at a site. *E. moluccana, Angophora floribunda, Callitris glaucophylla, E. melliodora* and *E. nobilis* are sometimes present as scattered trees. *Maireana microphylla* and *Geijera*

parviflora occur as very scattered shrubs. The ground layer is dominated by *Aristida ramosa, A. vagans, Arundinella nepalensis, Austrostipa verticillata, Cymbopogon refractus, Cyperus fulvus, C. gracilis, Enneapogon gracilis* and *Eragrostis species.* The most frequent forbs are *Brunoniella australis, Cheilanthes distans, C. sieberi, Einadia nutans, Eremophila debilis, Evolvulus alsinoides, Lomandra filiformis, Rostellularia adscendens* and *Wahlenbergia gracilis.*

Table 45 The four regional ecosystems making up BVG 15b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
13.3.4	*Eucalyptus conica, E. moluccana, E. melliodora* woodland on alluvial plains	37,371	3,206	9	E
13.3.1	*Eucalyptus blakelyi* woodland on alluvial plains	6,731	2,804	42	E
11.3.23	*Eucalyptus conica, E. nobilis, E. tereticornis*, *Angophora floribunda* on alluvial plains. Basalt derived soils	1,943	664	34	E
13.3.2	*Eucalyptus nova-anglica* open forest on alluvial plains	676	312	46	E

The White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland which is listed as critically endangered under the *EPBC Act* includes regional ecosystems 11.3.23, 13.3.1 and 13.3.4 from this BVG. RE13.3.2 forms part of the critically endangered New England Peppermint Grassy Woodlands.

Photo 164 *Eucalyptus conica* and *E. melliodora* open forest with a mid-dense shrub layer and a grassy understorey, 11.3.23. Boundary of Puntdaloo Nature Refuge and Main Range NP, BRB.

(AL Kelly)

Photo 165 *Eucalyptus bridgesiana* open forest,13.3.1. Paling Yard Creek road, east of Dr Roberts Waterhole, Girraween NP, NET.

(MT Mathieson)

16 *Eucalyptus* spp. dominated open forest and woodlands drainage lines and alluvial plains

16a Open forests and woodlands dominated by *Eucalyptus camaldulensis* (river red gum) (or *E. tereticornis* (blue gum)) and/or *E. coolabah* (coolibah) (or *E. microtheca* (coolabah)) fringing drainage lines. Associated species may include *Melaleuca* spp., *Corymbia tessellaris* (carbeen), *Angophora* spp., *Casuarina cunninghamiana* (river she-oak). Does not include alluvial areas dominated by herblands or grasslands or alluvial plains that are not flooded

Pre-clearing area: 3,990,005 ha

Remnant 2017 area: 3,564,088 ha (89.3% of pre-clearing)

Bioregions: MGD (27%), BRB (18%), CHC (15%), GUP (15%), MUL (8%), DEU (5%), NWH (4%), EIU (3%), SEQ (3%), NET, WET, CYP (minor)

Land zones: 3 (100%)

Mean annual rainfall range: 200-1600 mm

Typical landforms: Fringing drainage lines on alluvial plains

Typical soils: Rudosols and Tenosols

Structural formation range: Open forest to woodland

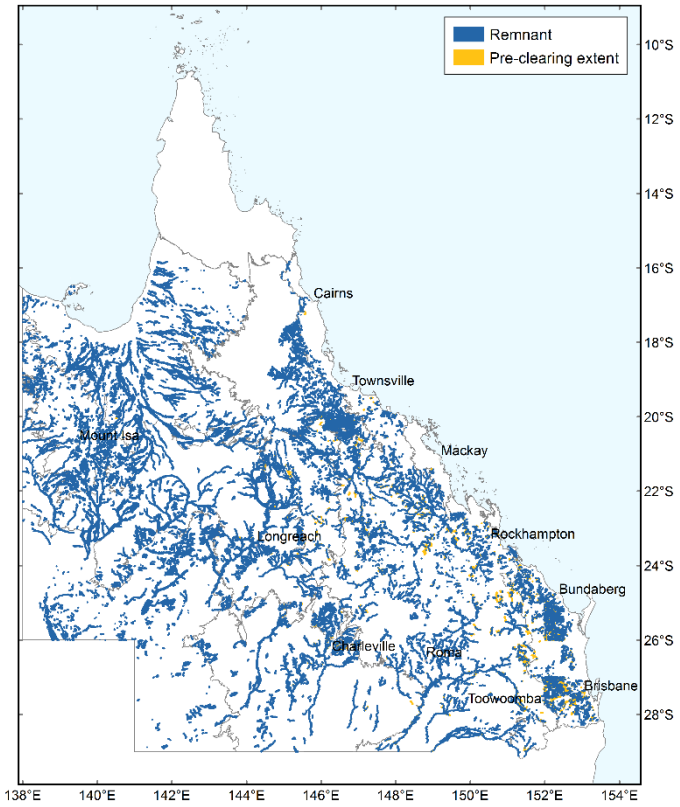


Photo 166 *Eucalyptus camaldulensis* fringing woodland on Mayne River, 5.3.1, West of Longreach, CHC.
(VJ Neldner)

Photo 167 *Eucalyptus camaldulensis* woodland with *Acacia aneura* and *A. cyperophylla* fringing drainage lines within low ranges, 5.3.4. Morney Plains Station, CHC.
(D Richter)

Floristic characteristics: *Eucalyptus camaldulensis* and/ or *Eucalyptus coolabah* dominate these fringing woodlands to open forests in most bioregions, while *E. microtheca* dominates fringing woodlands in the Gulf Plains. *E. tereticornis* dominates in SEQ and coastal Brigalow Belt situations. A shrub layer is frequently absent. The dominant tussock grasses include *Heteropogon contortus, Themeda triandra, Chrysopogon fallax, Imperata cylindrica* and *Eulalia aurea.* Frequent forbs include *Cyanthillium cinereum, Phyllanthus virgatus, Eustrephus latifolius, Brunoniella australis, Crotalaria montana, Rostellularia adscendens, Evolvulus alsinoides* and *Sida* spp.

Table 46 Six most extensive regional ecosystems included in BVG 16a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	686,892	429,378	62	OC
4.3.4x1	*Eucalyptus coolabah +/- Acacia stenophylla, Acacia cambagei, Atalaya hemiglauca* low open woodland fringing braided channels in Cretaceous mudstone and Tertiary clay landscapes	604,479	593,379	98	NC
2.3.17a	*Eucalyptus microtheca* woodland on channels in fine textured alluvial plains	337,323	335,068	99	OC
5.3.8a	*Eucalyptus coolabah* low open woodland with *Duma florulenta* on braided drainage lines	334,915	334,666	100	NC
6.3.3	*Eucalyptus camaldulensis* ± *E. coolabah* ± *E. populnea, Acacia stenophylla* woodland on alluvium	152,331	139,648	92	OC
2.3.26b	*Eucalyptus camaldulensis +/- Melaleuca fluviatilis* woodland on fringes of major watercourses in the south-east	114,069	113,480	99	OC

The Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions ecological community which is listed as endangered under the *EPBC Act* includes regional ecosystem 11.3.37 from this BVG.

Photo 168 *Eucalyptus coolabah* on braided channels, 5.3.8a, CHC. (BA Wilson)

Photo 169 *Eucalyptus camaldulensis, E. tereticornis* and *Corymbia tessellaris* open forest, 11.3.25. St Ruth's Reserve, south of Dalby, BRB. (AL Kelly)

16b Woodlands dominated by *Eucalyptus leptophleba* (Molloy red box), and associated *Corymbia tessellaris* (carbeen) or *C. clarksoniana* (grey bloodwood) or *C. dallachiana*; or dominated by *Corymbia terminalis* (desert bloodwood) or other *Corymbia* spp. in the Gulf Plains and Northwest Highlands bioregions. On sandy levees

Pre-clearing area: 1,523,839 ha

Remnant 2017 area: 1,480,382 ha (97.1% of pre-clearing)

Bioregions: GUP (80%), EIU (10%), CYP (8%), NWH (2%), MGD (minor)

Land zones: 3 (97%), 5 (3%)

Mean annual rainfall range: 600-1600 mm

Typical landforms: Alluvial terraces, levees, ridges frontages on floodplains

Typical soils: Rudosols and Red Kandosols

Structural formation range: Woodland to open woodland

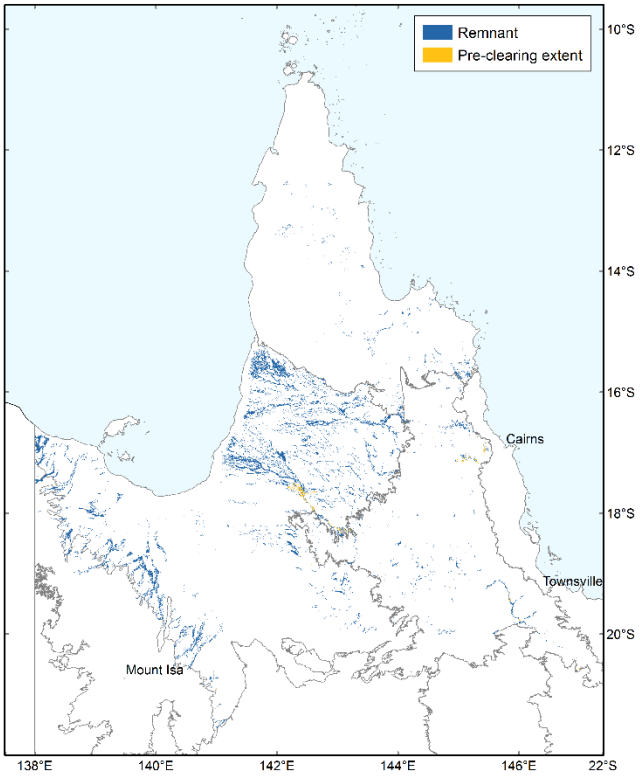


Photo 170 *Corymbia polycarpa* and *Erythrophleum chlorostachys* woodland with low tree layer of *Melaleuca nervosa* on river levee. 2.3.21g. Dorunda Station, NNE of Normanton, GUP.
(CN Appelman)

Floristic characteristics: The sparse canopy may be dominated by *Eucalyptus leptophleba* or a variety of bloodwoods including *Corymbia polycarpa, C. curtipes, C. confertiflora, C. bella, C. dallachiana* and C. *tessellaris. Erythrophleum chlorostachys, Lysiphyllum cunninghamii* and

Eucalyptus tetrodonta and *E. melanophloia* may also be present in the canopy. There is only a very sparse shrub layer present with the most frequent species being *Grewia retusifolia, Atalaya hemiglauca, Planchonia careya, Denhamia cunninghamii, Antidesma ghaesembilla, Carissa lanceolata, Ficus opposita* and *Flueggea leucopyrus.* The sparse ground layer is dominated by the graminoids *Heteropogon contortus, Sarga plumosum, Panicum mindanaense Sehima nervosum, Eulalia aurea, Chrysopogon fallax, Eragrostis stagnalis, Aristida holathera, A. hygrometrica* and *Arundinella setosa.* Frequent forbs are *Evolvulus alsinoides, Sauropus trachyspermus, Blumea saxatilis, Crotalaria montana, Afrohybanthus enneaspermus, Indigofera linifolia, Uraria lagopodioides, Vigna radiata, Zornia muriculata, Zornia prostrata* and *Galactia tenuiflora.*

Table 47 Five most extensive regional ecosystems included in BVG 16b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.3.72a	*Corymbia bella, C. curtipes* +/- *C. confertiflora, C. polycarpa* woodland on levees in active Quaternary alluvial systems (inner deltas)	168,297	162,410	97	NC
2.3.72b	*Corymbia polycarpa, C. confertiflora, C. curtipes* and *Erythrophleum chlorostachys* in mixed woodlands on levees in active Quaternary alluvial systems (outer zones of river deltas)	167,312	160,384	96	NC
2.3.21h	*Corymbia polycarpa, Eucalyptus tetrodonta, Erythrophleum chlorostachys* and *C. setosa* in mixed woodlands on abandoned levees on Quaternary deposits (recent surface).	144,710	142,255	98	NC
2.3.21b	*Eucalyptus leptophleba, Corymbia confertiflora, C. terminalis* and *C. polycarpa* in mixed woodlands on levees and active Quaternary alluvial plains on the upper reaches of major watercourses	134,600	126,431	94	OC
2.3.20e	*Corymbia bella, Eucalyptus chlorophylla, E. tectifica* and *Erythrophleum chlorostachys* in mixed woodlands on active alluvium of minor watercourses in lateritic landscapes	121,590	121,487	100	OC

Photo 171 *Eucalyptus leptophleba, Corymbia confertiflora* and *Brachychiton diversifolius* woodland, 2.3.21b. Levee of the Lynd River, Bulimba Station, GUP.
(GW Wilson)

Photo 172 *Erythrophleum chlorostachys* and *Eucalyptus tetrodonta* woodland on levee, 2.3.21h. Dunbar Station, NE of Normanton, GUP.
(CN Appelman)

16c Woodlands and open woodlands dominated by *Eucalyptus coolabah* (coolibah) or *E. microtheca* (coolibah) or *E. largiflorens* (black box) or *E. tereticornis* (blue gum) or *E. chlorophylla* on floodplains. Does not include alluvial areas dominated by herblands or grasslands or alluvial plains that are not flooded

Pre-clearing area: 6,761,992 ha

Remnant 2017 area: 4,452,515 ha (65.8% of pre-clearing)

Bioregions: GUP (34%), BRB (32%), MUL (12%), SEQ (9%), CHC (3%), CYP (3%), EIU (2%), MGD (2%), NWH (2%), NET, DEU (minor)

Land zones: 3 (100%)

Mean annual rainfall range: 200-2000 mm

Typical landforms: Flat alluvial clay plains

Typical soils: Grey and Black Vertosols

Structural formation range: Woodland to open woodland

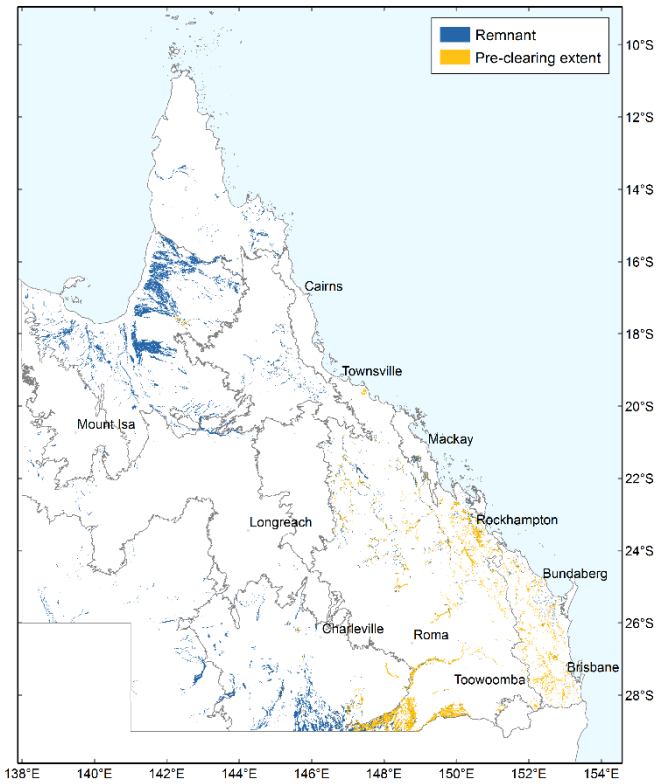


Photo 173 *Eucalyptus coolabah* open woodland with open areas dominated by *Astrebla* spp. and shaded areas dominated by *Sclerolaena* spp., 11.3.3. South of Dirranbandi, BRB. (VJ Neldner)

Floristic characteristics: *Eucalyptus coolabah* is the dominant tree in the south, while *E. microtheca* dominates the Gulf Plains and Cape York Peninsula. *E. tereticornis* dominates in SEQ and coastal Brigalow Belt. A shrub layer is frequently absent. The dominant tussock grasses including *Heteropogon contortus, Themeda triandra, Chrysopogon fallax, Imperata cylindrica* and *Eulalia aurea.* Frequent forbs include *Cyanthillium cinereum, Phyllanthus*

virgatus, Eustrephus latifolius, Brunoniella australis, Crotalaria montana, Rostellularia adscendens, Evolvulus alsinoides and *Sida* spp.

Table 48 Five most extensive regional ecosystems included in BVG 16c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.3.3	*Eucalyptus coolabah* woodland on alluvial plains	894,245	253,534	28	OC
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus* spp. woodland on alluvial plains	684,235	179,403	26	OC
2.3.11	*Eucalyptus microtheca, Excoecaria parvifolia* low open woodland and *Dichanthium* spp. on grey clay plains	679,109	675,073	99	NC
11.3.28	*Eucalyptus coolabah +/- Casuarina cristata* open woodland on alluvial plains	463,587	59,730	13	OC
12.3.3	*Eucalyptus tereticornis* woodland on Quaternary alluvium	420,731	38,883	9	E

The Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions ecological community which is listed as endangered under the *EPBC Act* includes regional ecosystems 11.3.3, 11.3.15, 11.3.16, and 11.3.28 from this BVG.

Photo 174 *Eucalyptus tereticornis* open forest, 12.3.3. Munna Creek, west of Maryborough, SEQ.
(TS Ryan)

Photo 175 *Eucalyptus tereticornis* open forest with a grassy ground layer along a depression line, 11.3.4. Barakula SF, BRB.
(AL Kelly)

Photo 176 *Eucalyptus microtheca* and *Grevillea striata* low woodland on alluvial plain, 2.3.11. Van Rook Station, NE of Normanton, GUP.
(CN Appelman)

16d River beds, open water or sand, or rock, frequently not vegetated

Pre-clearing area: 188,146 ha

Remnant 2017 area: 179,804 ha (95.6% of pre-clearing)

Bioregions: GUP (44%), EIU (31%), BRB (9%), CYP (5%), WET (4%), SEQ (3%), DEU (3%), CQC, MUL, NWH, MGD (minor)

Land zones: 3 (100%)

Mean annual rainfall range: 600-1200 mm

Typical landforms: Riverbeds of major streams, mainly bare sand or rock areas, but includes waterholes in the riverbed.

Typical soils: Rock or Rudosols

Structural formation range: Bare to sparse herbland, occasional fringing shrubland

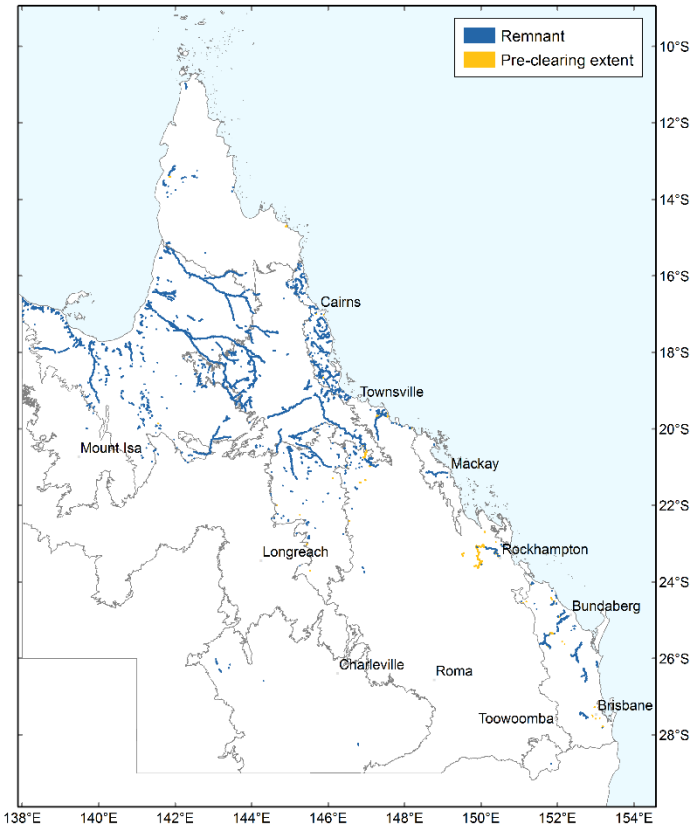


Photo 177 Sandy river bed sparsely wooded with low trees of *Melaleuca argentea*, 2.3.50a. Staaten River NP, SW of the Highbury Homestead, GUP. (GW Wilson)

Floristic characteristics: Sandy river beds sometimes with patches of ephemeral grassland, herbland or sedgeland and occasional shrubs of *Melaleuca bracteata, M. viminalis, M. trichostachya* and *M. linariifolia.*

Table 49 Five most extensive regional ecosystems included in BVG 16d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.3.12a	Sandy river beds sometimes with patches of ephemeral grassland, herbland or sedgeland and occasional shrubs of *Melaleuca* spp.	57,152	56,183	98	OC
2.3.50a	Bare sand and rock with scattered plants in channels of major watercourses	56,514	56,776	100	OC
2.3.50b	Waterholes, commonly with a wooded fringe, in active channels of major watercourses	23,698	23,808	100	OC
11.3.25f	Sandy river beds	16,468	10,852	66	OC
3.3.66x1a	Rivers & water holes with permanent water	9,119	9,042	99	OC

Photo 178 Melaleuca lined rocky river bed, 9.3.12a. Copperfield River crossing east of Kidston Mine, EIU.
(MR Newton)

Photo 179 Sandy river bed sparsely wooded with low trees of *Melaleuca argentea*, 2.3.50a. Staaten River NP, SW of Highbury Homestead, GUP. (GW Wilson)

Photo 180 Sandy river bed of the Mitchell River, 3.3.66. Near Kowanyama, CYP.
(VJ Neldner)

17 *Eucalyptus populnea* (poplar box) or *E. melanophloia* (silver-leaved ironbark) (or *E. whitei* (White's ironbark)) dry woodlands to open woodlands on sandplains or depositional plains

17a Woodlands dominated by *Eucalyptus populnea* (poplar box) (or *E. brownii* (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges

Pre-clearing area: 8,080,969 ha

Remnant 2017 area: 2,959,817 ha (36.6% of pre-clearing)

Bioregions: BRB (70%), MUL (19%), DEU (10%), EIU (1%), SEQ (0.3%), MGD (0.1%), GUP, NET (minor)

Land zones: 3 (42%), 5 (38%), 10 (8%), 9 (6%), 4 (3%), 11 (2%), 12 (1%), 8 (0.1%)

Mean annual rainfall range: 500-800 mm

Typical landforms: Flat to gently undulating plains

Typical soils: Red Sodosols and Chromosols

Structural formation range: Woodland to open woodland

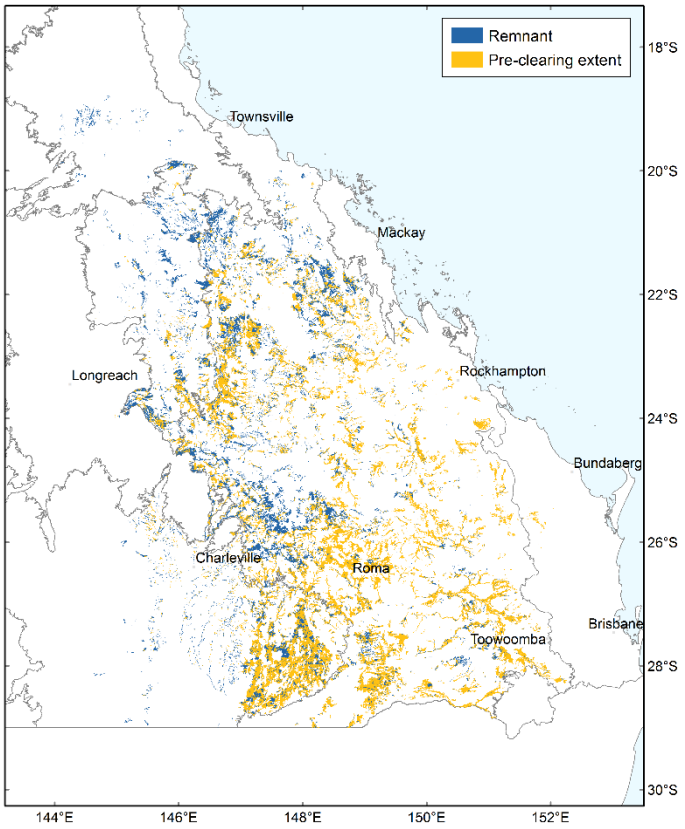


Photo 181 *Eucalyptus populnea* woodland on alluvial plain, 11.3.2, Carnarvon Station, north of Mitchell, BRB. (TJ Eyre)

Floristic characteristics: *Eucalyptus populnea* (poplar box) is the dominant tree, with *E. brownii* (Reid River box) replacing it in the north. A sparse to open shrub layer is often present with *Eremophila mitchellii, Geijera parviflora* and *Carissa lanceolata* frequent. Tussock grasses dominate the open ground layer with *Chrysopogon fallax, Eragrostis lacunaria, Fimbristylis dichotoma, Themeda triandra, Enteropogon acicularis, Heteropogon contortus, Cymbopogon refractus, Panicum effusum*, and *Aristida calycina* frequently present. *Evolvulus alsinoides, Brunoniella australis, Euphorbia drummondii, Rhynchosia minima, Sida hackettiana, Alternanthera micrantha, Eremophila debilis, Abutilon oxycarpum* and *Melhania oblongifolia* are frequent forbs.

Table 50 Five most extensive regional ecosystems included in BVG 17a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	1,925,102	505,456	26	OC
11.5.3	*Eucalyptus populnea* ± *E. melanophloia* ± *Corymbia clarksoniana* on Cainozoic sand plains/remnant surfaces	980,548	371,946	38	NC
6.5.3	*Eucalyptus populnea, Acacia aneura* ± *Eremophila mitchellii* woodland within *A. aneura* communities	632,131	189,312	30	OC
11.5.13	*Eucalyptus populnea* ± *Acacia aneura* ± *E. melanophloia* woodland on Cainozoic sand plains/remnant surfaces	572,105	94,142	16	OC
11.10.11	*Eucalyptus populnea, E. melanophloia* ± *Callitris glaucophylla* woodland on coarse-grained sedimentary rocks	541,091	321,400	59	NC

Photo 182 *Eucalyptus brownii* open woodland on Cainozoic clay plain, 10.3.6ax2. Helenslee Station, DEU.
(EJ Thompson)

Photo 183 *Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer, 11.5.1a. Boondandilla State Forest, BRB.
(C Pennay)

17b Woodlands to open woodlands dominated by *Eucalyptus melanophloia* (silver-leaved ironbark) (or *E. shirleyi* (Shirley's silver-leaved ironbark)) on sand plains and footslopes of hills and ranges

Pre-clearing area: 4,219,047 ha

Remnant 2017 area: 2,541,336 ha (60.2% of pre-clearing)

Bioregions: BRB (42%), DEU (41%), EIU (7%), SEQ (5%), NET (3%), GUP (2%), NWH (1%), MUL (0.2%)

Land zones: 5 (42%), 12 (19%), 3 (14%), 11 (13%), 9 (9%), 7 (2%)

Mean annual rainfall range: 600-800 mm

Typical landforms: On sand plains and undulating low rises, hills and ranges.

Typical soils: Red Sodosols and Chromosols

Structural formation range: Woodland to open woodland

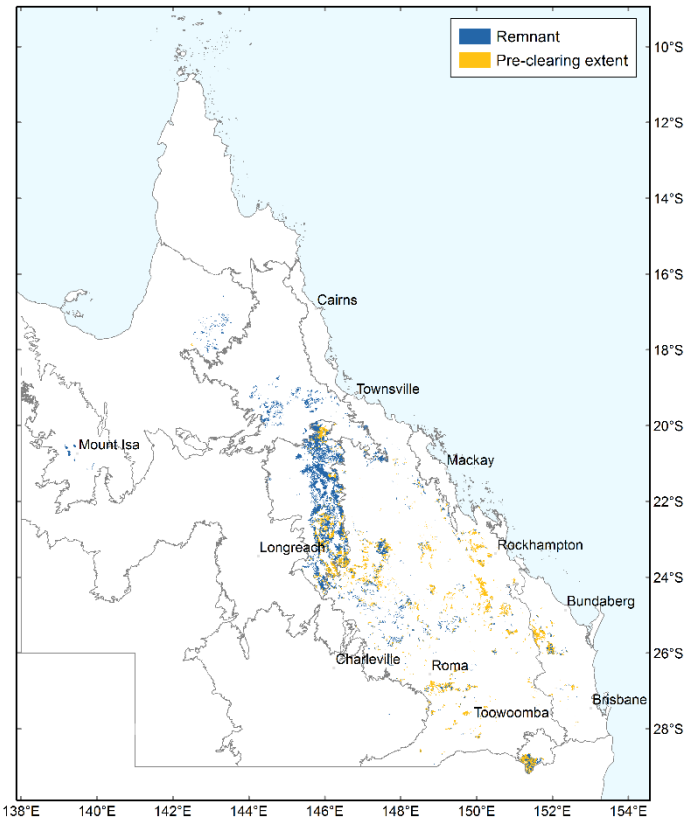


Photo 184 *Eucalyptus melanophloia* open woodland on sand plain, 10.5.5a. Bimblebox Nature Refuge, NW of Alpha, DEU.
(EJ Thompson)

Floristic characteristics: *Eucalyptus melanophloia* dominates these woodlands, apart from when it is replaced by or co-dominates with *E. shirleyi, Corymbia dallachiana, C. peltata, C. clarksoniana, Eucalyptus crebra* and *E. populnea* may sometimes also occur in the canopy. The shrub layer is very sparse with *Denhamia cunninghamii, Carissa lanceolata, Eremophila mitchellii, Psydrax oleifolia, Breynia oblongifolia, Bursaria incana* and *Petalostigma pubescens* the most frequent species. The mid-dense ground layer is dominated by the grasses *Heteropogon contortus, Themeda triandra, Chrysopogon fallax, Panicum effusum, Bothriochloa ewartiana, Digitaria brownii, Cymbopogon refractus, Eriachne mucronata, Triodia pungens, Enneapogon lindleyanus, Aristida calycina* var. *calycina* and *A. holathera* var. *holathera*. Frequent forbs are *Evolvulus alsinoides, Brunoniella australis, Rhynchosia minima,*

Rostellularia adscendens, Spermacoce brachystema, Cyanthillium cinereum, Melhania oblongifolia, Phyllanthus virgatus and *Zornia muriculata.*

Table 51 Five most extensive regional ecosystems included in BVG 17b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
10.5.5a	*Eucalyptus melanophloia* open woodland on sand plains	1,239,696	934,441	75	NC
11.12.2	*Eucalyptus melanophloia* woodland on igneous rocks	456,114	184,898	41	NC
11.9.2	*Eucalyptus melanophloia* ± *E. orgadophila* woodland on fine-grained sedimentary rocks	373,697	141,807	38	NC
11.5.5	*Eucalyptus melanophloia, Callitris glaucophylla* woodland on Cainozoic sand plains/remnant surfaces. Deep red sands	333,894	114,645	34	NC
11.11.10	*Eucalyptus melanophloia* woodland on deformed and metamorphosed sediments and interbedded volcanics	317,592	100,257	32	OC

Photo 185 *Eucalyptus melanophloia* woodland with moderate subcanopy of *Petalostigma pubescens* on broad plain, 9.5.4. On Hillgrove Sation, EIU. (MR Newton)

Photo 186 *Eucalyptus melanophloia* and *Callitris glaucophylla* woodland on Cainozoic sand plains, 11.5.5, Yuleba SF, BRB. RE Niehus)(

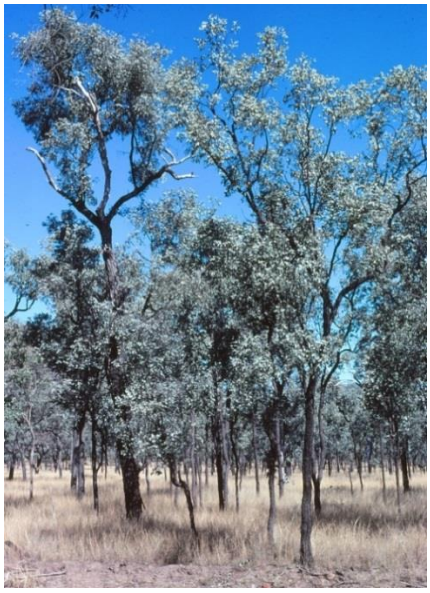


Photo 187 *Eucalyptus melanophloia* woodland on fine-grained sedimentary rocks, 11.9.2. Near Mt Moffat, BRB. (VJ Neldner)

17c *Eucalyptus whitei* (White's ironbark) or *E. similis* (Queensland yellowjacket) woodlands to open woodlands on sand sheets

Pre-clearing area: 1,805,310 ha

Remnant 2017 area: 1,722,609 ha (95.4% of pre-clearing)

Bioregions: DEU (89%), GUP (8%), EIU (3%), MGD (0.5%), BRB (0.1%)

Land zones: 5 (76%), 7 (15%), 3 (9%), 10 (1%)

Mean annual rainfall range: 500-700 mm

Typical landforms: On sand plains, sand plateaus, silcrete remnant surfaces and some alluvial fans

Typical soils: Red and Yellow Kandosols and Tenosols

Structural formation range: Woodland to open woodland

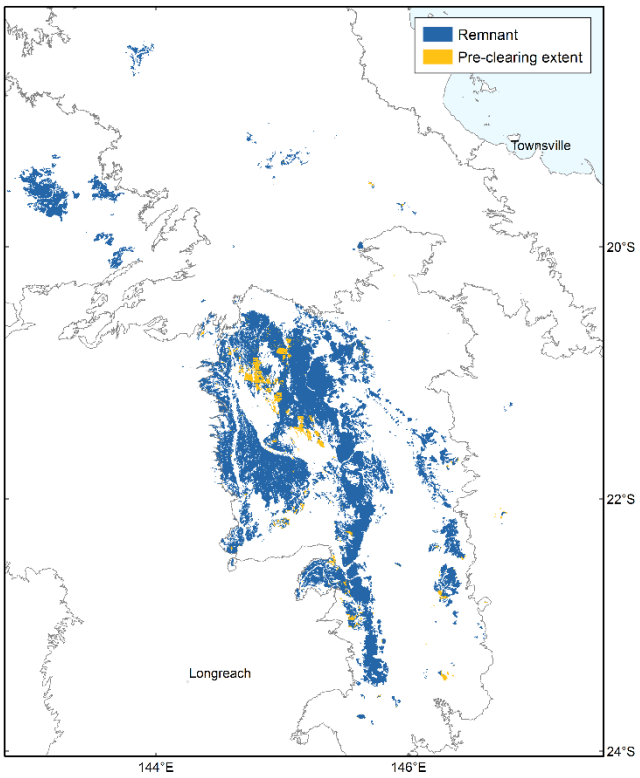


Photo 188 *Eucalyptus similis* open woodland on red sand sheet,10.5.1a. NE of Aramac, DEU. (EJ Thompson)

Floristic characteristics: *Eucalyptus similis* or *Eucalyptus whitei* dominate the woodlands of this BVG. *Corymbia setosa* may be dominant or codominant in some areas. *Corymbia brachycarpa, C. dallachiana* and *E. crebra* are sometime present as co-dominant trees. Very sparse *Acacia coriacea, Bursaria incana, Grevillea glauca, G. parallela, C. brachycarpa* and *Melaleuca nervosa* low trees may be present. A range of species may be present in the very sparse shrub layer with *Carissa lanceolata, Petalostigma banksii, P. pubescens, Denhamia cunninghamii, Psydrax oleifolia, Bursaria incana, Persoonia falcata, Acacia cowleana, Alphitonia excelsa* and *Grewia retusifolia* the most frequent species. The sparse ground layer may be dominated by *Triodia pungens,* or a range of tussock grasses including *Themeda triandra, Eriachne mucronata, Heteropogon contortus, Chrysopogon fallax, Enneapogon polyphyllus, Aristida holathera* var. *holathera, A. calycina* var. *calycina, A. ingrata,*

Cymbopogon bombycinus, Panicum effusum, Digitaria brownii, Bothriochloa ewartiana, Tripogon loliiformis, Schizachyrium fragile, Panicum effusum and *Eragrostis lacunaria.* The most frequent forbs are *Evolvulus alsinoides, Zornia muriculata, Glycine tomentella, Bonamia media, Rhynchosia minima, Melhania oblongifolia, Rostellularia adscendens, Tephrosia leptoclada, Alternanthera micrantha, Indigofera linifolia, Phyllanthus virgatus, Spermacoce brachystema* and *Waltheria indica.*

Table 52 Five most extensive regional ecosystems included in BVG 17c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
10.5.1a	*Eucalyptus similis* open woodland on sand plains	601,045	586,348	98	NC
10.5.11c	*Eucalyptus whitei* open woodland on red sand plateau (north west)	366,123	336,204	92	NC
10.7.10a	*Eucalyptus whitei* open woodland on ferricrete	183,867	178,864	97	NC
10.3.9	*Eucalyptus whitei* open woodland on sandy alluvial fans	154,112	130,881	85	NC
2.5.20	*Eucalyptus similis* and/or *E. chartaboma* +/- *Erythrophleum chlorostachys, Corymbia* spp. woodland on undulating Tertiary sand sheets	120,334	120,318	100	NC

Photo 189 *Eucalyptus whitei* open woodland on sand plain. 10.5.11c. SW of Torrens Creek, DEU.
(EJ Thompson)

Photo 190 *Eucalyptus whitei* low open woodland on ferricrete, 10.7.10a. Moorrinya NP, DEU.
(EJ Thompson)

Photo 191 *Eucalyptus whitei* open woodland, on flood plain, 10.3.9. On stock route south of Torrens Creek, DEU.
(EJ Thompson)

18 Dry eucalypt woodlands to open woodlands primarily on sandplains or depositional plains

18a Dry woodlands to open woodlands, dominated by bloodwoods (*Corymbia dallachiana, C. terminalis* (western bloodwood*), C. plena, or C. leichhardtii* (rustyjacket)) or ironbarks (*Eucalyptus quadricostata* (Pentland ironbark), *E. crebra* (narrow-leaved red ironbark) or *E. exilipes* (fine-leaved ironbark)), often with *E. acmenoides* (narrow-leaved white stringybark), *Angophora leiocarpa* (rusty gum) and *Callitris glaucophylla* (white cypress pine) in the Brigalow Belt, on sandy plateaus and plains

Pre-clearing area: 1,444,113 ha

Remnant 2017 area: 1,353,704 ha (93.7% of pre-clearing)

Bioregions: GUP (56%), DEU (24%), BRB (17%), EIU (2%), NWH (1%), MGD (0.5%)

Land zones: 5 (83%), 3 (14%), 7 (3%)

Mean annual rainfall range: 600-1000 mm

Typical landforms: Sandplains and old alluvial plains

Typical soils: Red and Yellow Kandosols and Tenosols

Structural formation range: Woodland

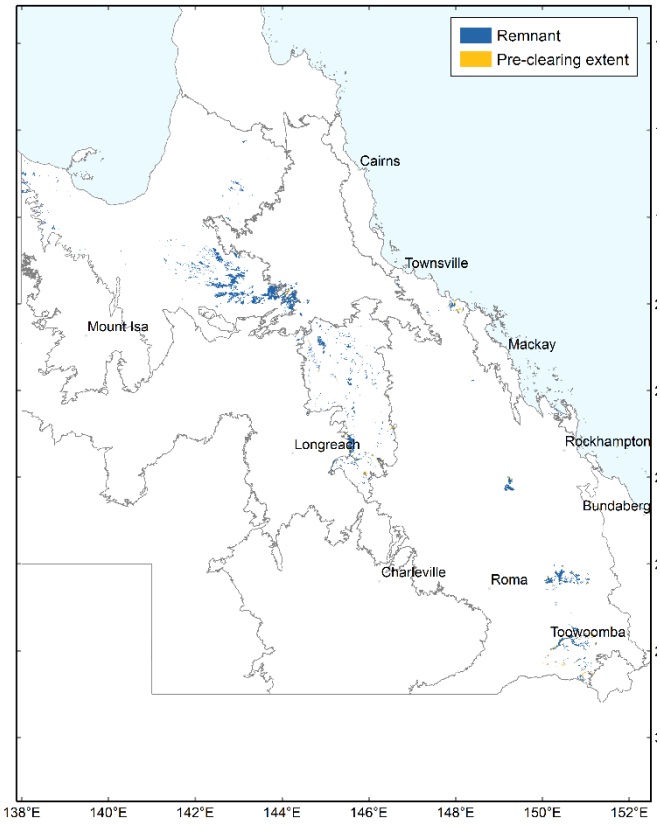


Photo 192 *Corymbia setosa* low open woodland with sparse shrub layer of *Petalostigma banksii* and *Acacia torulosa*, 2.5.18a. Esmerelda Station, GUP.
(CN Appelman)

Floristic characteristics: Woodlands dominated by bloodwoods such as *Corymbia leichhardtii, C. dallachiana, C. plena, C. terminalis* or *C. brachycarpa,* or ironbarks *Eucalyptus exilipes* or *E. quadricostata. Angophora leiocarpa* and *Callitris glaucophylla a*re sometimes also present in the canopy in the south. There is generally only a very sparse shrub layer with *Alphitonia excelsa, Petalostigma pubescens, P. banksii, Persoonia falcata, Bursaria incana, Psydrax oleifolia, Acacia julifera* subsp*. julifera, A. longispicata, Carissa lanceolata* and *Santalum lanceolatum* the most frequent species. The sparse ground layer maybe dominated by *Triodia pungens* or *T. bitextura* in some areas, or the tussock grasses *Eriachne mucronata, Chrysopogon fallax, Panicum effusum, Aristida holathera* var. *holathera, A. ingrata, A. calycina, Themeda triandra, Digitaria ammophila, D. brownii, Schizachyrium fragile, Heteropogon contortus, Enneapogon polyphyllus, Eragrostis lacunaria, Cymbopogon bombycinus* and *C. refractus.* The most frequent forbs are *Evolvulus alsinoides, Goodenia glabra, Rostellularia adscendens, Cyanthillium cinereum, Phyllanthus collinus, P. virgatus, Bonamia media, Marsdenia viridiflora, Lomandra multiflora* and *Chrysocephalum apiculatum.*

Table 53 Five most extensive regional ecosystems included in BVG 18a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.5.28a	*Corymbia polycarpa +/- C. confertiflora, Erythrophleum chlorostachys, C. grandifolia* open woodland on reworked sand deposits on broad plains	234,297	234,169	100	NC
2.5.18a	*Corymbia setosa +/- Erythrophleum chlorostachys, Eucalyptus microneura* low open woodland on Tertiary sand sheets	219,301	219,194	100	NC
2.5.24a	*Eucalyptus crebra +/- C. citriodora* open forest on sand sheets on Mesozoic sandstone plateaus	184,897	180,058	97	NC
10.5.2a	*Corymbia dallachiana* and *C. plena* open woodland on sand plains (eastern)	150,001	126,777	85	NC
11.3.14	*Eucalyptus* spp., *Angophora* spp., *Callitris* spp. woodland on alluvial plains	105,673	80,810	76	NC

Photo 193 *Eucalyptus creb*ra and *Corymbia intermedia* woodland with *Melaleuca* spp. dominant in understorey. 11.5.12a. Shoalwater Bay Training Area, BRB. (AL Kelly)

Photo 194 *Eucalyptus whitei* open woodland on sand, 10.5.2ax1. Stock route, SW of Torrens Creek, DEU. (EJ Thompson)

18b Woodlands dominated *Eucalyptus crebra* (narrow-leaved red ironbark) frequently with *Corymbia* spp. or *Callitris* spp. on flat to undulating plains

Pre-clearing area: 2,191,342ha

Remnant 2017 area: 1,558,408 ha (71.1% of pre-clearing)

Bioregions: BRB (74%), DEU (14%), EIU (12%), SEQ (0.2%), GUP (0.1%), CQC, NET (minor)

Land zones: 5 (90%), 3 (10%)

Mean annual rainfall range: 600-1000 mm

Typical landforms: Cainozoic sand plains/remnant surfaces and alluvial plains

Typical soils: Tenosols and Rudosols

Structural formation range: Woodland

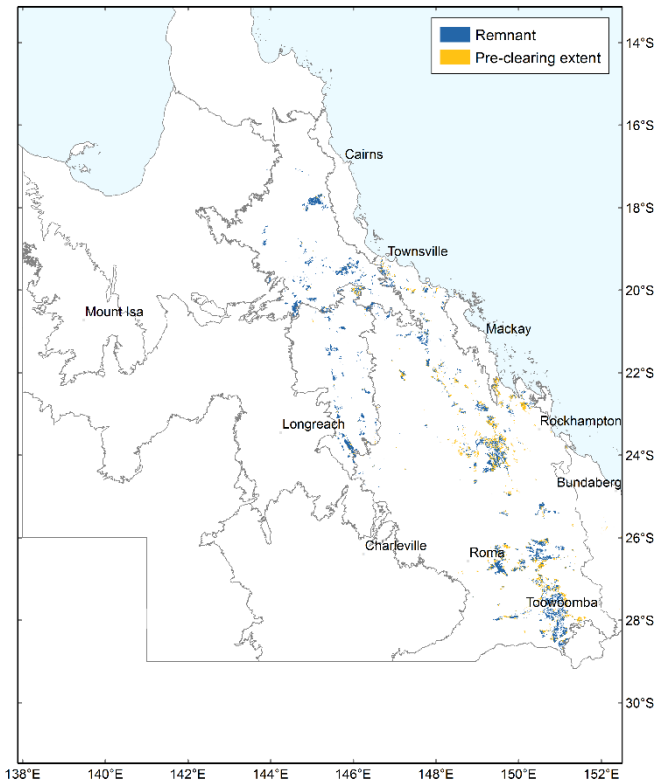


Photo 195 *Eucalyptus crebra* and *Corymbia clarksoniana* woodland, 11.5.9. Near Charters Towers, BRB.
(A Borsboom)

Floristic characteristics: The ironbark *Eucalyptus crebra* dominates these woodlands. *Corymbia clarksoniana, C. dallachiana, C. brachycarpa, Angophora leiocarpa* and *Eucalyptus populnea* may also be present in the sparse canopy. *Callitris glaucophylla, Allocasuarina luehmannii* and *Lysicarpus angustifolius* sometimes form a conspicuous subcanopy layer. A variety of shrubs can occur in a very sparse layer with *Petalostigma pubescens, Alphitonia excelsa, Denhamia cunninghamii, Acacia leiocalyx* subsp. *leiocalyx, A. conferta, A. leiocalyx, Geijera parviflora* and *Grewia retusifolia* the most frequent species. The mid-dense ground layer is dominated by the graminoids *Themeda triandra, Heteropogon contortus, H. triticeus Aristida caput-medusae, A. calycina* var. *calycina, Cymbopogon refractus, Fimbristylis dichotoma, Panicum effusum, Chrysopogon fallax, Eragrostis sororia, E. lacunaria, Gahnia*

aspera, Eriachne mucronata and *Eremochloa bimaculata. Brunoniella australis, Evolvulus alsinoides, Cyanthillium cinereum, Rostellularia adscendens, Cheilanthes sieberi, Phyllanthus virgatus, Dianella revoluta, Chrysocephalum apiculatum, Sida hackettiana, Grewia retusifolia* and *Laxmannia gracilis* are most frequent forbs.

Table 54 Five most extensive regional ecosystems included in BVG 18b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.5.1	*Eucalyptus crebra* and/or *E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii* woodland on Cainozoic sand plains/remnant surfaces	623,801	420,898	67	NC
11.5.2	*Eucalyptus crebra, Corymbia* spp., with *E. moluccana* on lower slopes of Cainozoic sand plains/remnant surfaces	304,452	173,009	57	NC
10.5.1b	*Corymbia brachycarpa* open woodland on sand plains	186,889	176,859	95	NC
9.5.3	*Eucalyptus crebra* or *E. drepanophylla* and *Corymbia clarksoniana* woodland on sand plains	186,083	181,695	98	NC
11.5.9b	*Eucalyptus crebra, E. tenuipes, Lysicarpus angustifolius +/- Corymbia* spp. woodland	177,346	101,578	57	NC

Photo 196 *Callitris glaucophylla* and *Eucalyptus crebra* woodland, 11.5.1. Boondandilla State Forest, BRB. (BA Wilson)

Photo 197 *Eucalyptus crebra* tall woodland with *E. brownii* and *Corymbia clarksoniana*. The ground layer is dominated by *Heteropogon contortus,* 9.5.3. NW of Shelly Mount, Clarke Hills Station, EIU.
(CPF Kahler)

Photo 198 *Corymbia brachycarpa* open woodland, 10.5.1b. Near Jericho, DEU. (EJ Thompson)

18c Woodlands and open woodlands dominated by *Eucalyptus chlorophylla* (or *E. leptophleba* (Molloy red box) on heavy soils) frequently with *Corymbia* spp.; or dominated by *E. tectifica* west of Burketown

Pre-clearing area: 842,545 ha

Remnant 2017 area: 812,119 ha (96.4% of pre-clearing)

Bioregions: CYP (49%), GUP (26%), EIU (19%), MGD (3%), NWH (3%)

Land zones: 9 (54%) 5 (31%), 4 (9%), 3 (3%), 12 (2%)

Mean annual rainfall range: 800-2000 mm

Typical landforms: Undulating to rolling plains

Typical soils: Yellow Dermosols and Redoxic Hydrosols

Structural formation range: Woodland to open woodland

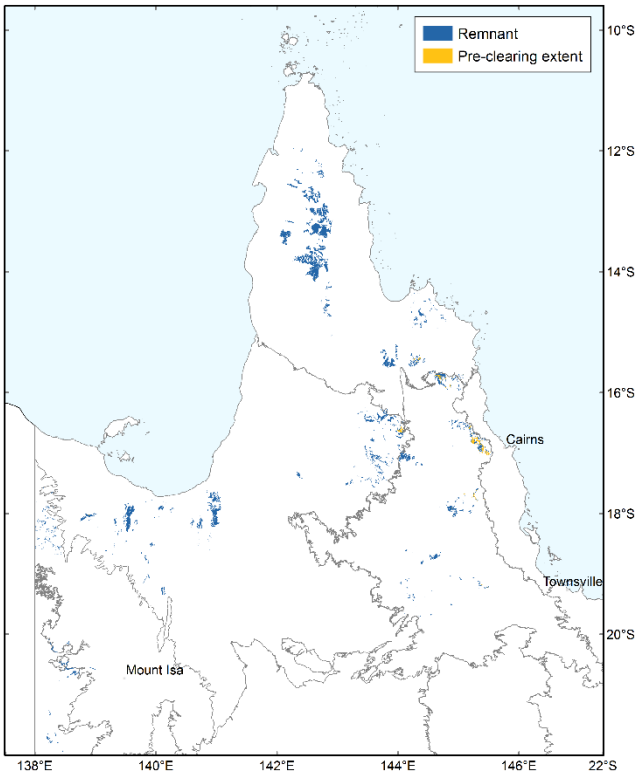


Photo 199 *Eucalyptus leptophleba* and *E. platyphylla* woodland on plain, 3.9.4a. Sudley Station, CYP.
(MR Newton)

Floristic characteristics: The sparse canopy is usually dominated either *Eucalyptus leptophleba* or *E. chlorophylla. E. platyphylla, Erythrophleum chlorostachys, Corymbia clarksoniana, C. polycarpa* and *C. dallachiana* may be present as codominant trees. *Melaleuca viridiflora, M. nervosa, M. stenostachya, Brachychiton diversifolius* subsp*. orientalis,* and *Petalostigma pubescens* may be present as very sparse low trees. The very sparse shrub layer includes a variety of species with the most frequent being *Grewia retusifolia, Dolichandrone heterophylla, Carissa lanceolata, Denhamia cunninghamii, Petalostigma pubescens, P. banksii, Melaleuca viridiflora, Planchonia careya, Flueggea virosa* subsp*. melanthesoides, Grevillea parallela* and *Terminalia platyptera.* The mid-dense to dense ground

layer is dominated by the grasses *Heteropogon contortus, H. triticeus, Sarga plumosum, Themeda triandra, T. arguens, Schizachyrium fragile, Capillipedium parviflorum, Chrysopogon fallax, Mnesithea formosa, Setaria surgens* and *Alloteropsis semialata.* Frequent forbs are *Crotalaria medicaginea, C. montana, Phyllanthus virgatus, Cayratia trifolia, Evolvulus alsinoides, Ipomoea eriocarpa, Galactia tenuiflora, Flemingia parviflora, Hibiscus meraukensis, Rostellularia adscendens, Commelina ensifolia* and *Waltheria indica.*

Table 55 Five most extensive regional ecosystems included in BVG 18c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.9.4a	*Eucalyptus leptophleba* ± *Corymbia dallachiana* open woodland on rolling plains	248,335	247,922	100	NC
3.9.2a	*Eucalyptus chlorophylla* open woodland on undulating clay plains	132,172	129,986	98	NC
2.4.4a	*Eucalyptus microtheca* low woodland on Tertiary to early Pleistocene clay deposits	75,318	75,117	100	NC
2.9.7a	*Eucalyptus chlorophylla* ± *Terminalia* spp. woodland on Cretaceous mudstone footslopes and plains.	52,188	49,281	94	OC
9.5.6a	*Eucalyptus leptophleba* ± *Corymbia clarksoniana* woodland on Tertiary remnants	48,426	45,075	93	NC

Photo 200 *Eucalyptus chlorophylla* woodland on undulating plain, 3.9.2a. Rokeby Station, CYP.
(MR Newton)

Photo 201 *Eucalyptus leptophleba* and *E. platyphylla* woodland, 9.5.6a. South of Innot Hot Springs, EIU.
(MR Newton)

Photo 202 *Eucalyptus chlorophylla* low woodland with shrub layer of *Carissa lanceolata*, 2.9.7a. Near Gamboola, GUP.
(GW Wilson)

18d Woodlands to low open woodlands dominated by *Eucalyptus microneura* (Gilbert River box/Georgetown box) sometimes with *Corymbia* spp.

Pre-clearing area: 602,118 ha

Remnant 2017 area: 595,890 ha (99.0% of pre-clearing)

Bioregions: GUP (78%), EIU (22%)

Land zones: 5 (68%), 10 (23%), 3 (9%), 12 (1%)

Mean annual rainfall range: 600-1000 mm

Typical landforms: On undulating plains, low rises, rocky ranges and plateaus

Typical soils: Red Kandosols, Chromosols and Rudosols

Structural formation range: Woodland to open woodland

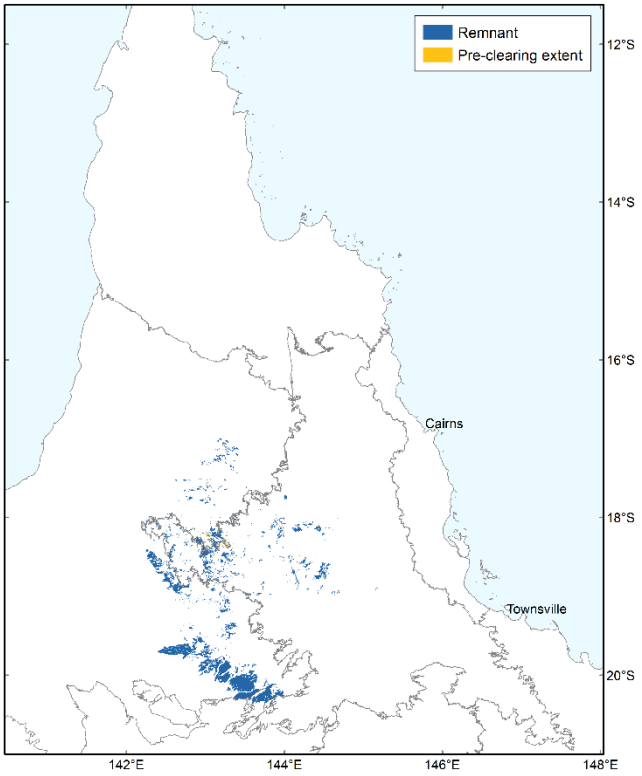


Photo 203 *Eucalyptus microneura* and *Corymbia pocillum* low open woodland, with *Petalostigma banksii* shrub layer on sand plain, 2.5.9. Fog Creek Station, GUP.
(CN Appelman)

Floristic characteristics: *Eucalyptus microneura* dominates the sparse to very sparse canopy. *Erythrophleum chlorostachys, Terminalia platyptera, T. aridicola, Atalaya hemiglauca* and *Erythroxylum ellipticum* may also be present as sparse trees. There may be a very sparse shrub layer with *Carissa lanceolata, Gardenia vilhelmii, Petalostigma banksii, Denhamia cunninghamii, Melaleuca citrolens, M. viridiflora, Acacia chisholmii* and *Dodonaea physocarpa* the most frequent species. The ground layer can be mid-dense and frequent graminoids include *Heteropogon contortus, Schizachyrium fragile, Triodia pungens, Aristida ingrata, A. latifolia, Capillipedium parviflorum, Eriachne ciliata, E. obtusa* and *Themeda triandra.* Frequent

forbs are *Zornia muriculata, Brunoniella australis, Melhania oblongifolia, Desmodium varians, Drosera lanata, Malvastrum americanum* var. *americanum, Polycarpaea corymbosa* and *Tephrosia leptoclada.*

Table 56 Five most extensive regional ecosystems included in BVG 18d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.5.9	*Eucalyptus microneura* woodland on plains and plateaus on earths, podsolics and skeletal soils	312,680	308,764	99	NC
2.10.1a	*Eucalyptus microneura* low woodland on plains and low rises of Mesozoic sandstone	88,676	88,611	100	NC
9.5.10a	*Eucalyptus microneura* ± *Corymbia pocillum* or *C. erythrophloia* ± *Terminalia* spp. low woodland on undulating plains	59,132	58,375	98	NC
9.3.20	*Eucalyptus microneura* ± *Corymbia* spp. ± *E. leptophleba* woodland on alluvial plains	44,097	43,389	98	NC
2.10.1b	*Eucalyptus microneura* ± *Corymbia terminalis* low open woodland with *Acacia chisholmii* on undulating to steep rocky sandstone terrain	33,893	33,863	100	NC

Photo 204 *Eucalyptus microneura* and *Terminalia aridicola* subsp. *chillagoensis* shrubby low woodland on gently undulating plain, 9.5.10a. South of Eveleigh Homestead, EIU.
(ID Fox)

Photo 205 *Eucalyptus microneura* low open woodland with sparse grass cover of *Aristida* sp. on alluvial plain, 9.3.20. SW of Georgetown, EIU.
(MR Newton)

Photo 206 *Eucalyptus microneura* (Gilbert River box/Georgetown box), GUP.
(CPF Kahler)

19 *Eucalyptus* spp. (*E. leucophloia* (snappy gum), *E. leucophylla* (Cloncurry box), *E. persistens*, *E. normantonensis* (Normanton box)) low open woodlands often with *Triodia* spp. dominated ground layer

19a Low open woodlands dominated *by Eucalyptus leucophloia* (snappy gum) with *Triodia* spp. dominated ground layer, mainly on hills and ranges

Pre-clearing area: 3,221,645 ha

Remnant 2017 area: 3,212,816 ha (99.7 % of pre-clearing)

Bioregions: NWH (85%), GUP (9%), MGD (6%)

Land zones: 7 (43%), 11 (38%), 5 (9%), 12 (5%), 10 (2%), 9 (2%)

Mean annual rainfall range: 400-800 mm

Typical landforms: Scarps, plateaus and slopes of metamorphic, granitic and sandstone ranges

Typical soils: Shallow Rudosols

Structural formation range: Low open woodland to wooded hummock grassland

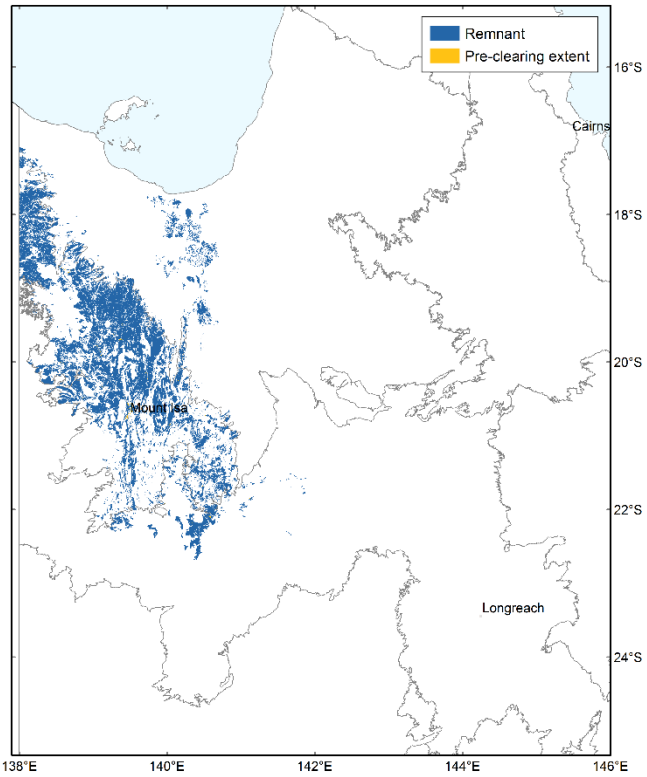


Photo 207 *Eucalyptus leucophloia* open woodland with *Triodia* spp. dominated ground layer, 1.11.2a, near Mt Isa, NWH. (DT Kelman)

Floristic characteristics: *Eucalyptus leucophloia* subsp*. euroa* generally dominates the very sparse low canopy. *Eucalyptus leucophylla* and *Corymbia terminalis* are sometimes present as co-dominant trees. *C. capricornia* and *C. aspera* dominate in some situations. A sparse shrub layer may be present, with *Acacia chisholmii, A. monticola, A. retivenea, A. hilliana, Carissa lanceolata, Terminalia canescens*, *Atalaya hemiglauca, Grevillea wickhamii, G. dryandri, Eremophila longifolia, Gossypium australe, Petalostigma quadriloculare* and *Denhamia cunninghamii* frequently occurring species. The mid-dense ground layer is generally dominated by the hummock grasses *Triodia pungens, T. molesta, Triodia longiceps* or *T. bitextura.* Tussock grasses that are frequently present include *Enneapogon lindleyanus, E. polyphyllus, Eriachne mucronata, E. ciliata, Mnesithea formosa, Eulalia aurea, Schizachyrium fragile, Aristida pruinosa, Heteropogon contortus, Themeda triandra, Cymbopogon bombycinus* and *Digitaria brownii.* Frequent forbs are *Cleome viscosa, Bulbostylis barbata, Evolvulus alsinoides, Indigofera linifolia, Heliotropium tenuifolium, H. ballii, Hibiscus sturtii, Crotalaria medicaginea* and *Waltheria indica.*

Table 57 Five most extensive regional ecosystems included in BVG 19a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
1.11.2a	*Eucalyptus leucophloia* often with *Corymbia* spp., *Terminalia aridicola* and *E. leucophylla* low open woodland	1,211,094	1,205,823	100	NC
1.7.7b	*Corymbia capricornia* and/or *Eucalyptus miniata* low open woodland	290,839	290,686	100	NC
1.5.3	*Eucalyptus leucophloia* low open woodland on sandy and gravelly red soils	290,317	288,719	100	NC
1.7.7a	*Corymbia capricornia* low open woodland on silcrete	284,133	283,839	100	NC
1.7.1a	*Eucalyptus leucophloia* low open woodland on skeletal soils on lateritic scarps and plateaus	270,144	269,737	100	NC

Photo 208 *Corymbia capricornia* and *Eucalyptus miniata* open woodland with shrub layer dominated by *Grevillea dryandrii* and ground layer by *Triodia bitextura*,1.7.7b. Lawn Hill Station, NWH.
(DT Kelman)

Photo 209 *Eucalyptus leucophloia* open woodland with Triodia spp. dominated ground layer, 1.5.3, near Mt Isa, NWH. (VJ Neldner)

19b Low open woodlands dominated by *Eucalyptus leucophylla* (Cloncurry box) or less extensively *Corymbia terminalis* (western bloodwood) low open woodlands and related associations, mainly lower slopes and valleys

Pre-clearing area: 2,962,364 ha

Remnant 2017 area: 2,939,803 ha (99.2% of pre-clearing)

Bioregions: NWH (76%), MGD (13%), GUP (11%), CHC (0.1%)

Land zones: 5 (29%), 11 (29%), 9 (17%), 3 (12%), 12 (10%), 7 (3%)

Mean annual rainfall range: 350-1200 mm

Typical landforms: Low hills and rises through to sand plains

Typical soils: Shallow Rudosols

Structural formation range: Low open woodland to wooded hummock grassland

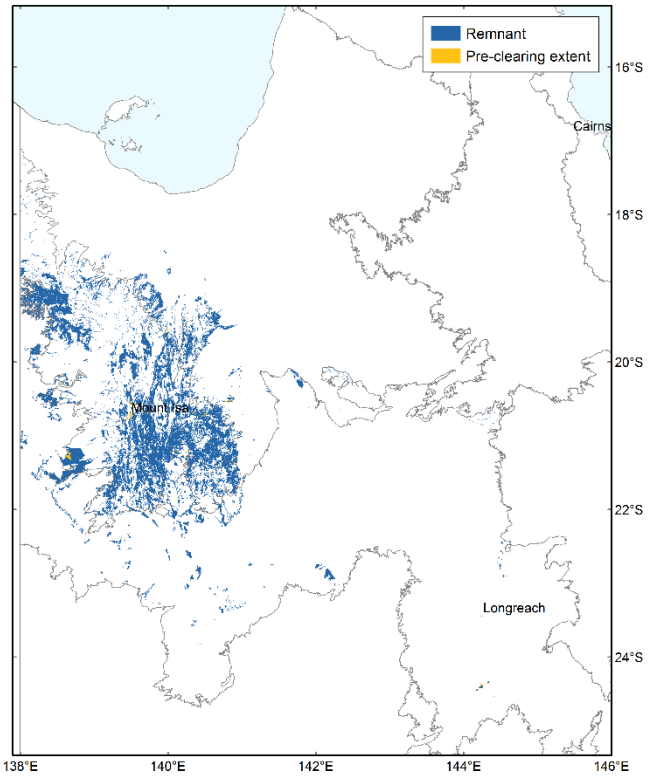


Photo 210 *Eucalyptus leucophylla and Corymbia terminalis* low woodland with a ground layer of *Triodia pungens* and tussock grasses, 1.5.4d. Riversleigh Station, NWH. (DT Kelman)

Floristic characteristics: *Eucalyptus leucophylla* and/or *Corymbia terminalis* dominate the very sparse low canopy. *E. pruinosa, Atalaya hemiglauca* and *Corymbia aparrerinja* are occasionally present. *Acacia chisholmii* is frequent in the shrub layer and may dominate in some situations. Other frequent shrub species include *Carissa lanceolata, Gossypium australe, Eremophila longifolia, Senna artemisioides* subsp*. helmsii, S artemisioides* subsp*. oligophylla* and *Acacia tenuissima.* The ground layer is often dominated by the hummock grasses *Triodia longiceps, T. pungens* or *T. brizoides.* Frequent tussock grasses include *Enneapogon polyphyllus, Aristida contorta, A. latifolia, A. inaequiglumis, A. pruinosa, Dichanthium sericeum* subsp*. polystachyum, Heteropogon contortus, Sporobolus australasicus* and *Themeda triandra.* Frequent forbs include *Salsola australis, Sida fibulifera, S. filiformis, Solanum quadriloculatum, Indigofera linifolia, I. linnaei, Cleome viscosa, Melhania oblongifolia, Heliotropium tenuifolium, Bulbostylis barbata, Evolvulus alsinoides* var*. villosicalyx, Pterocaulon serrulatum, Ptilotus obovatus* and *Achyranthes aspera.*

Table 58 Five most extensive regional ecosystems included in BVG 19b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
1.11.3a	*Eucalyptus leucophylla* low open woodland often with *Corymbia terminalis, C. aparrerinja* and *E. leucophloia*	526,083	521,934	99	NC
1.5.4d	*Eucalyptus leucophylla* low open woodland on red earths in valleys	277,192	273,837	99	NC
2.5.12a	*Eucalyptus pruinosa* and/or *Corymbia terminalis +/- Lysiphyllum cunninghamii* low woodland on sandy outwash plains and residuals	183,977	181,172	98	NC
1.12.3a	*Eucalyptus leucophylla* low open woodland on granites	180,754	180,535	100	NC
1.3.13a	*Eucalyptus leucophylla* and/or *Corymbia terminalis* woodland on levees and minor drainage lines	149,050	148,199	99	NC

Photo 211 *Eucalyptus pruinosa* woodland with a shrubby understorey on a sand plain, 2.5.12a. Near Nardoo, GUP.
(GW Wilson)

Photo 212 *Eucalyptus leucophylla* low open woodland with a ground layer of *Triodia pungens*, 1.9.5b. Near Musselbrook, NWH.
(DT Kelman)

19c Low open woodlands dominated by *Eucalyptus pruinosa* mainly on sandplains, outwash areas and lateritised surfaces

Pre-clearing area: 1,264,414 ha

Remnant 2017 area: 1,261,152 ha (99.7% of pre-clearing)

Bioregions: GUP (64%), NWH (36%), MGD (0.8%)

Land zones: 5 (79%), 7 (14%), 3 (6%), 11 (1%)

Mean annual rainfall range: 400-1200 mm

Typical landforms: Sandy and gravelly plains to low rises

Typical soils: Red Kandosols and Tenosols

Structural formation range: Low open woodland

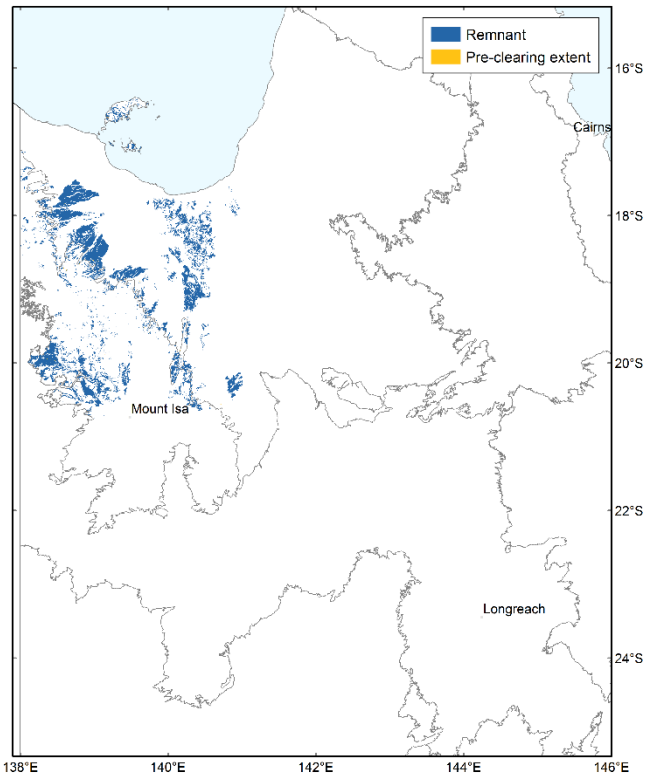


Photo 213 *Eucalyptus pruinosa, Lysiphyllum cunninghamii* and *Terminalia canescens* low open woodland on level sand sheet overlying ferricrete surface, 2.5.23a. Lawn Hill Station, GUP. (HA Dillewaard)

Floristic characteristics: *Eucalyptus pruinosa* usually dominates these low open woodlands. *Corymbia terminalis* and *Eucalyptus leucophloia* may sometimes be present as co-dominant trees. A sparse shrub layer may be present with frequent species being *Carissa lanceolata, Acacia elachantha, Capparis lasiantha, Dolichandrone heterophylla, Alectryon oleifolius, Denhamia cunninghamii, Eremophila longifolia, Gossypium australe, Melaleuca viridiflora* and *Senna artemisioides* subsp. *oligophylla. Triodia pungens* dominates the mid-dense ground

layer at many sites. Frequently present tussock grasses are *Chrysopogon fallax, Aristida pruinosa, A. ingrata, A. inaequiglumis, A. latifolia, Enneapogon polyphyllus, Eulalia aurea, Sporobolus australasicus, Panicum laevinode, Eriachne ciliata, Cenchrus pennisetiformis* and *Schizachyrium fragile.* Frequent forbs are *Bulbostylis barbata, Cleome viscosa, Abutilon otocarpum, Indigofera linifolia, I. linnaei, Streptoglossa decurrens, Evolvulus alsinoides, Hybanthus aurantiacus, Portulaca oleracea, Ptilotus fusiformis, Salsola australis* and *Sida fibulifera.*

Table 59 Five most extensive regional ecosystems included in BVG 19c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
1.5.13	*Eucalyptus pruinosa* low open woodland	318,467	317,149	100	OC
2.5.31	*Eucalyptus pruinosa, Grevillea striata, Atalaya hemiglauca* and *Lysiphyllum cunninghamii* on plains and low rises derived from deeply weathered siltstones.	142,072	141,713	100	NC
2.5.23b	*Eucalyptus pruinosa, Corymbia setosa, Terminalia canescens* and *E. chlorophylla* in mixed low open woodlands on sand sheets overlying Tertiary lateritic surfaces	113,935	113,878	100	NC
2.5.23a	*Eucalyptus pruinosa, Lysiphyllum cunninghamii, Corymbia terminalis* and *E. chlorophylla* in mixed low open woodlands on sand sheets overlying Tertiary lateritic surfaces	84,176	84,004	100	NC
2.7.5a	*Eucalyptus pruinosa, E. chlorophylla, Terminalia canescens, Corymbia setosa* in mixed low open woodlands on broad, Tertiary lateritic surfaces.	82,969	82,839	100	NC

Photo 214 *Eucalyptus pruinosa* low open woodland on a Tertiary plateau. The ground layer is composed of sedges, tussock grasses and *Triodia pungens,* 2.5.31. Wurung Station, GUP
(GW Wilson)

Photo 215 *Eucalyptus pruinosa* low open woodland with a sparse shrub layer of *Acacia hilliana* and a ground layer of *Triodia pungens,* 1.9.14. Lawn Hill NP, NWH.
(DT Kelman)

19d Low open woodlands dominated by *Eucalyptus persistens* (or *E. normantonensis* (Normanton box), *E. tardecidens, E. provecta*) with *Triodia* spp. dominated ground layer, mainly on hills and ranges

Pre-clearing area: 1,556,021 ha

Remnant 2017 area: 1,506,876 ha (96.8% of pre-clearing)

Bioregions: EIU (51%), CHC (21%), BRB (12%), GUP (6%), DEU (5%), MGD (4%), MUL (0.8%), NWH (0.7%), CYP (0.1%)

Land zones: 7 (48%), 11 (43%), 12 (4%), 5 (4%) 4 (1%), 10 (1%)

Mean annual rainfall range: 300-1000 mm

Typical landforms: Steep to rolling metamorphic hills and rises in the Einasleigh Uplands, and slopes and plateau margins of residuals elsewhere

Typical soils: Yellow Dermosols and Brown Kandosols

Structural formation range: Woodland, low woodland to tall open shrubland

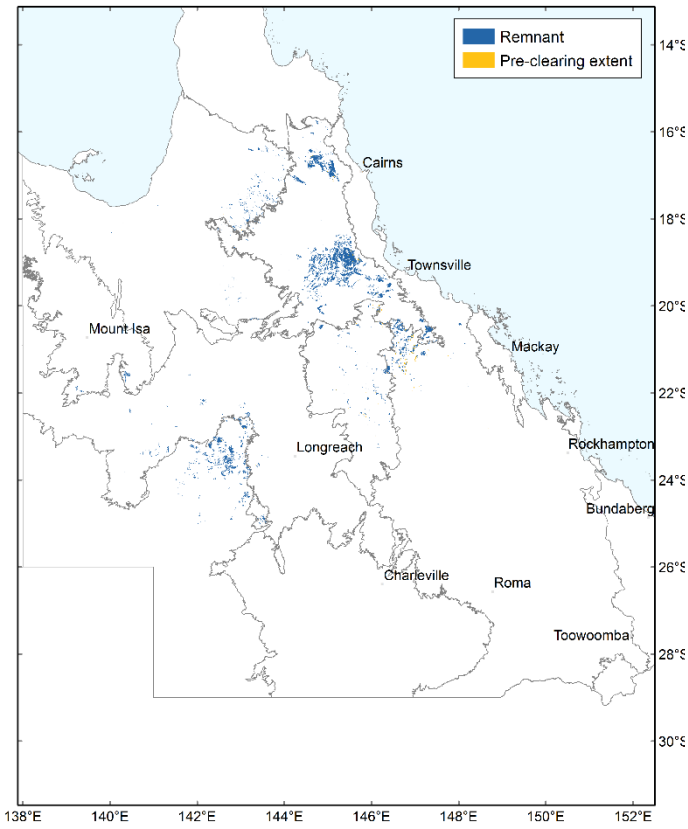


Photo 216 *Eucalyptus persistens* woodland on low ridge, 9.11.5. South west of Greenvale, EIU. (MR Newton)

Floristic characteristics: *Eucalyptus persistens* or *E. tardecidens* dominate the sparse canopy in the eastern bioregions, while *E. normantonensis* dominates the canopy in the western bioregions. Other trees such as *E. crebra, E. exserta, Corymbia dallachiana, C. clarksoniana, Acacia shirleyi* and *Melaleuca stenostachya* may be present as scattered trees in

the canopy. A number of very sparsely scattered shrub species can occur, with *Denhamia cunninghamii, Carissa lanceolata, Atalaya hemiglauca, Petalostigma banksii, P. pubescens, Eremophila mitchellii, Erythroxylum australe, Carissa ovata* and *Dolichandrone heterophylla* the most frequent. The sparse ground layer is generally dominated by *Triodia bitextura* or *T. longiceps* in the inland areas, whereas the tussock grasses *Themeda triandra, Chrysopogon fallax, Heteropogon contortus, Paspalidium gracile, Enneapogon lindleyanus, Panicum effusum, Aristida queenslandica* var*. queenslandica, Eriachne mucronata* and *Schizachyrium fragile* dominate in eastern areas. Frequent forbs include *Evolvulus alsinoides, Brunoniella australis, B. acaulis, Cyanthillium cinereum, Phyllanthus virgatus, P. carpentariae, Crotalaria medicaginea* and *Zornia muriculata* subsp*. angustata.*

Table 60 Five most extensive regional ecosystems included in BVG 19d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
9.11.5	*Eucalyptus persistens* ± *E. crebra* woodland on low metamorphic hills	390,051	386,021	99	NC
5.7.3	*Eucalyptus normantonensis* tall shrubland with *Triodia* spp. on slopes and plateau margins of residuals	322,767	321,600	100	NC
9.11.25	*Eucalyptus tardecidens* or *E. chlorophylla* ± *Corymbia* spp. ± *E. cullenii* low woodland on steep to rolling metamorphic hills and rises	194,262	192,801	99	NC
11.7.3	*Eucalyptus persistens, Triodia mitchellii* open woodland on stripped margins of Cainozoic lateritic duricrust	105,041	91,328	87	NC
11.11.12	*Eucalyptus persistens* low woodland on deformed and metamorphosed sediments and interbedded volcanics	76,263	59,949	79	NC

Photo 217 *Eucalyptus normantonensis* tall shrubland with *Triodia* spp., 5.7.3. Near Flodden Hills CHC. (D Richter)

Photo 218 *Acacia brachystachya* and *Eucalyptus normantonensis* tall open shrubland with scattered *Triodia longiceps.* 4.7.2. Swords Range, MGD. (VJ Neldner)

20 *Callitris glaucophylla* (white cypress pine) or *C. intratropica* (northern cypress pine) woodlands to open forests

20a Woodlands to open forests dominated by *Callitris glaucophylla* (white cypress pine) or *C. intratropica* (northern cypress pine)

Pre-clearing area: 1,261,729 ha

Remnant 2017 area: 870,261 ha (69.0% of pre-clearing)

Bioregions: BRB (74%), MUL (20%), EIU (6%), GUP (0.3%), DEU (0.1%)

Land zones: 10 (53%), 3 (35%), 12 (6%), 5 (6%)

Mean annual rainfall range: 500-1000 mm

Typical landforms: On Cainozoic alluvial plains and sediments derived from old alluvial levees and dunes

Typical soils: Red Sodosols and Tenosols

Structural formation range: Open forest to open woodland

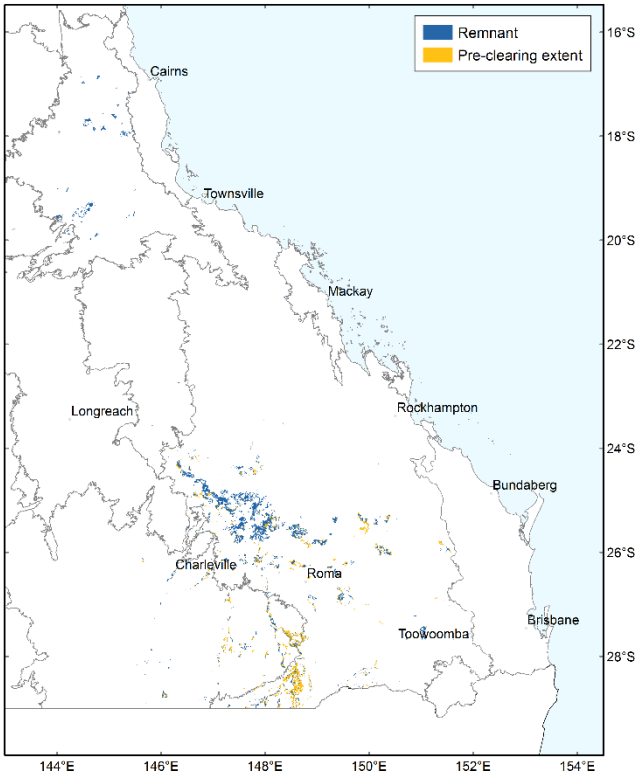


Photo 219 *Callitris glaucophylla* open forest, 11.5.4a. Thallon, west of Goondiwindi, BRB. (BA Wilson)

Floristic characteristics: *Callitris glaucophylla* dominates the canopy in the southern bioregions, while *C. intratropica* dominates in the Einasleigh Uplands. *Eucalyptus melanophloia, E. populnea, E. chloroclada, E. crebra, E. shirleyi, Corymbia clarksoniana, C. tessellaris* or *Angophora leiocarpa* may be scattered in the canopy or as emergent trees. *Lysicarpus angustifolius, Geijera parviflora* and *Allocasuarina luehmannii* may form a sparse subcanopy tree layer. A variety of sparsely scattered shrubs may occur with *Eremophila longifolia, Acacia excelsa, Xanthorrhoea johnsonii, Melaleuca viridiflora, Notelaea microcarpa, Persoonia falcata* and *Petalostigma pubescens* the most frequent species. The sparse ground layer includes the graminoids *Thyridolepis mitchelliana, Paspalidium constrictum, Themeda triandra, Cymbopogon refractus, Eragrostis lacunaria, Panicum effusum, Chrysopogon fallax, Aristida muricata, A. holathera, A. caput-medusae, A. calycina* var*. calycina, Digitaria brownii, Cyperus gracilis, Heteropogon contortus, Schizachyrium fragile, Ancistrachne uncinulata, Eremochloa bimaculata, Enneapogon pallidus,* and *Eragrostis sororia.* Frequent forbs include *Chenopodium desertorum* subsp*. anidiophyllum, Sclerolaena birchii, Sida* spp*., Boerhavia dominii, Evolvulus alsinoides, Phyllanthus* spp*.* and *Einadia nutans* subsp*. nutans.*

Table 61 Five most extensive regional ecosystems included in BVG 20a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.10.9	*Callitris glaucophylla* woodland on coarse-grained sedimentary rocks	513,205	378,846	74	NC
11.3.19	*Callitris glaucophylla, Corymbia* spp. and/or *Eucalyptus melanophloia* open forest to woodland on Cainozoic alluvial plains	237,952	91,218	38	NC
11.10.6	*Angophora leiocarpa, Callitris glaucophylla* open woodland on coarse-grained sedimentary rocks.	148,703	143,437	96	NC
6.3.17	*Callitris glaucophylla, Corymbia tessellaris, Acacia excelsa* ± *C. clarksoniana* open woodland on old alluvial dunes and sand plains	105,142	45,586	43	OC
6.3.16	*Callitris glaucophylla, Acacia excelsa, Geijera parviflora* ± *A. aneura* woodland on dunes	97,343	84,800	87	OC

Callitris spp. are frequently present in the subcanopy of a number of eucalypt dominated REs. *Callitris glaucophylla* occurs in REs in BVG12a, 17a, 17b, 18a and 18b. *Callitris* spp. density can be impacted by fire history and previous management. BVG20a represents the REs where *Callitris* spp. are generally dominant or codominant in the canopy.

Photo 220 *Angophora leiocarpa* open woodland, 11.10.6. North of Mitchell, BRB.
(VJ Neldner)

Photo 221 *Callitris glaucophylla, Acacia excelsa* and *Alsonia constricta* woodland, on sand dunes, 6.3.16. Near Cunnamulla, MUL.
(VJ Neldner)

21 *Melaleuca* spp. dry woodlands to open woodlands on sandplains or depositional plains

21a Low woodlands and low open woodlands dominated by *Melaleuca viridiflora* (coarse-leaved paperbark) on depositional plains

Pre-clearing area: 4,738,239 ha

Remnant 2017 area: 4,616,089 ha (97.4% of pre-clearing)

Bioregions: GUP (60%), CYP (34%), BRB (2%), CQC (2%), EIU (1%), WET (1%), SEQ (1%), DEU (0.4%), NWH (0.2%)

Land zones: 3 (59%), 5 (40%), 11 (1%), 7, 12, 2 (minor)

Mean annual rainfall range: 600-2000 mm

Typical landforms: Alluvial plains, and flat to gently undulating sandplains

Typical soils: Redoxic Hydrosols

Structural formation range: Woodland, low woodland to low-open woodland

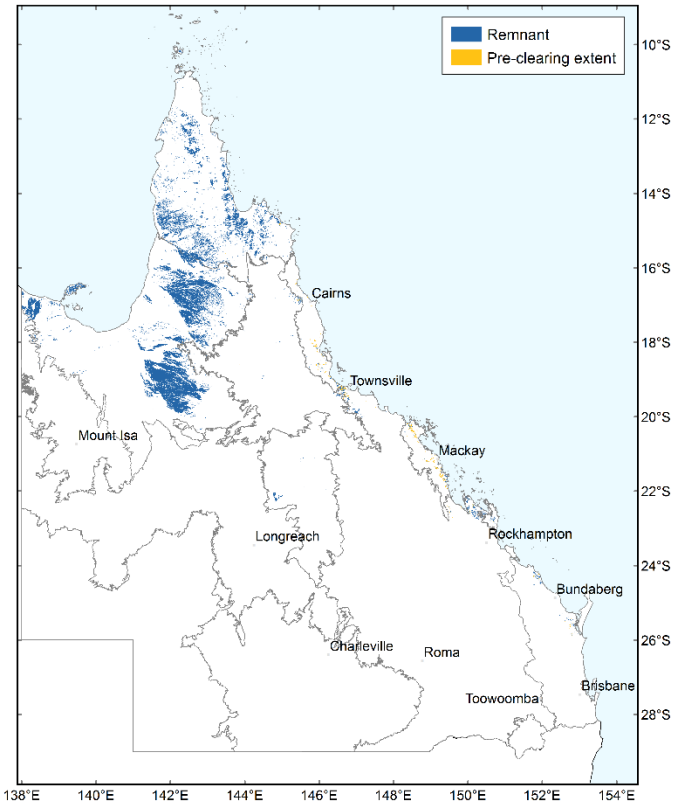


Photo 222 *Melaleuca viridiflora* low open woodland, 3.3.49b. Near Coen, CYP.
(JR Clarkson)

Floristic characteristics: *Melaleuca viridiflora* dominates the sparse to very sparse canopy. *Corymbia clarksoniana* and less often *C. dallachiana* or *C. polycarpa* may be present as emergent trees. The low tree/shrub layer is generally very sparse, and most frequently composed of *M. viridiflora, M. stenostachya, Grevillea glauca, G. parallela, Petalostigma banksii, P. pubescens* and *Acacia leptocarpa.* The mid-dense ground layer is frequented by the graminoids *Themeda triandra, Eremochloa bimaculata, Schizachyrium fragile, Alloteropsis*

semialata, Eriachne spp*., Aristida* spp*., Heteropogon triticeus, H. contortus, Ectrosia leporina, Sarga plumosum, Fimbristylis dichotoma, F. cinnamometorum, Chrysopogon fallax, Paspalidium distans, Eragrostis brownii* and *Paspalum scrobiculatum.* The most frequent forbs are *Phyllanthus virgatus, Drosera petiolaris, Spermacoce* spp*., Rhynchosia* spp*., Desmodium* spp*., Xyris* spp*., Velleia spathulata, Xanthorrhoea johnsonii, Crotalaria montana, Brunoniella acaulis, Goodenia pilosa* and *Lomandra longifolia.*

Table 62 Five most extensive regional ecosystems included in BVG 21a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.49	*Melaleuca viridiflora +/- Corymbia clarksoniana* low open woodland on floodplains and alluvial plains	1,116,447	1,113,489	100	NC
2.5.14a	*Melaleuca viridiflora ± Melaleuca citrolens, Melaleuca stenostachya, Acacia leptostachya, Erythrophleum chlorostachys* low woodland on broad, gently undulating Tertiary sand sheets.	693,815	693,432	100	NC
2.5.14c	*Melaleuca viridiflora +/- M. citrolens, Asteromyrtus symphyocarpa* low open woodland on Tertiary sand sheets in the north-east	655,422	654,791	100	NC
2.3.29c	*Melaleuca viridiflora +/- Melaleuca citrolens, M. stenostachya* low woodland with emergent eucalypts on old alluvial plains (recent Pleistocene surface) in the north-east	410,323	409,988	100	NC
2.3.29a	*Melaleuca viridiflora +/- Melaleuca citrolens, M. stenostachya* low woodland with emergent eucalypts on active Quaternary alluvial plains and depressions in the north-east	352,738	352,081	100	NC

The broad leaf tea-tree (*Melaleuca viridiflora*) woodlands in high rainfall coastal north Queensland which is listed as endangered under the *EPBC Act* includes regional ecosystems 7.3.8a, 7.3.8b, 7.3.8c, 7.3.8d, 7.5.4g, 8.3.2, 8.5.2a, 8.5.2c and 8.5.6 from this BVG.

Photo 223 *Melaleuca viridiflora* low woodland with emergent *Cochlospermum gregorii* on sand plain, 2.5.14c. Kutchera Station, GUP.
(CN Appelman)

Photo 224 Grass fire in *Melaleuca viridiflora* low woodland on alluvial plain, 3.3.49b. North of Hann River, CYP. (MR Newton)

21b Low open woodlands and tall shrublands of *Melaleuca citrolens* or *M. stenostachya* or other *Melaleuca* spp.

Pre-clearing area: 2,442,430 ha

Remnant 2017 area: 2,422,540 ha (99.2% pre-clearing)

Bioregions: GUP (76%), CYP (13%), EIU (8%), DEU (2%), BRB (1%), SEQ (0.2%), NWH (0.1%)

Land zones: 5 (62%), 3 (20%), 7 (10%), 10 (4%), 11 (4%), 12 (1%), 9, 8 (minor)

Mean annual rainfall range: 600-1200 mm

Typical landforms: Flat to gently undulating plains, sandplains and drainage areas. Also lateritic erosional slopes and breakaways.

Typical soils: Redoxic Hydrosols, Yellow Kandosols

Structural formation range: Woodland, low open woodland, to tall shrubland

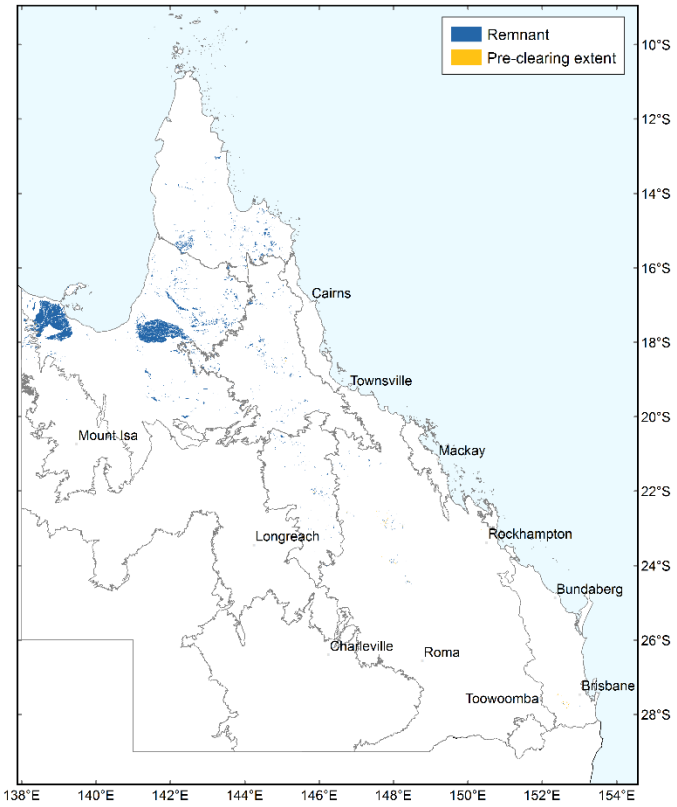


Photo 225 *Melaleuca citrolens* and *Eucalyptus pruinosa* low open woodland on sandy alluvial deposits, 2.5.33c. Escott Station, GUP.

(HA Dillewaard)

Floristic characteristics: *Melaleuca citrolens* dominates large areas of low woodland, sometimes with *M. viridiflora* or *M. foliolosa.* Other low woodlands maybe dominated by *M. stenostachya,* or *Melaleuca acacioides* or *M. tamariscina* or *M. monantha.* Sparse *Terminalia platyptera, Corymbia* spp. and *Eucalyptus* spp. may also be present in the low canopy or as emergent trees. *M. bracteata, M. saligna* and *M. irbyana* can dominate in seasonally inundated areas. *Petalostigma banksii, Asteromyrtus symphyocarpa, Grevillea parallela* and *G. striata* may be present as low trees. *Carissa lanceolata, Gardenia vilhelmii, Dolichandrone heterophylla, Hakea pedunculata* and *Denhamia cunninghamii* are frequent in the very sparse shrub layer. The sparse ground layer is dominated by the graminoids *Schizachyrium fragile, Heteropogon contortus, Chrysopogon fallax, Sarga plumosum, Themeda triandra, Chloris lobata* and species of *Digitaria, Aristida, Fimbristylis, Eragrostis, Eriachne, Panicum* and *Rhynchospora.* The most frequent forbs are *Evolvulus alsinoides, Polycarpaea corymbosa*

Oldenlandia mitrasacmoides, Buchnera linearis, Cheilanthes spp.*, Spermacoce* spp. and *Phyllanthus* spp.

Table 63 Five most extensive regional ecosystems included in BVG 21b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.5.30	*Melaleuca spp., Lysiphyllum cunninghamii and Terminalia* spp. in mixed low woodlands on Tertiary sand sheets.	421,427	421,071	99	NC
2.5.33c	*Melaleuca citrolens and/or Eucalyptus pruinosa* and/or *M. viridiflora +/- E. tectifica* low open woodland on old alluvial plains (early Pleistocene surface)	400,308	399,941	100	NC
2.5.17b	*Melaleuca citrolens +/- M. viridiflora, Eucalyptus microneura, Terminalia platyptera* low open woodland on Tertiary sand sheets	287,779	287,618	100	NC
2.5.17a	*Melaleuca stenostachya and/or M. citrolens +/- Eucalyptus microneura, E. provecta* low woodland on erosional Tertiary sand sheets	157,101	155,967	99	NC
2.5.33a	*Melaleuca citrolens +/- M. viridiflora, Asteromyrtus symphyocarpa, Terminalia canescens* low woodland on sand sheets on broad, Tertiary lateritic surfaces	134,417	134,375	100	NC

The Swamp Tea-tree (*Melaleuca irbyana*) Forest of Southeast Queensland which is listed as critically endangered under the *EPBC Act* includes regional ecosystems 12.3.18 and 12.9-10.11 from this BVG.

Photo 226 *Melaleuca citrolens* and *Grevillea pteridifolia* low woodland on an alluvial flat, 3.3.52a. South of Laura, CYP. (MR Newton)

Photo 227 *Melaleuca citrolens* low open woodland with a sparse ground of *Aristida* spp., *Eriachne* spp. and *Schizachyrium* spp. on sandy soils, 9.12.40. North of Walsh River crossing, EIU. (GW Wilson)

Photo 228 *Melaleuca citrolens, M. stenostachya* and *Lysiphyllum cunninghamii* low woodands with emergent *Corymbia confertiflora*, 2.5.15x3. Oak Park Station, GUP. (HA Dillewaard)

22 *Melaleuca* spp. open forests and woodlands on seasonally inundated lowland coastal swamps and fringing drainage lines (Palustrine wetlands)

22a Open forests and woodlands dominated by *Melaleuca quinquenervia* (swamp paperbark) in seasonally inundated lowland coastal areas and swamps

Pre-clearing area: 174,753 ha

Remnant 2017 area: 81,809 ha (46.8 % of pre-clearing)

Bioregions: SEQ (80%), WET (17%), CQC (2%), CYP (0.5%), BRB (0.3%)

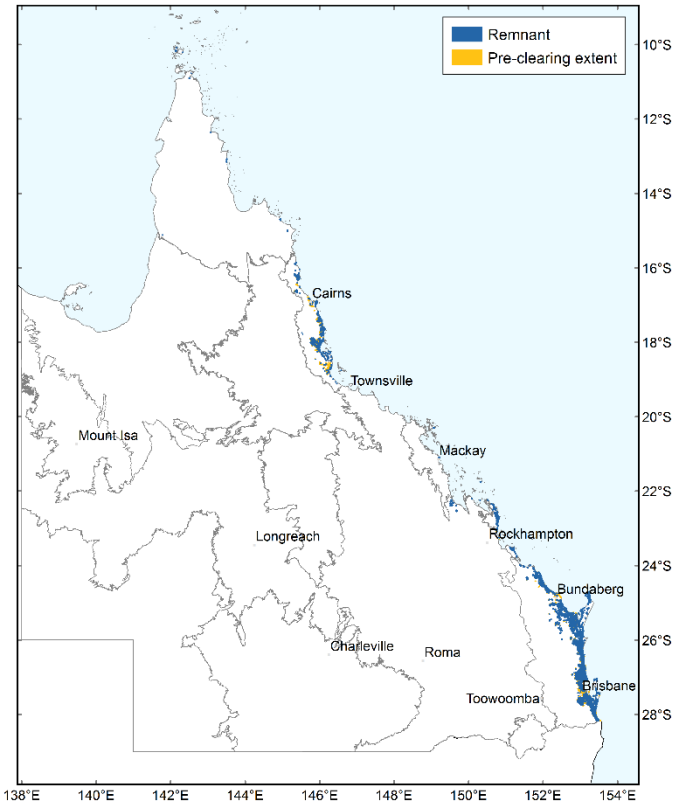
Land zones: 3 (77%), 2 (23%)

Mean annual rainfall range: 1200-8000 mm

Typical landforms: Coastal alluvial plains and sand plains, and dune swales

Typical soils: Redoxic Hydrosols and Aquic Podosols

Structural formation range: Open forest to woodland



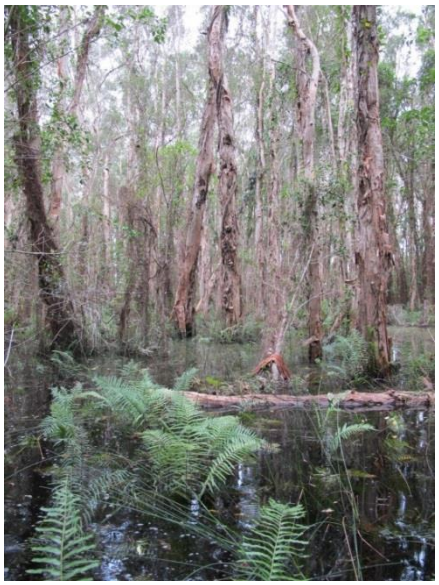


Photo 229 *Melaleuca quinqinervia* open forest, 12.3.5, Winfield, SEQ.
(C. Pennay)

Photo 230 *Melaleuca quinqinervia* open forest, 12.3.4, Brown Lake, North Stradbroke Island, SEQ.
(KM Stephens)

Floristic characteristics: *Melaleuca quinquenervia* dominates the mid-dense canopy. Occasionally *Lophostemon suaveolens, Eucalyptus tereticornis, Casuarina glauca* or *Corymbia intermedia* may be present in the canopy. Sparse shrubs are sometimes present and may include *Acacia leiocalyx, A. disparrima* subsp*. disparrima, Alphitonia excelsa, Glochidion sumatranum, Banksia robur, Melastoma malabathricum* subsp*. malabathricum* or *Cupaniopsis anacardioides.* The mid-dense ground layer is usually dominated by the graminoids *Imperata cylindrica, Themeda triandra, Paspalum scrobiculatum, Lepironia articulata, Leersia hexandra, Entolasia marginata, Baumea rubiginosa, Cyperus polystachyos, Schoenus brevifolius, Lomandra longifolia, Baloskion pallens, Phragmites australis* and *Dianella caerulea.* Frequent forbs include *Blechnum indicum, Parsonsia straminea, Pteridium esculentum, Lygodium microphyllum* and *Centella asiatica.*

Table 64 Five most extensive regional ecosystems included in BVG 22a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
12.3.5	*Melaleuca quinquenervia* open forest on coastal alluvium	44,728	19,914	45	OC
12.3.6	*Melaleuca quinquenervia, Eucalyptus tereticornis, Lophostemon suaveolens* open forest on coastal alluvial plains	32,063	12,575	39	NC
12.2.7	*Melaleuca quinquenervia* or rarely *M. dealbata* open forest on sand plains	30,447	18,023	59	OC
7.3.5a	*Melaleuca quinquenervia* open forest, woodland and shrubland, on poorly drained alluvial plains	23,611	10,776	46	E
12.3.4	*Melaleuca quinquenervia, Eucalyptus robusta* woodland on coastal alluvium	17,257	8,054	47	OC

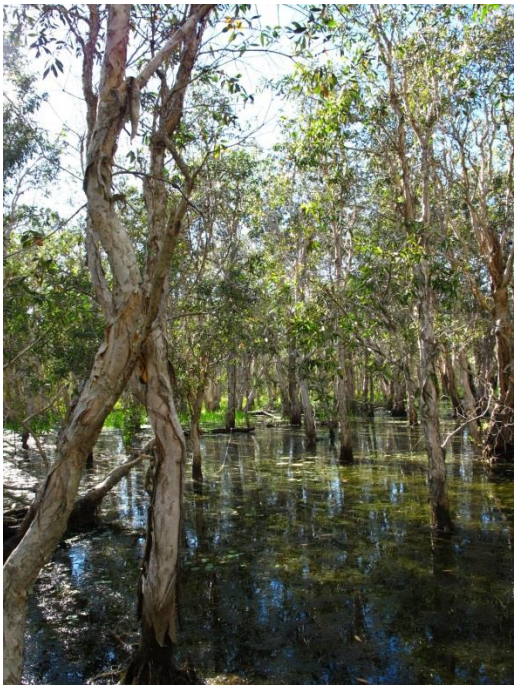


Photo 231 *Melaleuca quinqinervia* open forest wetland, 8.3.13a. Werribee State Forest, CQC.
(C Pennay)

Photo 232 *Melaleuca quinqinervia* open forest, 12.3.6. West of Maryborough, SEQ.
(TS Ryan)

22b Open forests and low open forests dominated by *Melaleuca* spp. (*M. viridiflora, M. saligna*, *M. leucadendra* (broad-leaved tea-tree), *M. clarksonii* or *M. arcana* (winti)) in seasonally inundated swamps

Pre-clearing area: 119,416 ha

Remnant 2017 area: 102,897 ha (86.2% of pre-clearing)

Bioregions: CYP (60%), GUP (16%), CQC (10%), WET (8%), BRB (5%), DEU (2%)

Land zones: 3 (79%), 2 (20%), 1 (1%)

Mean annual rainfall range: 600-2000 mm

Typical landforms: Drainage depressions and swamps on alluvial plains or dunes

Typical soils: Redoxic Hydrosols

Structural formation range: Open forest to woodland

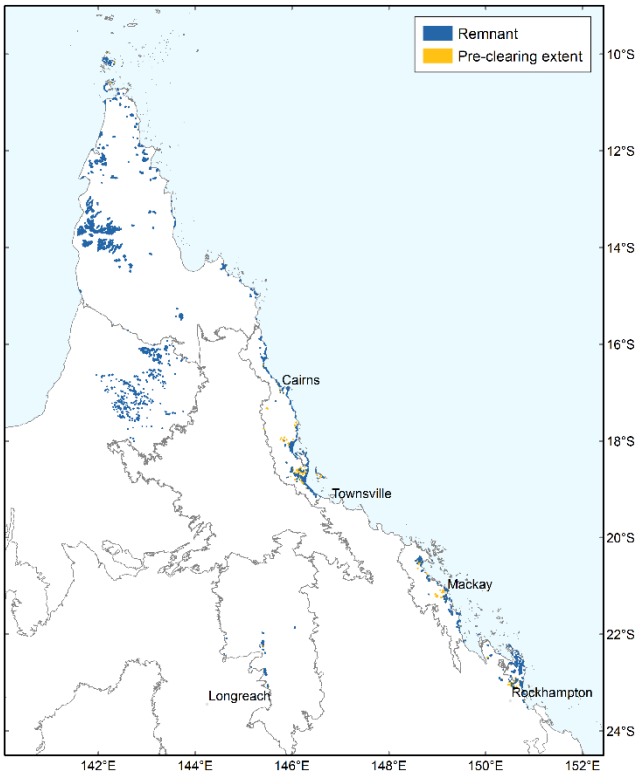


Photo 233 *Melaleuca clarksonii* woodland in depression, 3.3.41. Alice River, CYP. (VJ Neldner)

Floristic characteristics: *Melaleuca leucadendra* or *M. quinquenervia* or *M. saligna* dominate open forests in coastal situations, *M. viridiflora* or *M. clarksonii* dominate in inland situations. *M. dealbata* is dominant in dune swales, while *M. arcana* dominates in dune swamps on southern CYP. *Lophostemon suaveolens* may dominate some coastal swamps, and *Eucalyptus robusta, Corymbia tessellaris* and *C. clarksoniana* are sometimes present in the canopy. *Asteromyrtus symphyocarpa* and *Livistona decora* are sometimes present as subcanopy trees. *Baeckea frutescens, Banksia robur, B. dentata, Calycopeplus casuarinoides, Leptospermum polygalifolium* and *Thryptomene oligandra* are sometimes present as very sparse shrubs. Frequent graminoids in the mid-dense ground layer include *Imperata cylindrica, Leersia hexandra, Schoenus sparteus, Cyperus haspan* subsp. *juncoides, Paspalum scrobiculatum, Sporobolus virginicus, Gahnia sieberiana, Pseudoraphis spinescens, Paspalidium distans* and species of *Scleria, Eragrostis* and *Fimbristylis.* Frequent forbs include *Blechnum indicum, Gymnanthera oblonga, Centella asiatica, Ludwigia octovalvis* and *Acrostichum speciosum.*

Table 65 Five most extensive regional ecosystems included in BVG 22b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.9	*Lophostemon suaveolens* woodlands on creek lines and swamps	48,220	48,158	100	NC
2.3.55a	*Melaleuca viridiflora* and/or *Melaleuca clarksonii +/- Asteromyrtus symphyocarpa* low woodland in seasonal swamps on Tertiary sand sheets in the north-east	14,282	14,282	100	NC
8.3.13a	*Melaleuca quinquenervia* and/or *M. leucadendra* woodland on alluvial plains or marine plains	10,357	4,215	41	OC
3.2.3	*Melaleuca dealbata or Lophostemon suaveolens* open forest in dune swales	9,698	9,670	100	OC
3.3.67	*Melaleuca arcana* open heath to dwarf shrubland in swamps	7,975	7,975	100	OC

Photo 234 *Melaleuca saligna* open woodland on shallow depression, 3.3.14a, Oriners Station, CYP.
(MJ Spry, DNRM)

Photo 235 *Melaleuca viridiflora* low woodland on a lagoon, 2.3.28x15. Staaten River NP, GUP.
(GW Wilson)

22c Open forests dominated by *Melaleuca* spp. (*M. argentea* (silver tea-tree), *M. leucadendra* (broad-leaved tea-tree), *M. dealbata* (swamp tea-tree) or *M. fluviatilis*), fringing major streams with *Melaleuca saligna* or *M. bracteata* (black tea-tree) in minor streams

Pre-clearing area: 581,460 ha

Remnant 2017 area: 541,664 ha (93.2% of pre-clearing)

Bioregions: CYP (28%), GUP (27%), EIU (21%), BRB (15%), CQC (4%), DEU (2%), (2%), WET (2%), NWH (1%), SEQ (minor)

Land zone: 3 (100%)

Mean annual rainfall range: 800-3000 mm

Typical landforms: Major streams and channels in the northern bioregions

Typical soils: Rudosols and Leptic Tenosols

Structural formation range: Fringing open forest to woodland

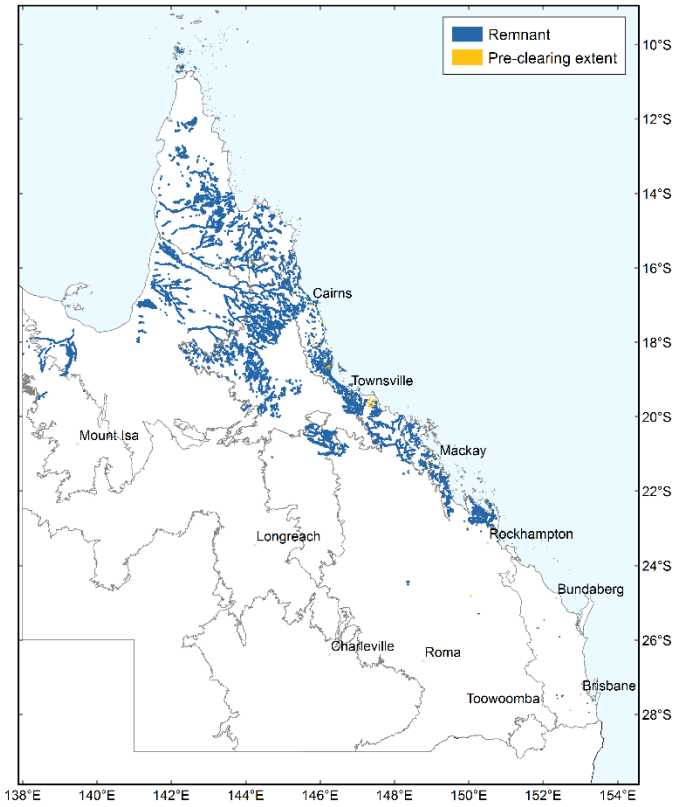


Photo 236 *Melaleuca fluviatilis* lined sandy river bed, 9.3.13. Copperfield River crossing east of Kidston Mine, EIU.
(MR Newton)

Floristic characteristics: *Melaleuca leucadendra* and/or *M. fluviatilis* dominate the mid-dense canopy. *Lophostemon suaveolens, L. grandiflorus, Nauclea orientalis, Casuarina cunninghamiana* and *Acacia auriculiformis* are frequently present in the canopy. Very sparse *Corymbia tessellaris* and *Eucalyptus camaldulensis* or *E. tereticornis* may be part of the

canopy or emergent trees. A very sparse shrub/ low tree layer of *Ficus opposita, Acacia holosericea, Alphitonia excelsa, Planchonia careya, Atalaya hemiglauca, Barringtonia acutangula* and *Scolopia braunii* is sometime present. The ground layer is mid-dense and dominated by *Heteropogon contortus, Cyperus aquatilis, Eragrostis* spp*., Paspalidium distans, Arundinella nepalensis, Panicum trichoides, Bothriochloa bladhii, Oplismenus aemulus, Sarga plumosum, Imperata cylindrica* and *Paspalum scrobiculatum.* Frequent forbs include *Nelsonia campestris, Achyranthes aspera, Lomandra longifolia, Cyanthillium cinereum, Eustrephus latifolius, Phyllanthus virgatus, Dianella caerulea* and *Ludwigia octovalvis.*

Table 66 Five most extensive regional ecosystems included in BVG 22c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.10	*Melaleuca fluviatilis* and/or *Melaleuca argentea* woodland *or M. saligna* or *M. dealbata* woodland fringing watercourses	159,250	158,909	100	NC
2.3.24a	*Melaleuca fluviatilis* and/or *M. leucadendra* and/or *M. argentea, Eucalyptus camaldulensis* ± *Nauclea orientalis* woodland on fringes and in channels of major watercourses.	110,270	109,721	100	OC
9.3.13	*Melaleuca* spp., *Eucalyptus camaldulensis* and *Casuarina cunninghamiana* fringing open forest on streams and channels	103,713	101,817	98	OC
11.3.25b	*Melaleuca leucadendra* and/or *M. fluviatilis, Nauclea orientalis, Pandanus tectorius, Eucalyptus tereticornis, Casuarina cunninghamiana, Lophostemon suaveolens* and rainforest species	77,513	61,515	79	OC
2.3.52	*Melaleuca spp., Eucalyptus camaldulensis, Lophostemon grandiflorus* and *Livistona rigida* in mixed woodlands fringing major spring-fed watercourses	28,577	28,562	100	OC

Photo 237 *Melaleuca argentea* and *M. leucadendra* open forest, 3.3.10a. King River, King Junction station, CYP.
(MR Newton)

Photo 238 *Melaleuca leucadendra* and *Lophostemon suaveolens* open forest with riparian rainforest understorey, 8.3.3a. Shoalwater Bay Training Area, CQC.
(JM Brushe)

23 *Acacia aneura* (mulga) woodlands to tall open shrublands on red earth plains, sandplains or residuals

23a Woodlands to low woodlands dominated by *Acacia aneura* on red earth plains or sandplains (soft mulga)

Pre-clearing area: 7,611,960 ha

Remnant 2017 area: 5,421,618 ha (71.2% of pre-clearing)

Bioregions: MUL (79%), CHC (14%), MGD (3%), BRB (3%), NWH (1%)

Land zones: 5 (81%), 6 (16%), 3 (3%)

Mean annual rainfall range: 200-600 mm

Typical landforms: Flat sand plains, run-on areas and sand dunes

Typical soils: Red Kandosols

Structural formation range: Open forest in the east, ranging through to tall open shrubland in the west. The structural form and height reduces, as annual rainfall decreases.

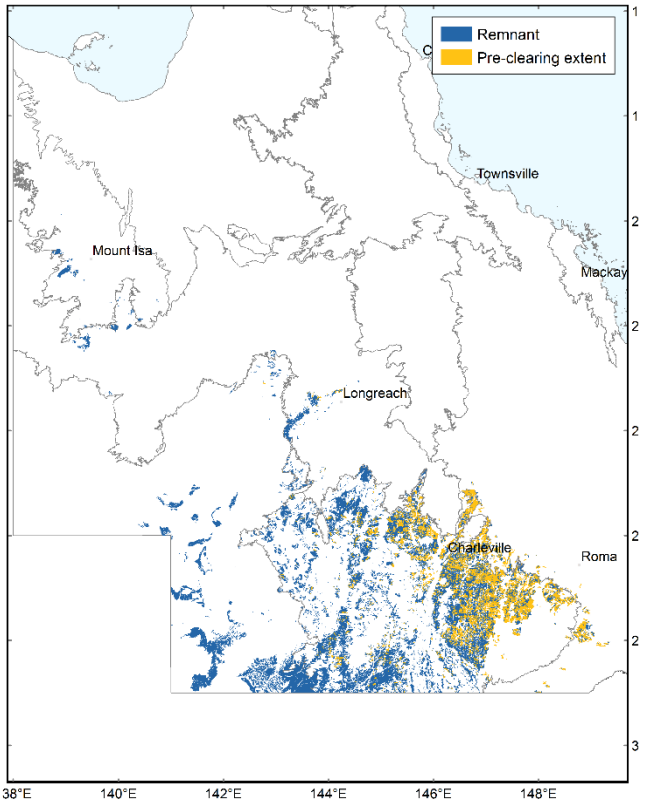


Photo 239 *Acacia aneura* tall shrubland on red earth, 6.5.7. Near Bollon, MUL.
(VJ Neldner)

Floristic characteristics: The dominant layer is mostly dominated by *Acacia aneura* in either a tree or shrub lifeform. *Eucalyptus populnea*, *E. melanophloia* or *E. intertexta* or *Corymbia terminalis* or *C. aparrerinja* may be present in the canopy or occur as scattered emergent trees. In some cases *A. aneura* is co-dominant with *Atalaya hemiglauca* (whitewood), *Archidendropsis basaltica* (eastern dead-finish) or other tree species. A sparse to open shrub layer is often present with *Eremophila, Acacia* and *Senna* species frequent. The ground layer is generally dominated by the tussock grasses *Thyridolepis mitchelliana, Paraneurachne muelleri, Digitaria brownii,* and species of *Aristida, Enneapogon* and *Eragrostis. Triodia*

pungens may dominate in some areas. Frequent forbs are *Sida platycalyx, Solanum quadriloculatum, Abutilon otocarpum, Evolvulus alsinoides, Heliotropium tenuifolium*, *Sclerolaena cornishiana, Sida filiformis, Bonamia media* and *Cheilanthes sieberi*.

Table 67 Five most extensive regional ecosystems included in BVG 23a.

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.6.4	*Atalaya hemiglauca* ± *Acacia aneura* ± *Acacia* spp. ± *Corymbia terminalis* tall open shrubland on sand dunes	1,056,449	1,056,310	100	NC
6.5.7	*Acacia aneura, Eucalyptus populnea* ± *E. intertexta* low woodland on run-on areas	837,476	487,832	58	NC
6.5.1	*Acacia aneura, Eucalyptus populnea, E. melanophloia* open forest on undulating lowlands	734,743	259,698	35	OC
6.5.15a	*Acacia aneura* and *Eucalyptus populnea* tall open shrubland on sand plains	620,114	533,543	86	NC
6.5.2	*Eucalyptus populnea, Acacia aneura* and/or *E. melanophloia* woodland on Quaternary sediments	597,785	190,638	32	NC

Photo 240 *Acacia aneura* open forest with *Eucalyptus melanophloia* and *E. populnea* emergents, 6.5.1. NE of St George, MUL. (VJ Neldner)

Photo 241 *Acacia aneura* and *Eucalyptus melanophloia* open forest on red earth, 6.5.2. South of Mitchell, MUL. (VJ Neldner)

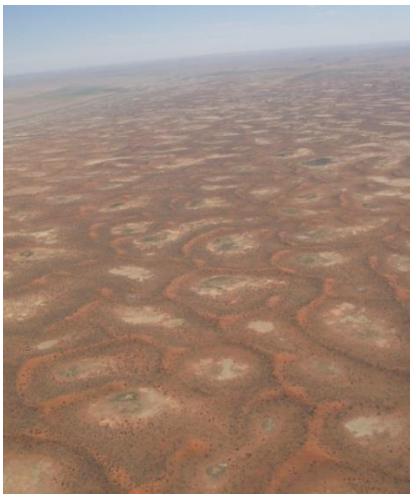


Photo 242 Reticulated dune fields of *Atalaya hemiglauca* and *Acacia aneura* tall open shrubland, 5.6.4. Near Lake Cuddapan, CHC. (N Cuff)

Photo 243 *Acacia aneura* with *Corymbia aparrerinja* tall shrubland on sandplain, 5.5.1. Near Windorah, CHC. (VJ Neldner)

23b Tall shrublands to low open woodlands dominated by *Acacia aneura* on shallow red earth plains (hard mulga)

Pre-clearing area: 5,063,056 ha

Remnant 2017 area: 4,699,594 ha (92.8% of pre-clearing)

Bioregions: MUL (65%), CHC (28%), MGD (7%), DEU (0.1%), BRB, NWH (minor)

Land zones: 7 (68%), 5 (32%)

Mean annual rainfall range: 300-600 mm

Typical landforms: Residual plateaus and shallow sand sheets

Typical soils: Red Kandosols and Rudosols

Structural formation range: Predominantly tall shrublands through to tall open shrublands. Some low open woodlands and open tussock grasslands in some areas

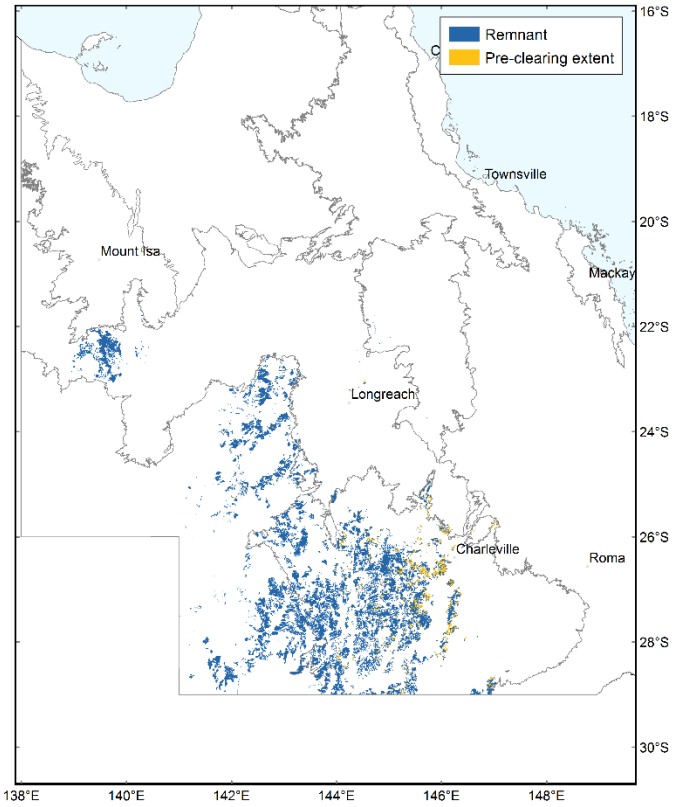


Photo 244 *Acacia aneura* tall open shrubland with *Triodia burkensis* understorey, 4.5.3.

De Little Range, MGD.

(VJ Neldner)

Floristic characteristics: The dominant layer is mostly dominated by *Acacia aneura* tall shrubs. *Acacia sibirica* or *A. clivicola* (bastard mulga) are frequently present in the canopy together with *Eremophila latrobei. Eucalyptus populnea* (poplar box), *E. melanophloia* (silverleaf ironbark) or *Corymbia terminalis* (western bloodwood) may be present as scattered emergent trees. A sparse to open shrub layer is often present with *Eremophila, Acacia* and *Senna* species frequently being present. The ground layer is generally dominated by sparse tussock grasses of *Aristida, Digitaria, Eragrostis, Enneapogon, Eriachne* and *Panicum* species, *Dactyloctenium radulans*, *Tripogon loliiformis* and in places, *Triodia pungens*. Frequent forbs

include *Sida filiformis, Evolvulus alsinoides, Hibiscus burtonii, Calotis xanthosioidea, C. cuneifolia, Euphorbia drummondii, Phyllanthus virgatus, Portulaca australis, Streptoglossa odora, Abutilon otocarpum* and *Cheilanthes sieberi.*

Table 68 Five most extensive regional ecosystems included in BVG 23b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
6.7.12	*Acacia aneura* ± *Eucalyptus populnea* ± *E. melanophloia* ± *Eremophila gilesii* tall shrubland on residuals	1,457,984	1,199,856	82	NC
6.7.9	*Acacia aneura* ± *A. clivicola* ± *Eremophila latrobei* tall open shrubland on residuals	1,391,590	1,347,167	97	NC
5.5.2	*Acacia aneura* ± *Acacia sibirica* ± *Eremophila latrobei* tall shrubland on Quaternary deposits	876,146	875,083	100	NC
5.5.1	*Acacia aneura* low woodland on Quaternary deposits	434,937	429,632	99	OC
6.7.17	*Eriachne mucronata* open grassland wooded with *Acacia aneura* and/or *Corymbia terminalis* on plains or flat tops of residuals	288,830	276,940	96	NC

Photo 245 *Acacia aneura* low woodland on gently undulating terrain, 10.7.6x2. Towerhill Station, south of Prairie, DEU. (EJ Thompson)

Photo 246 *Eriachne mucronata* open tussock grassland withscattered *Corymbia terminalis* trees, 6.7.17a. West of Charleville , MUL. (VJ Neldner)

24 *Acacia* spp. low woodlands to tall shrublands on residuals. Species include *A. clivicola/ A. sibirica* (bastard mulga), *A. shirleyi* (lancewood), *A. microsperma* (bowyakka), *A. catenulata* (bendee), *Acacia rhodoxylon* (rosewood)

24a Low woodlands to tall shrublands dominated by *Acacia* spp. on residuals. Species include *A. shirleyi* (lancewood), *A. catenulata* (bendee), *A. microsperma* (bowyakka), *A. clivicola*, *A. sibirica* (bastard mulga), *A. rhodoxylon* (rosewood) and *A. leptostachya* (Townsville wattle)

Pre-clearing area: 7,073,162 ha

Remnant 2017 area: 6,594,089 ha (93.2% of pre-clearing)

Bioregions: MUL (30%), CHC (28%), BRB (16%), GUP (12%), MGD (5%), EIU (5%), DEU (3%), NWH (2%), CYP, CQC, SEQ (minor)

Land zones: 7 (71%), 10 (15%), 5 (9%), 12 (3%), 11 (2%), 3,4 (minor)

Mean annual rainfall range: 300-1200 mm

Typical landforms: Crests and scarps of residual ranges.

Typical soils: Shallow, rocky Rudosols

Structural formation range: Low woodland to tall shrubland

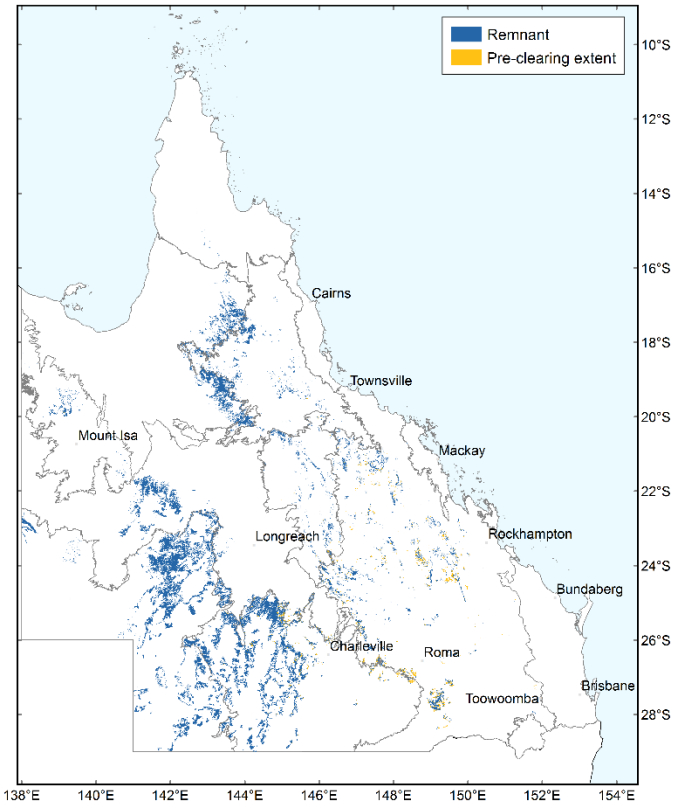


Photo 247 *Acacia shirleyi* low open woodland with *Triodia* sp. on scarp slopes, 5.7.2. Lark Quarry near Winton, CHC. (D Richter)

Floristic characteristics: The canopy tends to be dominated by one or two species at a location. Dominant species include *Acacia shirleyi*, *A. catenulata*, *A. microsperma*, *A. clivicola, A. sibirica, A. petraea, A. ensifolia, A. rhodoxylon* and *A. leptostachya*. Frequently occasional

emergent *Eucalyptus thozetiana* or *E. exserta* may be present. A sparse to open shrub layer is often present, with a very sparse ground layer, sometimes consisting of *Triodia* species.

Table 69 Five most extensive regional ecosystems included in BVG 24a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
6.7.14	*Acacia clivicola* ± *Eucalyptus* spp. open shrubland on crests and tops of residuals	977,898	953,268	97	NC
5.7.5	*Acacia sibirica* open shrubland with *Triodia* spp. ± *Acacia aneura* ± *Acacia shirleyi* open shrubland on crests and tops of ranges	862,563	861,933	100	NC
11.7.2	*Acacia* spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	564,696	365,950	65	NC
5.5.4	*Acacia sibirica* +/- *Acacia aneura* +/- *Eucalyptus* spp. open shrubland on Quaternary sediments	497,373	497,183	100	NC
6.7.7	*Acacia catenulata* ± *Eucalyptus thozetiana* and/or *A. ensifolia* low open woodland with *Triodia* spp. and/or *A. petraea* ± *A. aneura* on scarps and plateaus	439,820	412,554	94	NC

Photo 248 *Acacia clivicola* with emergent *Acacia aneura* open shrubland on residual, 6.7.14. NE of Jundah, MUL. (VJ Neldner)

Photo 249 *Acacia petraea* with *Triodia longiceps* low open woodland, 6.7.7a. West of Jundah, MUL. (VJ Neldner)

Photo 250 *Acacia sibirica* open shrubland with emergent *Corymbia aparrerinja* and *A. aneura*, 5.7.5. Near Flodden Hills, CHC. (D Richter)

Photo 251 *Acacia catenulata, Eucalyptus bakeri* and *E. exserta* woodland, 11.7.2. Thomby Range, east of Surat, BRB. (VJ Neldner)

24b Open shrublands dominated by *Senna* spp. on calcareous residuals

Pre-clearing area: 476,833 ha

Remnant 2017 area: 476,654 ha (100% of pre-clearing)

Bioregions: MGD (57%), CHC (37%), NWH (5%)

Land zones: 9 (90%), 7 (10%)

Mean annual rainfall range: Predominantly 300-500 mm

Typical landforms: Flat to gently undulating tabletops, residuals and foot slopes of limestone deposits

Typical soils: Calcarosols and Rudosols

Structural formation range: Shrubland to open shrubland

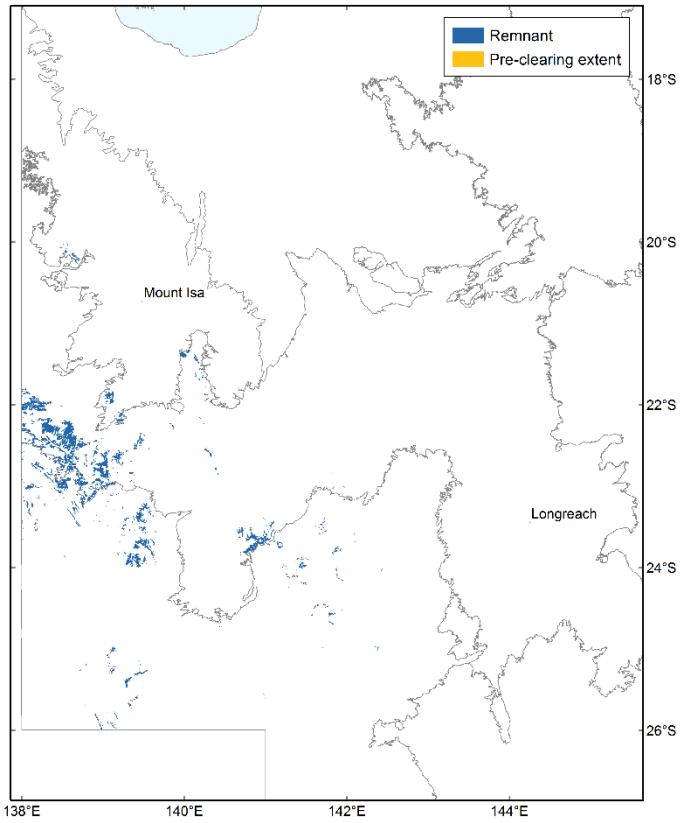


Photo 252 *Senna* spp. open shrubland on limestone ranges, 5.9.1. Hunters Gorge, Diamantina NP, CHC.
(VJ Neldner)

Floristic characteristics: *Senna artemisioides* subsp*. helmsii,* and/or *S. artemisioides* subsp*. oligophylla,* and/or *Senna artemisioides* subsp*. sturtii* dominate the sparse shrub canopy. *Gossypium australe, Acacia tetragonophylla, A. bivenosa, Carissa lanceolata,* and *Eremophila latrobei* subsp*. glabra* are frequently present in the shrub layer. Occasional low trees of *Corymbia terminalis, Ventilago viminalis, Acacia georginae* and *Atalaya hemiglauca* may be present as emergents. The ground layer is either dominated by *Triodia longiceps,* or sparse tussock grasses of *Enneapogon polyphyllus, Panicum decompositum* var*. decompositum, Aristida latifolia, A. longicollis, A. contorta* and *A. holathera.* The most frequent forbs are *Heliotropium tenuifolium, Melhania oblongifolia, Salsola australis, Scaevola ovalifolia, Sida filiformis, Solanum quadriloculatum, Evolvulus alsinoides, Trichodesma zeylanicum* var*. zeylanicum, Abutilon leucopetalum, Hybanthus aurantiacus* and *Indigofera linifolia.*

Table 70 Five most extensive regional ecosystems included in BVG 24b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.9.13b	*Senna artemisioides* subsp. *helmsii, S. artemisioides* subsp. *oligophylla, Eremophila spp., Acacia bivenosa, A. sibirica* shrublands on undulating Cambrian limestone and dolomites	189,934	189,844	100	NC
4.9.13d	*Senna* spp., *Eremophila* spp. and *Acacia* spp. in mixed shrublands on Tertiary limestones and mudstones around the Diamantina River	82,702	82,697	100	NC
5.9.1	*Senna* spp., *Eremophila* spp. +/- *Acacia* spp. +/- *Maireana* spp. open shrublands on fresh Cretaceous or Tertiary limestones	73,540	73,540	100	NC
5.7.10x2	*Senna* spp., *Eremophila* spp. +/- *Acacia* spp. open shrubland on rises, low hills, rocky outcrops and scarps of deeply weathered Tertiary and Cretaceous sediments	42,499	42,482	100	NC
4.9.13a	*Senna artemisioides* subsp. *helmsii, S. artemisioides* subsp. *oligophylla, Acacia chisholmii, A bivenosa, Eremophila* spp. in mixed shrublands on Cambrian limestone hills	23,366	23,320	99	NC

Photo 253 *Senna helmsii, S. oligophylla, Eremophila freelingii* and *Acacia stowardii* open shrubland on residual slopes, 4.9.13. Near Glenormiston Homestead, MGD. (VJ Neldner)

Photo 254 *Senna artemisioides* subsp. *oligophylla*, Carryana Station, CHC.
(D Richter)

Photo 255 *Senna* spp. shrubland on residual limestone, 4.9.13b. West of Dajarra, NWH.
(VJ Neldner)

25 Acacia harpophylla (brigalow) sometimes with Casuarina cristata (belah) open forests to woodlands on heavy clay soils

25a Open forests to woodlands dominated by *Acacia harpophylla* (brigalow) sometimes with *Casuarina cristata* (belah) on heavy clay soils. Includes areas co-dominated with *A. cambagei* (gidgee) and/or emergent eucalypts

Pre-clearing area: 10,174,841 ha

Remnant 2017 area: 1,244,374 ha (12.2% of pre-clearing)

Bioregions: BRB (87%), MUL (8%), MGD (2%), DEU (2%), SEQ (0.5%). Formerly covered 24% of the BRB bioregion.

Land zones: 4 (41%), 9 (39%), 3 (12%), 11 (4%), 7 (3%), 12 (1%), 9-10, 5, 8 (minor)

Mean annual rainfall range: Predominantly 500-1000 mm

Typical landforms: Predominantly gently undulating to rolling plains

Typical soils: Grey and Black Vertosols

Structural formation range: Open forest in the east, ranging through to woodland in the west.

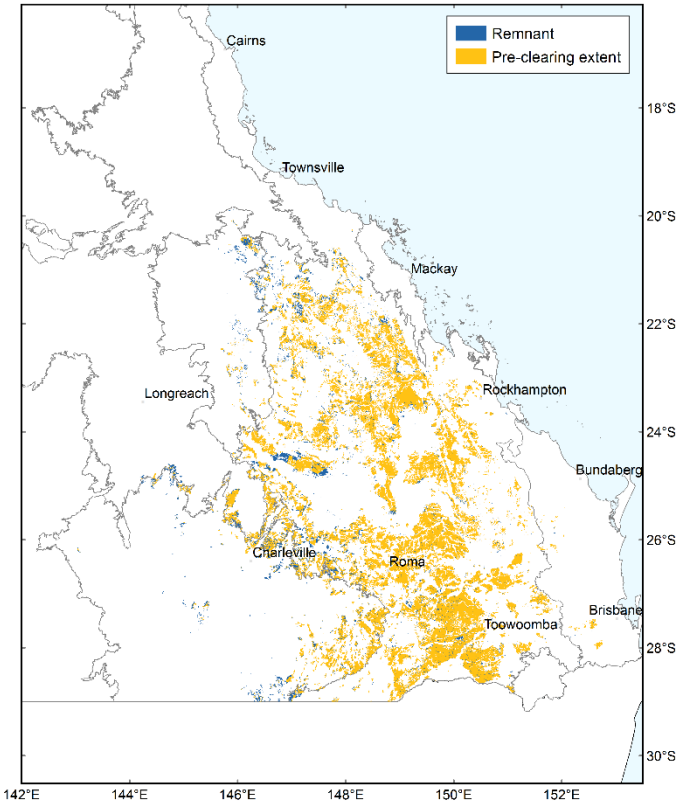


Photo 256 *Acacia harpophylla* and *Casuarina cristata* open forest with *Eremophila mitchelli* and *Geijera parviflora* shrub layer, 11.9.5. Arcadia Valley, BRB.
(VJ Neldner)

Floristic characteristics: *Acacia harpophylla* is generally the dominant tree, with *Casuarina cristata* often co-dominant. *Eucalyptus cambageana* is sometimes present as an emergent tree. *Eremophila mitchellii, Geijera parviflora, Alectryon oleifolius, A. diversifolius, Ehretia membranifolia* and *Carissa ovata* are frequent shrubs. The most frequent graminoids in the sparse ground layer are *Paspalidium caespitosum, P. distans, Sporobolus caroli, S. scabridus,*

Enteropogon acicularis, Ancistrachne uncinulata, Cyperus gracilis, Cymbopogon refractus, Eragrostis lacunaria, Aristida personata, and *Eriochloa pseudoacrotricha. Enchylaena tomentosa, Abutilon oxycarpum, Brunoniella australis, Capparis lasiantha, Nyssanthes erecta, Einadia nutans, Commelina diffusa* and *Evolvulus alsinoides* are frequent forbs.

Table 71 Five most extensive regional ecosystems included in BVG 25a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks	1,922,314	139,413	7	E
11.4.3	*Acacia harpophylla* and/or *Casuarina cristata* shrubby open forest on Cainozoic clay plains	1,547,297	71,979	5	E
11.3.1	*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains	776,257	78,308	10	E
11.4.9	*Acacia harpophylla* shrubby woodland with *Terminalia oblongata* on Cainozoic clay plains	753,684	79,262	11	E
11.4.8	*Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains	724,417	66,943	9	E

The Brigalow (*Acacia harpophylla* dominant and co-dominant) ecological community which is listed as endangered under the *EPBC Act* includes regional ecosystems 6.4.2, 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14, 11.12.21, 12.8.23, 12.9-10.6 and 12.12.26 from this BVG.

Photo 257 *Acacia harpophylla* woodland with a tall shrub layer dominated by *Eremophila mitchellii* and *Geijera parviflora*,11.4.3. Yuleba SF, BRB.
(RE Niehus)

Photo 258 *Acacia harpophylla* open forest, 11.9.5. West of Injune, BRB.
(VJ Neldner)

Photo 259 *Acacia harpophylla* woodland, 11.9.5. Castlevale station, north of Mitchell, BRB.
(WJF McDonald)

26 *Acacia cambagei* (gidgee) / *A. georginae* (Georgina gidgee) / *A. argyrodendron* (blackwood) open forests to tall shrublands

26a Open forests to tall shrublands dominated by *Acacia cambagei* (gidgee) or *A. georginae* (Georgina gidgee) or *A. argyrodendron* (blackwood)

Pre-clearing area: 9,000,268 ha

Remnant 2017 area: 6,930,033 ha (77.0 % of pre-clearing)

Bioregions: MGD (34%), CHC (23%), MUL (18%), BRB (7%), DEU (7%), GUP (5%), NWH (5%), EIU (1%).

Land zones: 9 (41%), 3 (26%), 4 (10%), 6 (10%), 5 (7%), 7 (5%), 8 (1%)

Mean annual rainfall range: 200-800 mm

Typical landforms: Predominantly gently undulating to rolling plains

Typical soils: Grey and Black Vertosols, and Sodosols

Structural formation range: Woodland in the east, ranging through to low woodland and tall shrubland in the west.

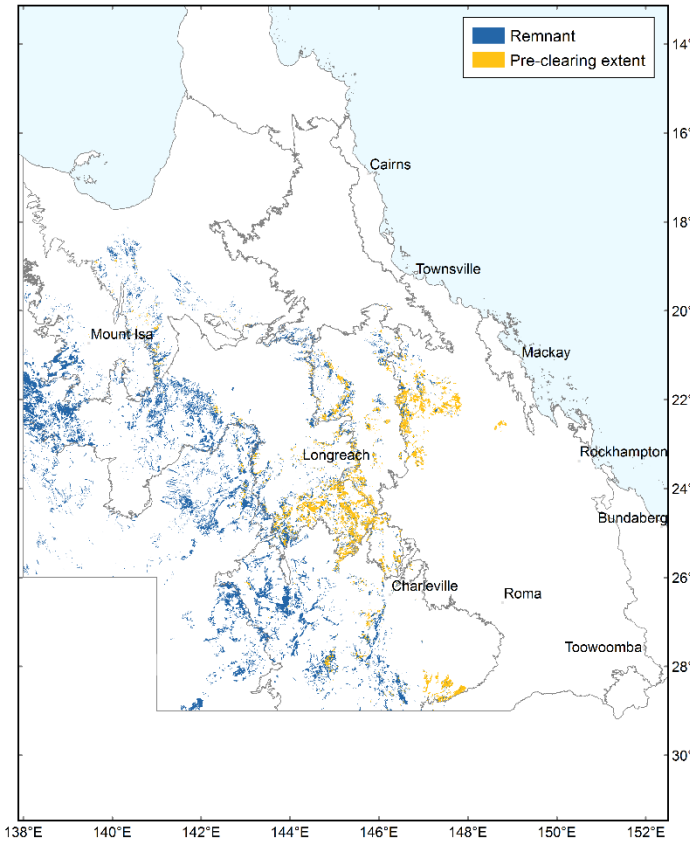


Photo 260 *Acacia cambagei* tall open shrubland, 4.9.16. East of Stonehenge, MGD.
(VJ Neldner)

Floristic characteristics: *Acacia cambagei* is the dominant tree, with *A. georginae* sometimes dominating in the west, and *A. argyrodendron* in the northeast. Scattered emergent *Eucalyptus* trees are sometimes present. A sparse to open shrub layer is often present with *Enchylaena tomentosa, Eremophila* and *Senna* species. Frequent grasses include *Chloris pectinata, Dactyloctenium radulans, Enneapogon, Eragrostis, Paspalidium, Sporobolus* spp., and

Tripogon loliiformis. Frequent forb species include *Abutilon leucopetalum, Boerhavia, Euphorbia, Heliotropium* spp. *Evolvulus alsinoides* and *Salsola australis*.

Table 72 Six most extensive regional ecosystems included in BVG 26a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.6.2	*Acacia georginae* and/or *Acacia cambagei* low open woodland +/- *Eremophila* spp. on interdune areas and clay plains in dune fields	807,900	807,896	100	NC
4.9.11	*Acacia cambagei* low woodland with scattered shrubs such as *Eremophila mitchellii* and *Geijera parviflora* on fresh sediments	621,434	188,023	30	OC
5.9.2x1	*Acacia cambagei* low open woodland with *Eragrostis xerophila, Sporobolus actinocladus* on sediments on undulating plains	580,380	562,999	97	NC
6.3.6	*Acacia cambagei* low woodland on braided channels or alluvial plains	501,018	465,507	93	NC
4.9.16	*Acacia cambagei* ± *Eucalyptus ochrophloia* woodland on alluvium	408,942	352,774	86	NC
6.3.4	*Acacia cambagei* +/- scattered shrub species including *Santalum lanceolatum* and *Eremophila mitchellii* tall open shrubland	402,980	175,032	43	NC

Photo 261 *Acacia cambagei* tall shrubland with *Eremophila mitchellii* understorey on sandplain, 4.9.11. South of Tarcombe Homestead, MGD. (VJ Neldner)

Photo 262 *Acacia cambagei* low woodland on alluvium, 2.3.7b. Near Talawanta Homestead, GUP. (GW Wilson)

Photo 263 *Acacia georginae* tall open shrubland with *Eremophila obovata* low shrubs on sandplain, 5.6.2. West of Glenormiston, CHC. (VJ Neldner)

Photo 264 *Acacia cambagei* and *Eucalyptus ochrophloia* woodland, 6.3.4. NW of Cunnamulla. (VJ Neldner)

27 Mixed species woodlands to open woodlands (*Atalaya hemiglauca* (whitewood), *Lysiphyllum* spp., *Acacia tephrina* (boree), wooded downs

27a Low open woodlands dominated by a variety of species including *Acacia tephrina* (boree), *Atalaya hemiglauca* (whitewood), *Archidendropsis basaltica* (eastern dead finish), *Ventilago viminalis* (supplejack) and *Lysiphyllum* spp.

Pre-clearing area: 3,926,545 ha

Remnant 2017 area: 3,662,962 ha (93.3% of pre-clearing)

Bioregions: MGD (88%), NWH (8%), GUP (2%), BRB (1%), DEU (0.7%), EIU (0.6%), CHC (0.4%), CYP (0.4%)

Land zones: 9 (88%), 5 (8%), 4 (2%), 3 (2%)

Mean annual rainfall range: Predominantly 400-800 mm

Typical landforms: Gently undulating to level plains on Cretaceous sediments and alluvia

Typical soils: Brown Vertosols

Structural formation range: Low open woodland to wooded open tussock grassland

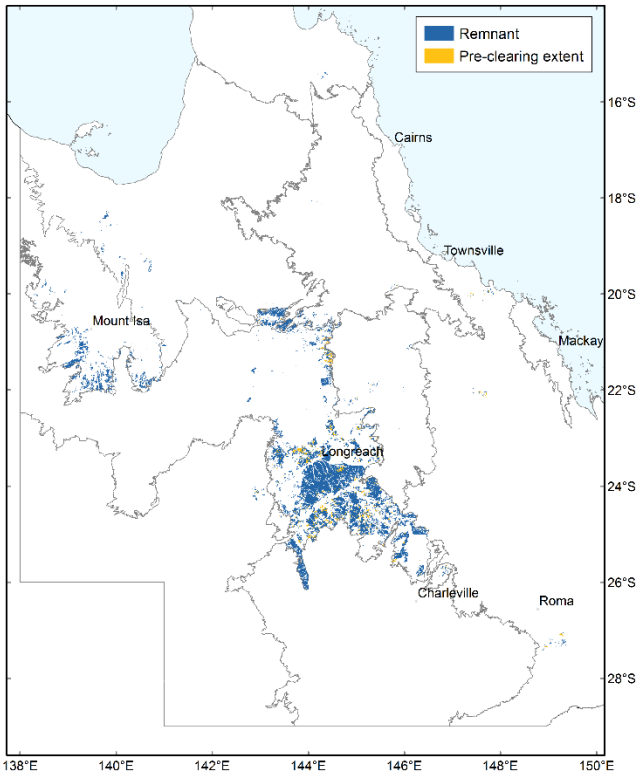


Photo 265 *Acacia tephrina* low open woodland with *Astrebla lappacea* dominated ground layer, 4.9.7a. NW of Yaraka, MGD.

(VJ Neldner)

Floristic characteristics: Low open woodlands dominated by a variety of species including *Acacia tephrina*, *Atalaya hemiglauca*, *Ventilago viminalis Archidendropsis basaltica*, *Terminalia* spp., *Acacia* spp., *Lysiphyllum carronii* or *L. gilvum. Corymbia terminalis* is frequently present as well. Shrubs are very sparse with *Carissa lanceolata, Capparis lasiantha* and *Eremophila mitchellii* the most frequent species. The sparse ground layer is dominate by the grasses *Aristida latifolia, Sporobolus australasicus, S. actinocladus, Brachyachne convergens,*

Enneapogon polyphyllus, Eulalia aurea, Chrysopogon fallax, Iseilema vaginiflorum, Bothriochloa ewartiana, Astrebla lappacea, A. squarrosa, A. pectinata Dactyloctenium radulans, Enneapogon avenaceus and *Heteropogon contortus.* The most frequent forbs are *Rhynchosia minima, Sida fibulifera, S. trichopoda, Salsola australis, Portulaca oleracea, Boerhavia* spp*., Achyranthes aspera, Evolvulus alsinoides, Neptunia gracilis, Phyllanthus maderaspatensis, Sclerolaena bicornis* and *Solanum esuriale.*

Table 73 Five most extensive regional ecosystems included in BVG 27a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.9.8	*Astrebla* spp. grassland wooded with *Atalaya hemiglauca* ± *Alectryon oleifolius* ± *Flindersia maculosa* on Cretaceous sediments	1,231,700	1,203,002	98	NC
4.9.7a	*Astrebla* spp. grassland wooded with *Acacia tephrina* ± *A. cambagei* and *Atalaya hemiglauca* on Cretaceous sediments	1,188,667	1,113,144	94	NC
4.9.7	*Acacia tephrina* low woodland	392,115	312,487	80	NC
1.5.6c	*Atalaya hemiglauca, Corymbia terminalis, Acacia cambagei* and/or *Grevillea striata* low open woodland on red earth plains	292,376	291,911	100	NC
4.9.7x1	*Acacia tephrina* and/or *Acacia cambagei* low open woodland on plains	280,864	245,213	87	NC

Photo 266 *Acacia crombei* low open woodland on sandy rise. *Eulalia aurea* tussock grassland in foreground. 4.9.8. South of Beryl Homestead, MGD. (VJ Neldner)

Photo 267 *Astrebla* spp.tussock grassland wooded with *Atalaya hemiglauca* and *Acacia cambagei*, 4.9.7a. Near Longreach, MGD. (VJ Neldner)

Photo 268 *Archidendropsis basaltica* open woodland, 4.9.18. NNW of Blackall, MGD. (CN Appelman)

27b Low woodlands of a variety of species including Lysiphyllum cunninghamii, Grevillea striata (beefwood), Atalaya hemiglauca (whitewood) occurring on sandplains. (Bylong land system)

Pre-clearing area: 800,308 ha

Remnant 2017 area: 784,077 ha (98.0% of pre-clearing)

Bioregions: GUP (88%), NWH (11%), MGD (0.8%)

Land zones: 5 (91%), 9 (7%), 3 (2%)

Mean annual rainfall range: 600-800 mm

Typical landforms: Flat to gently undulating sand plains

Typical soils: Red and Brown Kandosols

Structural formation range: Low woodland to low open woodland

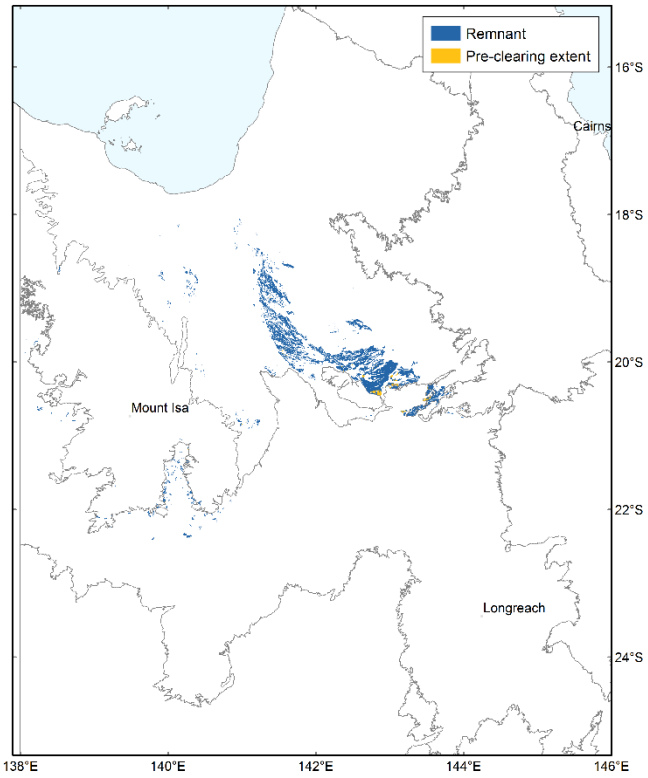


Photo 269 Mixed low woodland dominated by *Lysiphyllum* sp. with *Atalaya hemiglauca, Archidendropsis basaltica* and *Terminalia aridicola* on Tertiary sand sheets. ("Bylong forest"), 2.5.1a. NW of Richmond, GUP. (CN Appelman)

Floristic characteristics: The very sparse low tree canopy is frequently a mixture of *Lysiphyllum cunninghamii, Atalaya hemiglauca, Grevillea striata, Ventilago viminalis* and *Corymbia terminalis. Erythrophleum chlorostachys, Eucalyptus* spp*., Melaleuca* spp*.* and *Terminalia* spp*.* may also be present in the canopy. The very sparse shrub layer frequently has *Carissa lanceolata, Capparis lasiantha, Acacia cambagei, A. holosericea, Flueggea virosa* subsp*. melanthesoides, Senna artemisioides* subsp*. oligophylla, Gossypium australe, Melaleuca nervosa* and *M. viridiflora* frequently occurring. The sparse ground layer is

dominated by the grasses *Chrysopogon fallax, Heteropogon contortus, Eulalia aurea, Enneapogon polyphyllus, Aristida ingrata, A. latifolia, A. contorta, A. inaequiglumis, A. hygrometrica, Sporobolus australasicus, Bothriochloa ewartiana, Perotis rara* and *Dactyloctenium radulans.* Frequent forbs include *Cleome viscosa, Indigofera linifolia, Achyranthes aspera, Evolvulus alsinoides, Indigofera linnaei, Salsola australis, Waltheria indica* and *Boerhavia* spp.

Table 74 Five most extensive regional ecosystems included in BVG 27b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.5.1a	*Lysiphyllum cunninghamii, Atalaya hemiglauca, Eucalyptus microneura* and *Grevillea striata* in mixed open woodlands on Tertiary sand sheets	341,237	329,818	97	NC
2.5.1b	*Lysiphyllum cunninghamii, Terminalia* spp., *Erythrophleum chlorostachys* and *Melaleuca nervosa* in mixed low woodlands on Quaternary residual sand sheets.	279,435	278,913	100	NC
2.5.1c	*Lysiphyllum cunninghamii* and/or *Lysiphyllum carronii +/- Atalaya hemiglauca, Grevillea striata* low woodland on Quaternary sand sheets	51,837	47,963	93	NC
4.9.14x41	*Atalaya hemiglauca, Ventilago viminalis, Grevillea striata, Acacia cambagei, Vachellia sutherlandii* in mixed low open woodlands on Tertiary clay plains	47,107	47,097	100	NC
4.5.6x1	*Atalaya hemiglauca, Corymbia terminalis, Acacia cambagei, C. aparrerinja, Grevillea striata* in mixed low open woodlands on Tertiary sand sheets	44,942	44,785	100	NC

Photo 270 *Lysiphyllum cunninghamii* and *Melaleuca nervosa* woodland with occasional *Terminalia platyptera* on late Tertiary sand deposit (Bylong forest), 2.5.1b. Claraville Station, GUP. (HA Dillewaard)

Photo 271 *Atalaya hemiglauca, Ventilago viminalis* and *Grevillea striata* low open woodland on red earth plains, 1.5.6c. East of Duchess, NWH. (VJ Neldner)

27c Low open woodlands dominated by a variety of species including *Grevillea striata* (beefwood), *Acacia* spp., *Terminalia* spp. or *Cochlospermum* spp.

Pre-clearing area: 511,988 ha

Remnant 2017 area: 495,265 ha (96.7% of pre-clearing)

Bioregions: NWH (52%), EIU (26%), DEU (11%), GUP (8%), BRB (2%), MGD (0.5%)

Land zones: 9 (37%), 12 (33%), 3 (13%), 10 (8%), 11 (6%), 5 (3%),

Mean annual rainfall range: 400-1000 mm

Typical landforms: Rocky limestone hills, relict sand plains, alluvial plains

Typical soils: Calcarosols and Rudosols

Structural formation range: Low open woodland to tall open shrubland

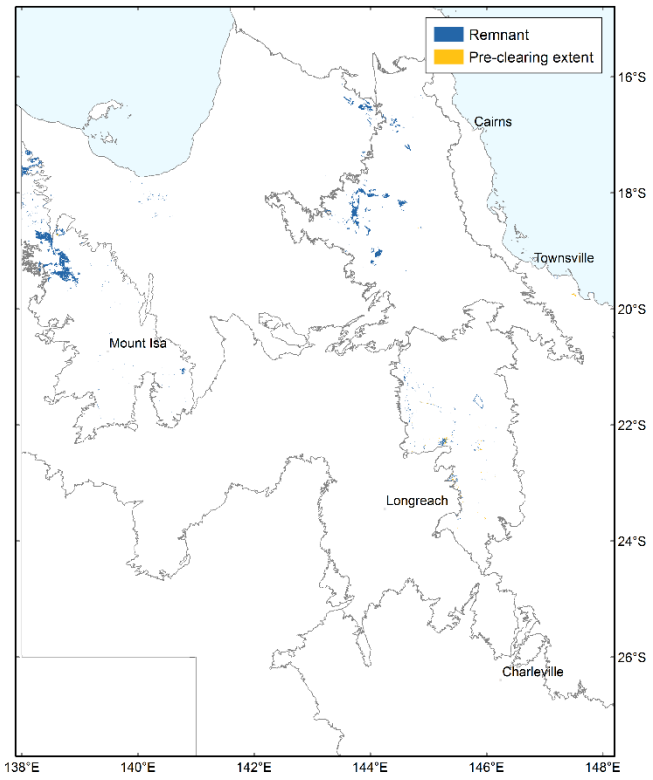


Photo 272 *Terminalia oblongata* low woodland on cracking clay soil on an undulating plain, 2.9.3a. Near Wrotham Park Homestead, GUP. (GW Wilson)

Floristic characteristics: The very sparse canopy is a mixture of these frequently occurring low trees *Terminalia aridicola, Eremophila mitchellii, Atalaya hemiglauca, Lysiphyllum carronii, L. cunninghamii, Corymbia terminalis, Grevillea striata, Cochlospermum gillivraei, C. gregorii, Erythrophleum chlorostachys, Flindersia maculosa* and *Acacia excelsa.* The very sparse shrub

layer frequently includes *Carissa lanceolata, Petalostigma banksii, P. pubescens, Psydrax oleifolia, Denhamia cunninghamii, Santalum lanceolatum, Capparis lasiantha, Clerodendrum floribundum, Gardenia vilhelmii* and *Grevillea mimosoides.* Graminoids such as *Fimbristylis dichotoma, Schizachyrium fragile, Sporobolus actinocladus, S. australasicus, Enneapogon polyphyllus, Tripogon loliiformis, Dactyloctenium radulans, Chrysopogon fallax, Oxychloris scariosa, Bothriochloa ewartiana* and *Aristida latifolia* frequently dominate the ground layer. Frequent forbs include *Evolvulus alsinoides, Sida fibulifera, Portulaca oleracea, P. australis, Trianthema triquetra, Salsola australis, Abutilon otocarpum, Alternanthera micrantha* and *Solanum esuriale.*

Table 75 Five most extensive regional ecosystems included in BVG 27c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
1.9.4b	Mixed shrubby woodland on rocky limestone hills	168,597	167,957	100	NC
9.12.36a	*Cochlospermum gregorii* or *C. gillivraei* ± *Terminalia* spp. ± *Erythrophleum chlorostachys* low open woodland on rocky outcrops	136,628	136,285	100	NC
1.10.3	*Corymbia aspera* low open woodland on rocky soils	41,072	41,071	100	OC
1.11.8	Scrub trees on rock outcrops	29,955	29,881	100	OC
2.9.3a	*Terminalia platyphylla, Lysiphyllum cunninghamii, Corymbia confertiflora* and *Terminalia platyptera* deciduous low open woodland on undulating mudstone/siltstone plains	22,137	22,085	100	NC

Photo 273 *Cochlospermum gregorii, Corymbia peltata* and *Pleiogynium timorense* open woodland on rocky granite hills, 9.12.36a. Near Kidston Mine Dam, EIU. (CPF Kahler)

Photo 274 *Corymbia terminalis* and *Lysiphyllum cunninghamii* low open woodland with a mixed shrub layer and a ground layer of *Enneapogon* spp., 1.11.6. Gregory Downs Station, NWH. (DT Kelman)

28 Open forests to open woodlands in coastal locations. Dominant species such as *Casuarina* spp., *Corymbia* spp., *Allocasuarina* spp. (she-oak), *Acacia* spp., *Lophostemon suaveolens* (swamp box), *Asteromyrtus* spp., *Neofabricia myrtifolia*

28a Complex of open shrublands to closed shrublands, grasslands, low woodlands and open forests, on strand and foredunes. Includes pure stands of *Casuarina equisetifolia* (coastal she-oak)

Pre-clearing area: 120,650 ha

Remnant 2017 area: 116,727 ha (96.7% of pre-clearing)

Bioregions: GUP (71%), SEQ (23%), BRB (3%), CYP (2%), WET (1%), CQC (1%)

Land zones: 2 (95%), 1 (5%)

Mean annual rainfall range: >1000 mm

Typical landforms: Foredunes and beach ridges

Typical soils: Arenic Rudosols

Structural formation range:
(1) Bare area, open hummock grassland to open herbland;
(2) & (3) Woodland to low woodland

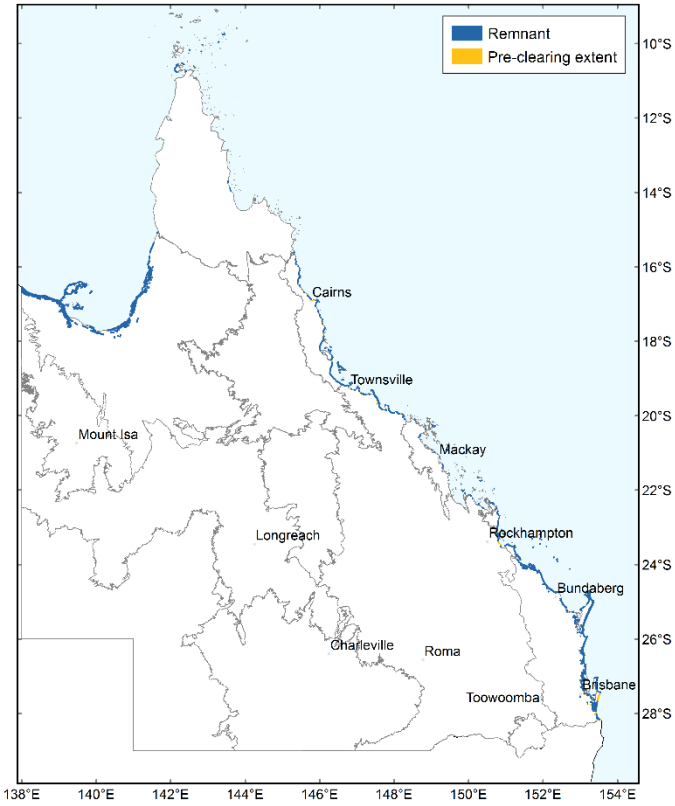


Photo 275 *Corymbia bella* low woodland on Quaternary coastal dunes, 2.2.7. Near Inkerman Station, GUP.
(VJ Neldner)

Floristic characteristics: (1) The sparse herbland frequently contains *Spinifex sericeus, Thuarea involuta, Sporobolus virginicus, Lepturus repens, Euphorbia tannensis* subsp. *tannensis, Tribulus cistoides, Canavalia rosea, Salsola australis* and *Sesuvium portulacastrum.*

(2) *Casuarina equisetifolia* subsp*. incana* generally dominates the sparse canopy*. C. glauca* may dominate in some areas of SEQ bioregion. Shrubs are generally very sparse and may include *Argusia argentea, Wollastonia biflora, Scaevola taccada, Abutilon albescens* and *Ficus opposita.* The ground layer is sparse to mid-dense and is dominated by grasses such as *Thuarea involuta, Eragrostis interrupta, Lepturus repens, Spinifex sericeus, Cenchrus echinatus* and *Sporobolus virginicus,* and forbs such as *Euphorbia tannensis* subsp*. tannensis, Achyranthes aspera, Tribulus cistoides, Ipomoea pes-caprae* subsp*. brasiliensis* and *Carpobrotus glaucescens.*

(3) Corymbia bella or *Grevillea striata* or *Hakea arborescens* or *Melaleuca viridiflora* may occur in a sparse low woodland in GUP bioregion. *Acacia holosericea, M. leucadendra* and *Petalostigma pubescens* may also be present in the canopy*. Flueggea virosa, F. leucopyrus, Diospyros geminata, Grewia retusifolia* and *Alphitonia excelsa* are sometimes present in the very sparse shrub layer. Frequently occurring graminoids in the sparse ground layer are *Heteropogon contortus, Chrysopogon elongatus, C. fallax, Perotis rara, Aristida holathera, Fimbristylis dichotoma, Schizachyrium fragile, Alloteropsis semialata, Ectrosia schultzii, Eragrostis cumingii* and *Eriachne mucronata.* Frequent forbs are *Waltheria indica, Breynia oblongifolia, Evolvulus alsinoides, Afrohybanthus enneaspermus, Crotalaria brevis, Desmodium filiforme, Galactia tenuiflora, Jasminum molle, Phyllanthus virgatus, Nelsonia campestris, Sida acuta* and *S. cordifolia.*

Table 76 Five most extensive regional ecosystems included in BVG 28a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.2.7	*Corymbia bella +/- C. polycarpa, C. confertiflora, Grevillea striata, Pandanus sp.* woodland on coastal dunes	66,604	66,440	100	NC
12.2.14	Foredune complex	21,904	21,572	98	NC
2.2.4	*Chrysopogon elongatus, Eriachne* spp.*, Perotis rara* and *Aristida holathera* in mixed tussock grasslands on coastal dunes	9,875	9,875	100	NC
2.2.1	Beaches and foredunes	6,743	6,721	100	OC
12.1.1	*Casuarina glauca* woodland on margins of marine clay plains	5,809	3,638	63	NC

Photo 276 *Spinifex sericeus* and *Ipomoea pes-capre* closed tussock grassland, 8.2.1. Shoalwater Bay Training Area, Five Rocks Beach, CQC.
(VJ Neldner)

Photo 277 *Casuarina equisetifolia* subsp. *incana* woodland, 12.2.14b. Heron Island, Capricornia Cays NP, SEQ.
(DA Halford)

28b Open forests to woodlands dominated by *Acacia crassicarpa* (brown salwood) or other *Acacia* spp. with *Syzygium* spp., *Corymbia* spp. and/or *Parinari nonda* (parinari)

Pre-clearing area: 94,773 ha

Remnant 2017 area: 86,817 ha (91.6% of pre-clearing)

Bioregions: CYP (68%), BRB (22%), CQC (8%), WET (2%)

Land zones: 2 (96%), 3 (4%)

Mean annual rainfall range: More than 1600 mm

Typical landforms: Beach ridges and coastal dunes

Typical soils: Bleached Orthic Tenosols

Structural formation range: Woodland to open forest

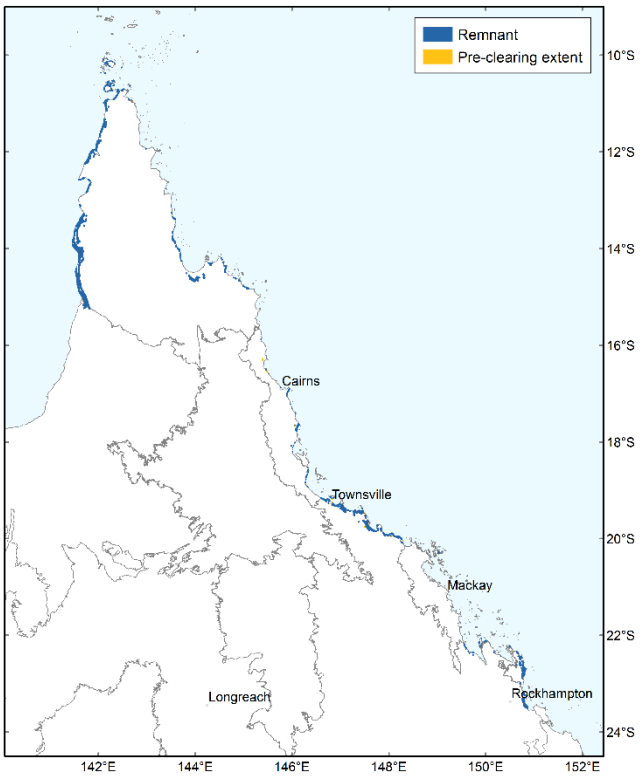


Photo 278 *Acacia torulosa* and *Syzygium suborbiculare* low open forest in swale between old dunes, 3.2.10b. Near Ninian Bay, Cape Melville NP, CYP.

(VJ Neldner)

Floristic characteristics: *Acacia crassicarpa* is a consistent and usually dominant component of the sparse and discontinuous canopy (6-20m tall). *Syzygium suborbiculare*, *Parinari nonda, Cupaniopsis anacardioides, Pleiogynium timorense, Terminalia muelleri, Allocasuarina littoralis, Acacia platycarpa* and *A. torulosa* are frequent trees in the canopy. *Corymbia tessellaris* may be present as scattered emergents or form part of the canopy. A sparse to mid-dense shrub layer may include heath species such as *Lithomyrtus obtusa, Leptospermum*

neglectum, Ricinocarpos pinifolius, Leucopogon leptospermoides or *Acacia oraria, Planchonia careya, Alphitonia excelsa, Exocarpos latifolius*, *Senna surattensis* and *Dodonaea viscosa*. The sparse ground layer may include *Caustis recurvata, Trachystylis stradbrokensis, Schoenus ornithopodioides, S. calostachyus, Eriachne insularis, E. pallescens, Bulbostylis barbata, Setaria surgens, Perotis rara, Aristida holathera*, *Cymbopogon refractus* and *Panicum* spp. Frequent forbs include *Cassytha filiformis, Hibiscus meraukensis*, *Indigofera hirsuta*, *Phyllanthus virgatus*, *Xenostegia tridentata*, *Achyranthes aspera*, *Anisomeles* sp., *Blumea saxatilis* and *Bonamia media.*

Table 77 Five most extensive regional ecosystems included in BVG 28b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.2.5a	*Acacia crassicarpa* +/- *Syzygium suborbiculare* +/- *Parinari nonda* woodland on beach ridges	55,473	55,257	100	NC
11.2.5	*Corymbia-Melaleuca* woodland complex of beach ridges and swales	20,370	13,246	65	NC
8.2.3a	*Allocasuarina littoralis* and/or *Leptospermum polygalifolium* and/or *Leptospermum neglectum* shrubland on parabolic and whaleback dunes	5,502	5,487	100	OC
3.2.13b	Mixed woodland on beach ridges on the east coast	4,858	4,857	100	OC
3.3.34	*Corypha utan* woodland on alluvial plains	4,014	4,014	100	OC

Photo 279 *Corypha utan* open woodland on old beach dune, 3.3.34. Lakefield NP, CYP.
(VJ Neldner)

Photo 280 *Acacia crassicarpa* dominated woodland on beach dunes, 3.2.5a. Ninian Bay, CYP.
(MR Newton)

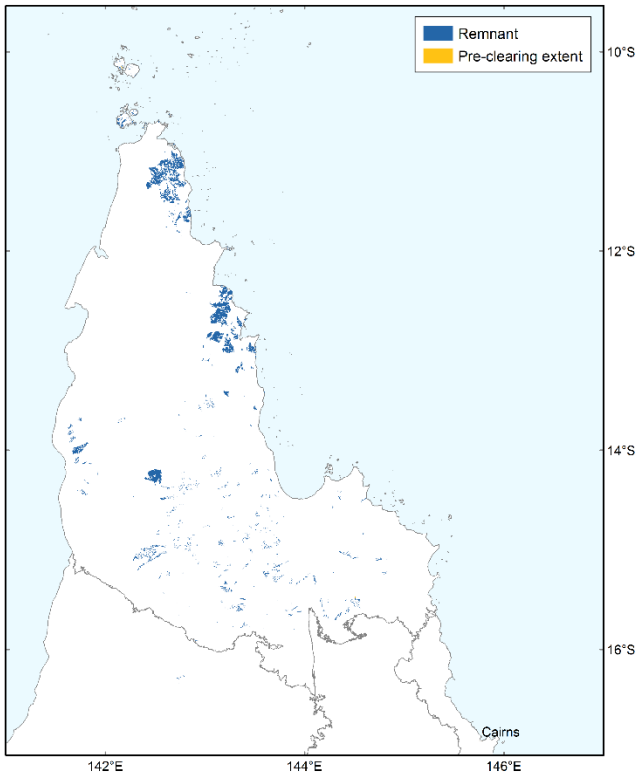
28c Low open forests dominated by *Asteromyrtus brassii*, *Neofabricia myrtifolia*, *Allocasuarina littoralis* (woolly oak), *Melaleuca viridiflora* (coarse-leaved paperbark) on sandplains and plateaus; or *Acacia brassii* low open forests or *Melaleuca viridiflora* low woodlands on ranges; or *Thryptomene oligandra* ± *Neofabricia mjoebergii* ± *Melaleuca viridiflora* woodlands on drainage depressions

Pre-clearing area: 371,713 ha

Remnant 2017 area: 371,097 ha (99.8% of pre-clearing)

Bioregions: CYP (99.5%), GUP (0.5%)

Land zones: 5 (81%), 12 (18%), 3 (1%)



Mean annual rainfall range:
(1) 1000-1600 mm;
(2 & 3) >1600 mm in northern CYP

Typical landforms: (1) Foot slopes of drainage depressions; (2) sand sheets and sandplains; (3) granitic and metamorphic ranges

Typical soils: (1) Yellow Kandosols (2) Humic Aquic or Semiaquic Podosols, with some occurrences on Orthic Tenosols and Yellow Kandosols, (3) Orthic Tenosols and Bleached-leptic Tenosols

Structural formation range:
Woodland to low woodland

Photo 281 *Thryptomene oligandra* and *Banksia dentata* woodland, 3.3.33. North Kennedy River crossing, CYP.
(MR Newton)

Floristic characteristics (Drainage depressions): *Thryptomene oligandra* dominates the sparse to mid-dense canopy (5-14 m tall) often with *Melaleuca viridiflora*, *Neofabricia mjoebergii* and *Grevillea pteridifolia Corymbia clarksoniana* and *Eucalyptus tetrodonta* are sometimes emergents (8-15 m tall). *Acacia torulosa* and *Syzygium eucalyptoides* subsp. *eucalyptoides* may occur as emergents but more frequently are in the canopy. A sparse shrub layer frequently includes *Leucopogon ruscifolius, Alyxia spicata* and *Pandanus* sp. The diverse ground layer is sparse, with *Schizachyrium* spp., *Thaumastochloa* spp., *Eriocaulon* spp. and *Ectrosia* spp. often dominating.

Floristic characteristics (northern sandplains): *Asteromyrtus brassii, Neofabricia myrtifolia* and *Allocasuarina littoralis* usually dominate the mid-dense canopy (6-10 m tall). *Welchiodendron longivalve*, *Acacia crassicarpa*, *Allocasuarina littoralis* and *Lophostemon suaveolens* trees are also frequently conspicuous in the canopy. A sparse subcanopy layer (2-6 m tall) is frequently dominated by *Dodonaea polyandra* and *A. littoralis*, or *Leucopogon yorkensis*. A sparse to mid-dense shrub layer (0.5-1.5 m tall) dominated by *Alyxia spicata, D. polyandra, Choriceras tricorne* or *Exocarpos latifolius* species is usually present. The ground layer is very sparse with *Schoenus sparteus, Cleistochloa* spp., *Lomandra* spp., *Alloteropsis semialata*, *Eulalia mackinlayi* and *Gahnia aspera* being the most frequent species.

Floristic characteristics (sandplains and ranges): *Melaleuca viridiflora*, together with *Neofabricia myrtifolia*, *Allocasuarina littoralis*, *Asteromyrtus brassii* and sometimes *Acacia brassii* dominate the sparse canopy (4-12 m tall). *Corymbia nesophila* and less frequently *Eucalyptus tetrodonta* are present as emergent trees (9-16 m tall). The same species dominate the sparse low tree layer (2-5 m tall). A sparse shrub layer (0.5-3 m tall) is present, with *Acacia calyculata, Persoonia falcata*, *Hibbertia banksii* forma *banksii, Melaleuca viridiflora, Asteromyrtus lysicephala* and *Choriceras tricorne* occurring at the highest densities. The ground layer is sparse, and frequently dominated by *Xanthorrhoea johnsonii*. Commonly encountered graminoids include *Eriachne* spp., *Schoenus sparteus* and *Cleistochloa* spp.

Table 78 Six most extensive regional ecosystems included in BVG 28c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.5.39x1	*Thryptomene oligandra* and *Melaleuca viridiflora* +/- *Neofabricia mjoebergii* woodland on seepage areas off Tertiary plains	198,077	197,791	100	NC
3.5.42	*Asteromyrtus brassii* and/or *Neofabricia myrtifolia* low open forest to woodland on sand plains	104,144	104,046	100	NC
3.12.47	Mixed heath species low woodland or wetter dwarf shrublands on slopes of rocky igneous hills.	35,225	35,222	100	NC
3.12.45	*Melaleuca viridiflora* +/- *Eucalyptus* spp. low woodland to low open woodland on steep hills and footslopes.	14,101	14,070	100	NC
3.12.46	*Melaleuca stenostachya* shrubland on exposed igneous headlands and hills	6,594	6,583	100	NC
3.12.28	*Leptospermum purpurascens* tall shrubland on igneous hills	5,753	5,753	100	OC

Photo 282 *Melaleuca viridiflora* low woodland on plain, 3.12.45. Near Lockhardt River, CYP.
(MR Newton)

Photo 283 *Neofabricia myrtifolia* and *Asteromyrtus brassii* low open forest on margins of incised creek, 3.3.54b. Fruitbat Falls, CYP.
(MR Newton)

Photo 284 *Asteromyrtus brassii* and *Neofabricia myrtifolia* low woodland on sandplain, 3.3.54b. NE of Heathlands, CYP.
(MR Newton)

Photo 285 *Leptospermum purpurascens* tall shrubland, 3.12.28. Near Lockhart River CYP.
(VJ Neldner)

28d Sand blows to closed herblands of *Lepturus repens* (stalky grass) and herbs on sand cays and shingle cays

Pre-clearing area: 37,131 ha

Remnant 2017 area: 36,138 ha (97.3% of pre-clearing)

Bioregions: CYP (82%), SEQ (17%), CQC (1%)

Land zones: 2 (100%)

Mean annual rainfall range: >1600 mm

Typical landforms: (1) sand blows; (2) foredunes and sand/ coral islands

Typical soils: Arenic Rudosols, occasionally developing Aeric Podosols

Structural formation range:
(1) bare;
(2) sparse herbland

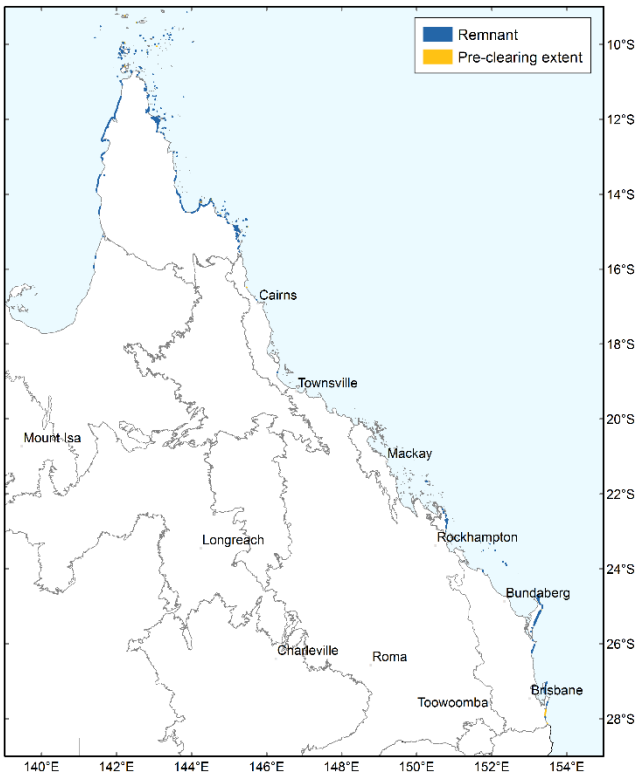


Photo 286 Sparse herbland, mostly devoid of vegetation, 3.2.26. 6 km SW of Messum Hill, CYP.
(VJ Neldner)

Floristic characteristics: (1) Bare sand, devoid of vascular plants, except in sheltered clumps.

(2) A variety of forbs and graminoids form a very sparse ground layer (20-50 cm tall). *Perotis rara* and *Bulbostylis barbata* frequently have the highest cover, with *Sarga plumosum* (plume sorghum) dominating less frequently. *Lepturus repens, Sporobolus virginicus,* and *Thuarea involuta* dominate the cays. *Spinifex longifolius or S. sericeus, Eragrostis interrupta* and *Cyperus pedunculosus* dominate frontal dunes. Frequent forbs include *Achyranthes aspera, Tribulus cistoides, Canavalia rosea, Sesuvium portulacastrum, Ipomoea brassii, I. pes-caprae*

subsp*. brasiliensis, Abutilon albescens, Euphorbia atoto* and *Boerhavia* spp*.* Very sparse emergent shrubs (0.5-1.5 m tall) and low trees (3-6 m tall) may occasionally occur.

Table 79 Five most extensive regional ecosystems included in BVG 28d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.2.24	Open herbland of mixed graminoids and forbs on exposed foredunes	15,547	15,524	100	NC
3.2.26	Sparse herbland/shrubland and bare sand areas predominantly on sand blows	13,948	13,796	99	OC
12.2.16	Sand blows largely devoid of vegetation	6,151	5,390	88	OC
8.2.10	Sand blows with bare sand and areas of sparse herbland or shrubland	480	480	100	OC
3.2.24b	Mixed closed tussock grassland to forbland on exposed foredunes	398	368	93	OC

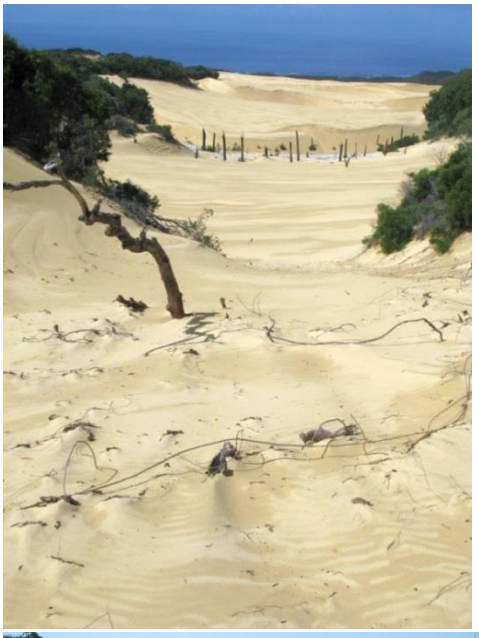


Photo 287 Sand blow, 12.2.16. Near Lake Wabby, Fraser Island, SEQ.
(VJ Neldner)

Photo 288 *Lithomyrtus obtusa* dwarf open shrubland wih emergent *Alphitonia excelsa* on sand blow, 8.2.10. Shoalwater Bay Training Area, CQC.
(RM Lovatt)

Photo 289 *Sarga plumosum* tussock grassland with emergent *Grevillea parallela,* 3.2.25. South of Vrilya Point, CYP.
(VJ Neldner)

28e Low open forests to woodlands dominated by *Lophostemon suaveolens* (swamp box) (or *L. confertus* (brush box)) or *Syncarpia glomulifera* (turpentine) frequently with *Allocasuarina* spp. on rocky hill slopes

Pre-clearing area: 113,577 ha

Remnant 2017 area: 101,001 ha (88.9% of pre-clearing)

Bioregions: CQC (47%), WET (33%), SEQ (14%), BRB (4%), CYP (1%)

Land zones: 12 (74%), 3 (13%), 9-10 (8%), 11 (5%), 10 (1%), 8, 5 (minor)

Mean annual rainfall range: >1200 mm

Typical landforms: Steep ridges, slopes and crests on rolling hills to mountains

Typical soils: Orthic Tenosols.

Structural formation range: Open forest to low open forest, to tall shrubland

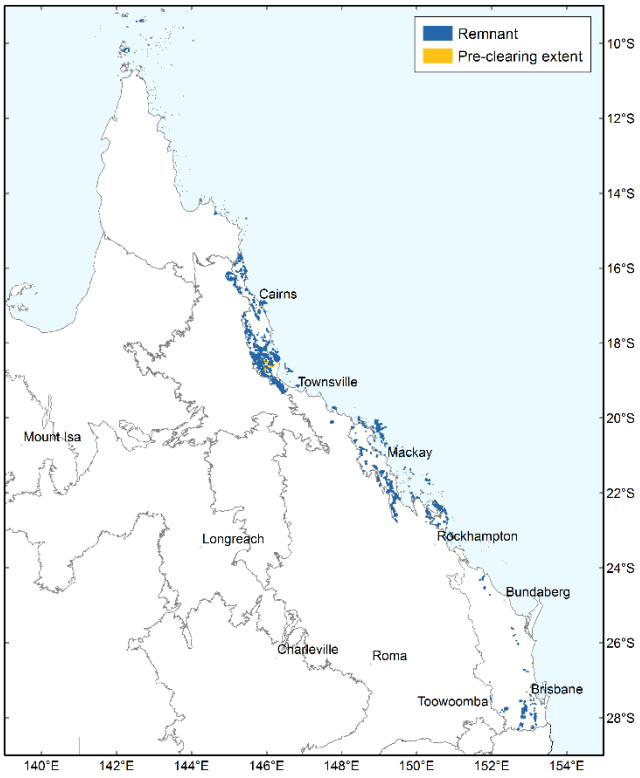


Photo 290 *Lophostemon confertus* and *Acacia leiocalyx* open scrub, 8.11.10. SE of Considine Bay, North Keppel Island NP, CQC. (JE Kemp)

Floristic characteristics: *Lophostemon confertus* and/or *L. suaveolens* often dominate the mid-dense canopy. *Eucalyptus portuensis, Syncarpia glomulifera, Allocasuarina torulosa* and/or *A. littoralis* dominate in some areas. Other associated trees include *Corymbia trachyphloia, Acacia spirorbis* subsp. *solandri, A. falcata* and *E. drepanophylla*. Shrub layers, when present, are very sparse to sparse and may be dominated by *Xanthorrhoea latifolia* subsp*. latifolia, Acacia fimbriata, Bursaria tenuifolia, Acacia falcata, Breynia oblongifolia, Cassinia quinquefaria* and *Melichrus adpressus*. The ground layer ranges from very sparse to

mid-dense and may be dominated by species such as *Xanthorrhoea latifolia* subsp. *latifolia*, *Gahnia aspera, Imperata cylindrica, Lomandra longifolia, Sorghum nitidum* forma *aristatum*, *Themeda triandra, Mnesithea rottboellioides* and *Eremochloa bimaculata*. Frequent forbs include *Dianella caerulea, Eustrephus latifolius, Phyllanthus virgatus, Cassytha filiformis* and *Clematicissus opaca.*

Table 80 Five most extensive regional ecosystems included in BVG 28e

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
8.12.5a	*Lophostemon confertus* and/or *Eucalyptus portuensis* (or *E. exserta*) low open forest on steep upper slopes and spurs on Mesozoic to Proterozoic igneous rocks	29,933	29,143	97	NC
7.12.26a	*Syncarpia glomulifera, Allocasuarina torulosa* and/or *A. littoralis* open forest and woodland, on steep uplands and highlands on granite and rhyolite	14,753	14,744	100	NC
12.9-10.17a	*Lophostemon confertus* dominated open forest on sedimentary rocks	9,515	4,414	46	NC
8.12.14b	*Acacia spirorbis* low open forest on hill slopes of islands and headlands on Mesozoic to Proterozoic igneous rocks, and Tertiary acid to intermediate volcanics	9,169	9,123	100	NC
7.3.46	*Lophostemon suaveolens* open forest to woodland, on alluvial plains	7,422	1,729	23	E

Photo 291 *Eucalyptus portuensis* and *Corymbia trachyphloia* open forest, 8.12.5a. Sydney Heads, Britton Range, NE of Homevale Homestead, CQC.
(JE Kemp)

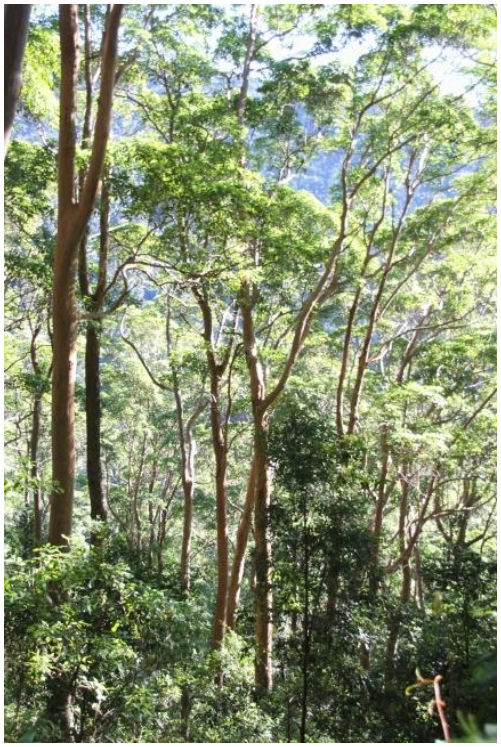


Photo 292 *Lophostemon confertus* dominated open forest, 12.9-10.17a. Near Binna Burra, SEQ.
(VJ Neldner)

29 Heathlands and associated scrubs and shrublands on coastal dunefields and inland montane locations

29a Open heaths and dwarf open heaths on coastal dunefields, sandplains and headlands

Pre-clearing area: 584,518 ha

Remnant 2017 area: 546,536 ha (93.5% of pre-clearing)

Bioregions: CYP (72%), SEQ (28%), WET, BRB (minor)

Land zones: 5 (40%), 2 (35%), 3 (20%), 7 (2%), 10 (2%), 12 (0.3%), 11 (0.2%)

Mean annual rainfall range: >1600 mm throughout

Typical landforms: Undulating sand plains and dunes; rocky headlands; low open woodlands

Typical soils: Yellow Kandosols and Aeric Podosols

Structural formation range: Open to closed heath to dwarf open heath

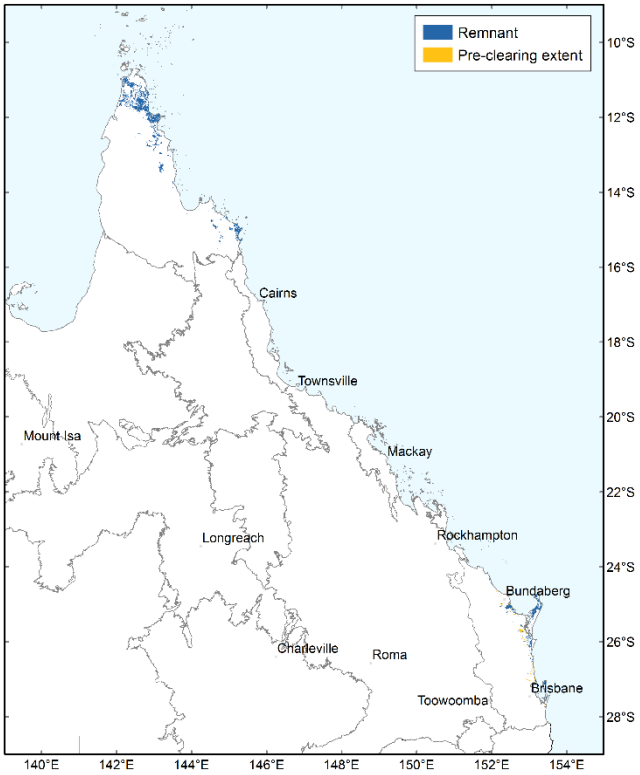


Photo 293 Open heath of *Banksia aemula, Allocasuarina littoralis, Xanthorrhoea johnsonii, Leptospermum semibaccatum, Phebalium woombye, Dillwynia retorta* and *Caustis recurvata*, 12.2.13. Noosa Headland, Noosa NP, SEQ.
(VJ Neldner)

Floristic characteristics: In the north, the sparse to mid-dense shrub layer is dominated by *Neofabricia myrtifolia, Asteromyrtus lysicephala, Jacksonia thesioides, Hibbertia banksii, Allocasuarina littoralis, Grevillea pteridifolia, Neoroepera banksii, Baeckea frutescens, Choriceras tricorne, Boronia alulata, Melaleuca viridiflora, Acacia calyculata* and *Leucopogon ruscifolius*, in varying levels of dominance. *Schoenus sparteus, S. calostachyus, Caustis recurvata, Themeda triandra, Cassytha filiformis, C. pubescens, Lomandra banksii* and *Gahnia sieberiana* are frequent in the ground layer.

In the south, *Banksia aemula* forms low open woodlands with *Leptospermum trinervium, Allocasuarina littoralis, Acacia flavescens* and *A. penninervis. Eucalyptus planchoniana, E. latisinensis, E. racemosa* subsp*. racemosa* or *Corymbia gummifera* may be present in the canopy as emergents. *Acacia suaveolens, Leptospermum polygalifolium, Xanthorrhoea johnsonii, Aotus ericoides, Gompholobium virgatum, Leucopogon leptospermoides, Persoonia virgata, Melaleuca nodosa* and *Ricinocarpos pinifolius* are frequent in the sparse shrub layer*. Caustis recurvata, Entolasia stricta, Gahnia sieberiana, Lepidosperma laterale, Trachystylis stradbrokensis, Triodia marginata, Entolasia whiteana* and *Eriachne pallescens* are frequent graminoids.

Table 81 Five most extensive regional ecosystems included in BVG 29a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.5.19	*Asteromyrtus lysicephala and Neofabricia myrtifolia open heath to shrubland on sand*	189,947	188,468	99	NC
3.3.53	*Neofabricia myrtifolia +/- Melaleuca viridiflora* low woodland on streams and alluvial plains	90,715	90,700	100	NC
12.2.9	*Banksia aemula* low open woodland on dunes and sand plains. Usually deeply leached soils	65,605	63,843	97	NC
3.2.21	*Neofabricia myrtifolia +/- Jacksonia thesioides* open to closed heath on dunefields	59,229	58,781	99	NC
3.2.18	*Thryptomene oligandra* open heath +/- *Asteromyrtus lysicephala* on flat sand plains	52,656	52,611	100	NC

Photo 294 *Banksia aemula, Eucalyptus latisinensis* low woodland, 12.5.10. Bingera NP, SEQ. (TS Ryan)

Photo 295 Wind sheared open heath, 3.2.22. On Shelburne dunefields, CYP. (VJ Neldner)

Photo 296 *Neofabricia myrtifolia* with *Jacksonia thesioides* closed heath on dunefield, 3.2.21. Near Cape Bedford, CYP.
(VJ Neldner)

29b Open shrublands to open heaths on elevated rocky substrates

Pre-clearing area: 161,369 ha

Remnant 2017 area: 146,315 ha (90.7% of pre-clearing)

Bioregions: BRB (52%), EIU (11%), WET (11%), CYP (6%), GUP (5%), NWH (5%), DEU (4%), SEQ (3%), NET (3%), CQC (0.6%),

Land zones: 7 (46%), 12 (32%), 10 (14%), 5 (4%), 8 (4%), 11 (0.3%),

Mean annual rainfall range: >600 mm

Typical landforms: Predominantly bare areas; natural scalds, remnant surfaces, and ranges. Not coastal headlands.

Typical soils: Shallow Rudosols

Structural formation range: Bare rock; frequently with patches of heath, shrubland and woodland

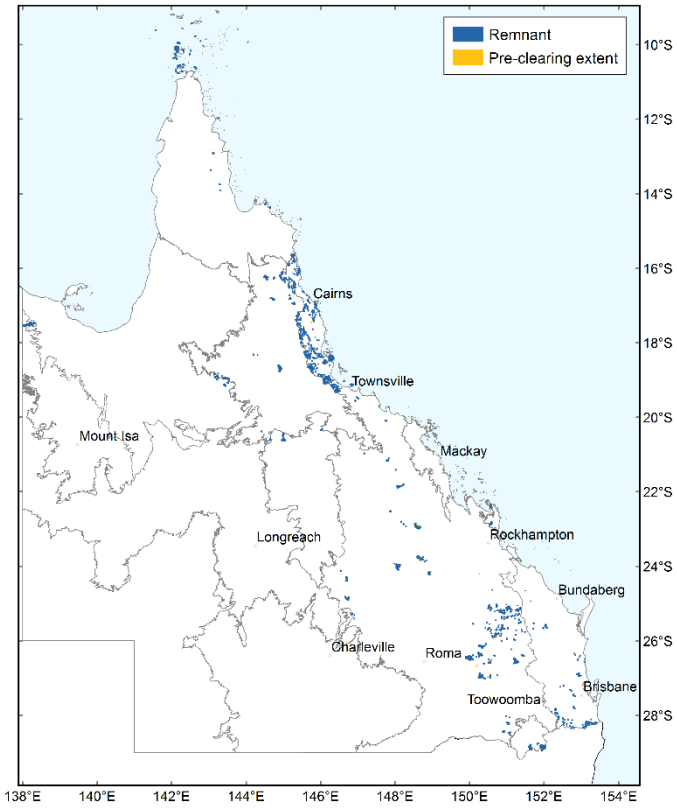


Photo 297 *Acacia* spp., *Corymbia* spp. and *Eucalyptus* spp. on rock pavements, 2.10.2x1. Gilberton Range south of Forsayth, GUP. (CN Appelman)

Floristic characteristics: Highly variable vegetation and structure depending on the bioregion, substrate and the depth of soil in the local situation. Usually includes a number of species in the following families: Casuarinaceae (*Allocasuarina* spp.), Cyperaceae (e.g. *Fimbristylis* and *Scleria*), Ericaceae (especially *Leucopogon* and *Monotoca*), Fabaceae (especially *Acacia* spp.), Laxmanniaceae (*Lomandra* spp.), Myrtaceae (especially stunted and mallee habit *Corymbia* and *Eucalyptus, Asteromyrtus* spp., *Calytrix* spp., *Leptospermum* spp., *Melaleuca* spp. and *Micromyrtus* spp.), Poaceae (both perennial tussocks and annual species), Proteaceae (especially *Banksia¸ Grevillea, Hakea* and *Persoonia* spp.), Rutaceae (especially *Boronia* and *Zieria* spp.) and Xanthorrhoeaceae (*Xanthorrhoea* spp.).

Table 82 Five most extensive regional ecosystems included in BVG 29b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
11.7.5	Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks	73,770	62,884	85	NC
1.10.9	*Acacia* spp. and/or *Calytrix exstipulata* open shrubland on rock pavement	8,614	8,614	100	NC
2.10.2x1	Rock pavements and outcrops with patches of *Acacia* spp., *Corymbia* spp. and *Eucalyptus* spp. in dissected Mesozoic sandstone ranges.	7,164	7,164	100	OC
7.12.64a	*Xanthorrhoea* spp., *Allocasuarina littoralis, Banksia plagiocarpa, Leptospermum polygalifolium, Rhodomyrtus trineura* subsp. *trineura* heathland, of granite uplands and highlands of Hinchinbrook Island and near Bishop Peak	6,642	6,643	100	NC
3.12.34	Igneous rock pavements associated with mountains and some offshore islands.	6,617	6,604	100	NC

Photo 298 Extensive granite pavements with clumped grasses and woody vegetation, 9.12.43a. Northern crest of granite massive, Bonny Glen Station, EIU.
(GW Wilson)

Photo 299 *Allocasuarina thalassoscopica, Banksia integrifolia, Hakea gibbosa, Leptospermum flavescens,* and *Lomandra confertifolia* montane heath. 12.8.19. Near summit of Mt Coolum, SEQ.
(VJ Neldner)

Photo 300 Granite boulders, 3.12.34. Melville Range, CYP.
(VJ Neldner)

Photo 301 *Borya sepententrionalis* forbland, 7.12.37i. Lambs Head, WET.
(VJ Neldner)

Photo 302 *Leptospernum* spp. and *Gahnia* sp. heathland (foreground), 13.12.6. South Bald Rock, Girraween NP, NET.
(MT Mathieson)

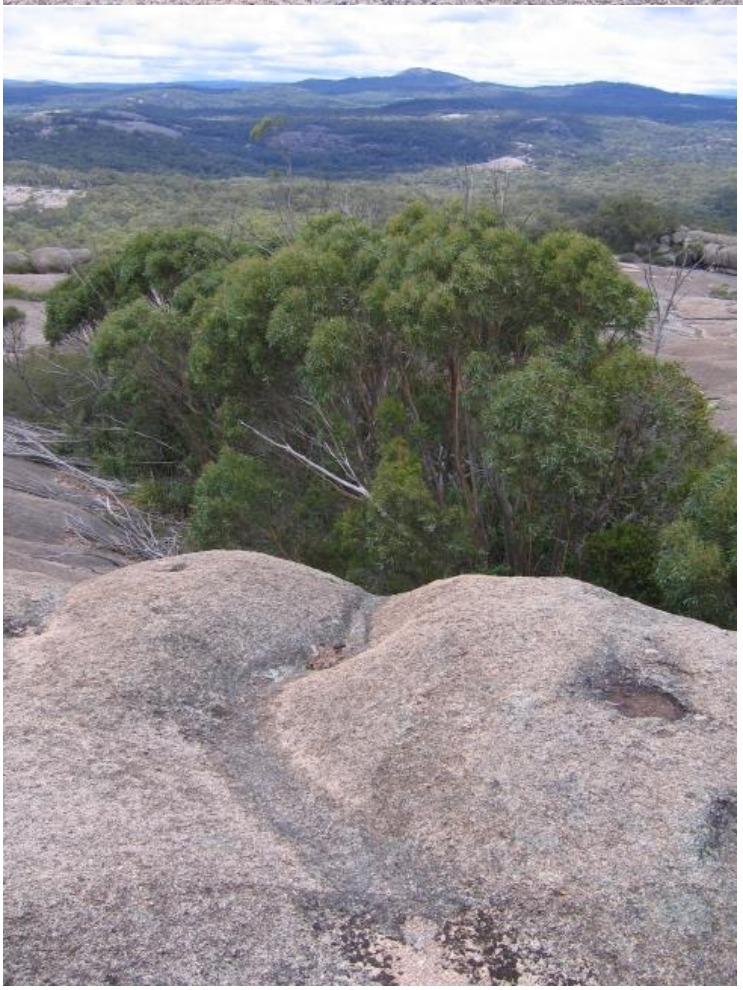


Photo 303 *Eucalyptus codonocarpa* shrubland, 13.12.6. Mallee Ridge, Girraween NP, NET.
(MT Mathieson)

30 *Astrebla* spp. (Mitchell grass), *Dichanthium* spp. (bluegrass) tussock grasslands

30a Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Eulalia aurea* (silky browntop) on alluvia

Pre-clearing area: 4,205,889 ha

Remnant 2017 area: 3,743,477 ha (89.0% of pre-clearing)

Bioregions: MGD (50%), GUP (27%), BRB (11%), MUL (11%), NWH (0.5%), DEU (0.4%), CHC (0.1%), EIU (0.1%),

Land zones: 3 (95%), 4 (5%)

Mean annual rainfall range: 300 – 1200 mm

Typical landforms: Flat alluvial plains

Typical soils: Grey to Brown Vertosols

Structural formation range: Tussock grassland in the east, to sparse tussock grassland in the west.

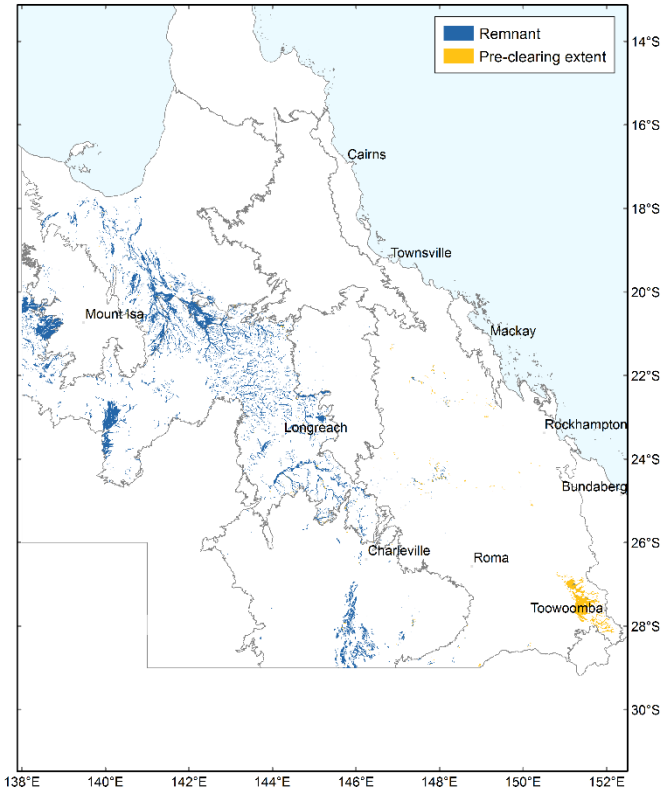


Photo 304 *Iseilema* sp., *Astrebla* spp. closed tussock grassland on clay alluvial plain, 2.3.3. Near Normanton, GUP.

(ID Fox)

Floristic characteristics: The dominant grasses are *Astrebla pectinata, A. lappacea, A. elymoides* and *Iseilema* spp*. Eulalia aurea, Astrebla squarrosa, Aristida latifolia,* and *Panicum*

decompositum are other frequent grasses. Frequently present forbs include *Neptunia dimorphantha, N. gracilis, Ipomoea lonchophylla, Sida fibulifera, S. filiformis, S. trichopoda, Solanum esuriale, Salsola australis, Portulaca oleracea, Aeschynomene indica, Cleome viscosa, Cullen cinereum* and *Rhynchosia minima.*

Table 83 Five most extensive regional ecosystems included in BVG 30a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.3.14	*Astrebla lappacea, Astrebla* spp. ± *Eulalia aurea* grassland on alluvium	830,268	811,783	98	NC
2.3.3	*Astrebla* spp. grassland on plains of cracking clays	781,445	776,784	99	NC
11.3.21	*Dichanthium sericeum* and/or *Astrebla* spp. grassland on alluvial plains. Cracking clay soils	448,016	51,553	12	E
4.3.15	*Astrebla squarrosa +/- Dichanthium spp. +/- Eulalia aurea* grassland on alluvium	388,446	385,780	99	NC
6.3.15	*Astrebla lappacea, Astrebla pectinata* ± *A. elymoides* grassland on alluvium	327,666	321,892	98	NC

Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland ecological community which is listed as critically endangered under the *EPBC Act* includes regional ecosystems 11.3.21 and 11.3.24 from this BVG.

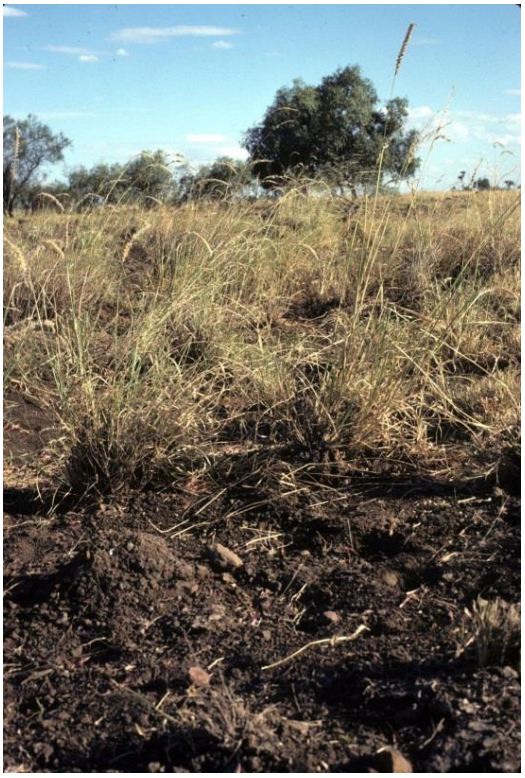


Photo 305 *Astrebla squarrosa* tussock grassland, 4.3.14. In drainage line near Eversham Homestead, MGD.
(VJ Neldner)

Photo 306 *Dichanthium sericeum* tussock grassland on alluvial plain, 11.3.21. Near Springsure, BRB.
(DW Butler)

30b Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Iseilema* spp. on undulating downs or clay plains

Pre-clearing area: 17,912,697 ha

Remnant 2017 area: 17,141,349 ha (95.7% of pre-clearing)

Bioregions: MGD (57%), CHC (19%), GUP (14%), BRB (6%), EIU (2%), NWH (0.8%); DEU (0.7%). Dominates the MGD by covering 40% of the bioregion.

Land zones: 9 (69%), 4 (25%), 8 (5%), 3 (0.2%), 5, 11 (minor)

Mean annual rainfall range: <200 - >1000 mm

Typical landforms: Gently undulating to rolling plains

Typical soils: Grey to Brown Vertosols

Structural formation range: Tussock grasslands in the east, to sparse tussock grasslands in the west.

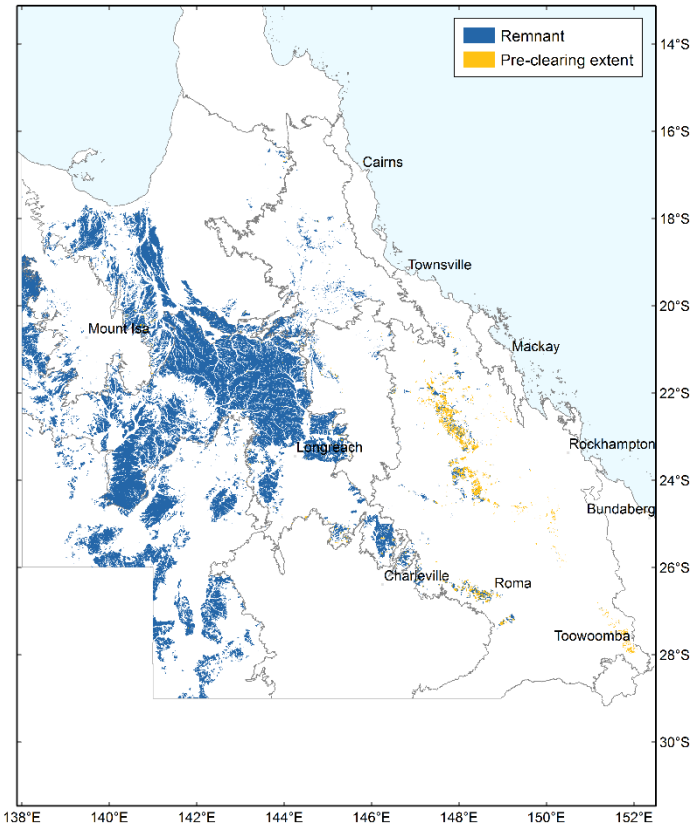


Photo 307 *Astrebla pectinata* tussock grassland, 4.4.1. Barkly Downs Station, west of Mt Isa, MGD.
(DT Kelman)

Floristic characteristics: The dominant grasses are *Astrebla pectinata* (particularly in the western areas), and *A. lappacea, A. squarrosa,* and *A. elymoides* in other areas. *Dichanthium sericeum* dominates the basalt derived soils of the Brigalow Belt. *Aristida latifolia, Iseilema* spp., and *Panicum decompositum* are other frequent grasses. Frequently present forbs include *Atriplex lindleyi, A. muelleri, A. spongiosa, Boerhavia dominii, Crotalaria dissitiflora, C. medicaginea, Ipomoea lonchophylla, Polymeria longifolia, Sclerolaena calcarata, S. bicornis, S. lanicuspis, Sida fibulifera, S. filiformis, S. trichopoda, Solanum esuriale, Salsola australis* and *Rhynchosia minima.*

Table 84 Five most extensive regional ecosystems included in BVG 30b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.9.1a	*Aristida* spp. *Enneapogon* spp. open grassland wooded with scattered *Atalaya hemiglauca, Ventilago viminalis*	3,175,888	3,167,544	100	NC
5.9.3	Astrebla spp. +/- short grasses +/- forbs open herbland on Cretaceous sediments	2,034,867	2,031,124	100	NC
4.9.1c	*Astrebla* spp., *Iseilema* spp. +/- *Panicum decompositum, Dichanthium spp*. tussock grassland on level downs derived from Cretaceous mudstones in the north	1,524,865	1,517,974	100	NC
4.9.20	*Astrebla lappacea* +/- *Aristida latifolia* +/- *Panicum decompositum* grassland on Cretaceous sediments with ashy soils	1,362,754	1,349,143	99	NC
2.4.2a	*Astrebla* spp., *Iseilema* spp. +/- *Aristida latifolia, Sarga* spp. tussock grassland on Tertiary clay plains	1,010,198	1,003,291	99	OC

The Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin ecological community which is listed as endangered under the *EPBC Act* includes regional ecosystems 11.4.4, 11.4.11, 11.8.11, 11.9.3, 11.9.12 and 11.11.17 from this BVG.

Photo 308 *Dichanthium sericeum* tussock grassland on basalt plain. 11.8.11. Albinia Downs, BRB.
(DW Butler)

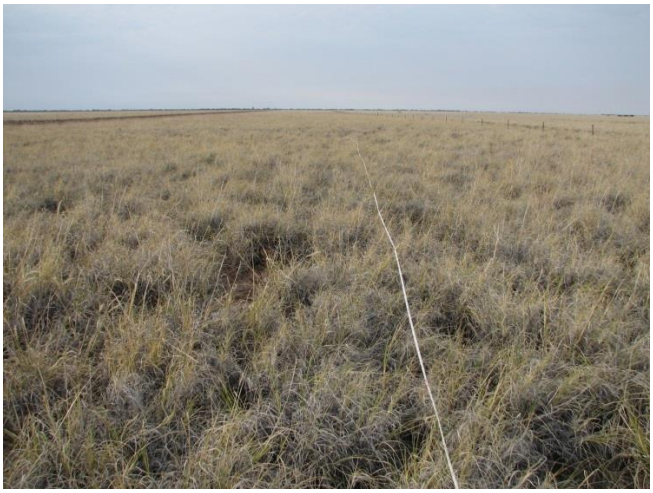


Photo 309 *Astrebla* spp. tussock grassland on old alluvial clay plain, 2.4.2a. NW of McKinlay, GUP.
(HA Dillewaard)

Photo 310 *Astrebla lappacea* and *A. elymoides* tussock grassland, 4.9.1. SW of Hughenden, MGD.
(VJ Neldner)

31 Mixed open forblands to open tussock grasslands in inland locations

31a Open forblands to open tussock grasslands which may be composed of *Atriplex* spp. (saltbush), *Sclerolaena* spp. (burr), *Asteraceae* spp. and/or short grasses on alluvial plains

Pre-clearing area: 5,404,946 ha

Remnant 2017 area: 5,340,287 ha (98.8% of pre-clearing)

Bioregions: CHC (57%), MGD (20%), MUL (16%), GUP (4%), BRB (1%), NWH (0.7%), DEU (0.6%)

Land zones: 3 (97%), 5 (3%)

Mean annual rainfall range: 150 mm -600 mm

Typical landforms: Flat alluvial plains and braided channel systems

Typical soils: Vertosols

Structural formation range: Open herbland to sparse herbland

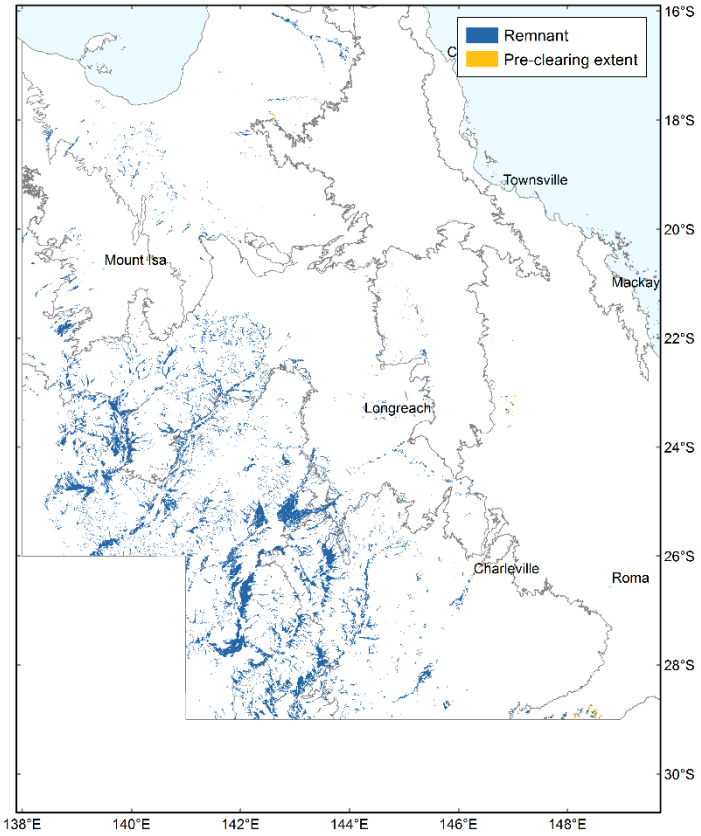


Photo 311 *Eragrostis setifolia* grassland on alluvial plain, 5.3.19. Near Bedourie, CHC.
(C Pennay)

Floristic characteristics: The dominant floristics can vary depending on seasonal conditions and local variations in habitat. During summer rainfall or flooding, grasses tend to dominate, while forbs dominate after winter events. Frequent graminoids are *Dactyloctenium radulans, Sporobolus actinocladus, S. australasicus, S. caroli, S. mitchellii, Aristida latifolia, Astrebla pectinata, A. elymoides, A. squarrosa, Tripogon loliiformis, Enneapogon polyphyllus, Fimbristylis dichotoma, Oxychloris scariosa, Brachyachne convergens, Chloris pectinata* and *Iseilema* spp. Frequent forbs include *Atriplex lindleyi, A. spongiosa, Alternanthera nodiflora, Trianthema triquetra, Salsola australis, Euphorbia drummondii, Sclerolaena glabra, S. calcarata, S. tricuspis, Sida fibulifera, S. trichopoda, S. filiformis, Maireana villosa, Streptoglossa adscendens, Evolvulus alsinoides, Neptunia dimorphantha* and *Solanum esuriale.*

Table 85 Five most extensive regional ecosystems included in BVG 31a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.3.21a	Variable sparse to open herbland and bare scalded areas on infrequently flooded alluvia of major rivers their distributaries, drainage channels and creeks	1,111,730	1,111,268	100	NC
5.3.19	Variable sparse to open herbland on frequently flooded alluvial plains	992,276	992,149	100	NC
5.3.18b	Variable sparse to open herbland on braided channel systems on alluvial plains	935,789	935,484	100	NC
6.3.13	*Atriplex* spp., *Sclerolaena* spp., species of *Asteraceae* and/or short grasses open herbland on alluvial plains	889,951	871,420	98	NC
4.3.20	*Atriplex* spp. and *Sclerolaena* spp. +/- *Astrebla* spp. +/- short grasses +/- forbs, open herbland on braided or flat alluvial plains	827,677	817,040	99	NC

Photo 312 Braided floodplain which is a mosiac, 5.3.18a and 5.3.18b. Cooper Creek, SW of Windorah, CHC.
(BA Wilson)

Photo 313 Forbland on alluvial plain, 5.3.18b. Eyre Creek, CHC.
(C Pennay)

31b Short grass / forb herblands to sparse tussock grasslands on stony downs

Pre-clearing area: 2,135,329 ha

Remnant 2017 area: 2,126,289 ha (99.6% of pre-clearing)

Bioregions: CHC (94%), DEU (5%), MGD (1%), NWH (0.6%), GUP (minor)

Land zones: 9 (86%), 7 (12%), 5 (2%)

Mean annual rainfall range: Mostly < 400 mm, although up to 600 mm

Typical landforms: Gently undulating plains with silcrete cover

Typical soils: Red Sodosols

Structural formation range: Sparse herblands to sparse tussock grasslands

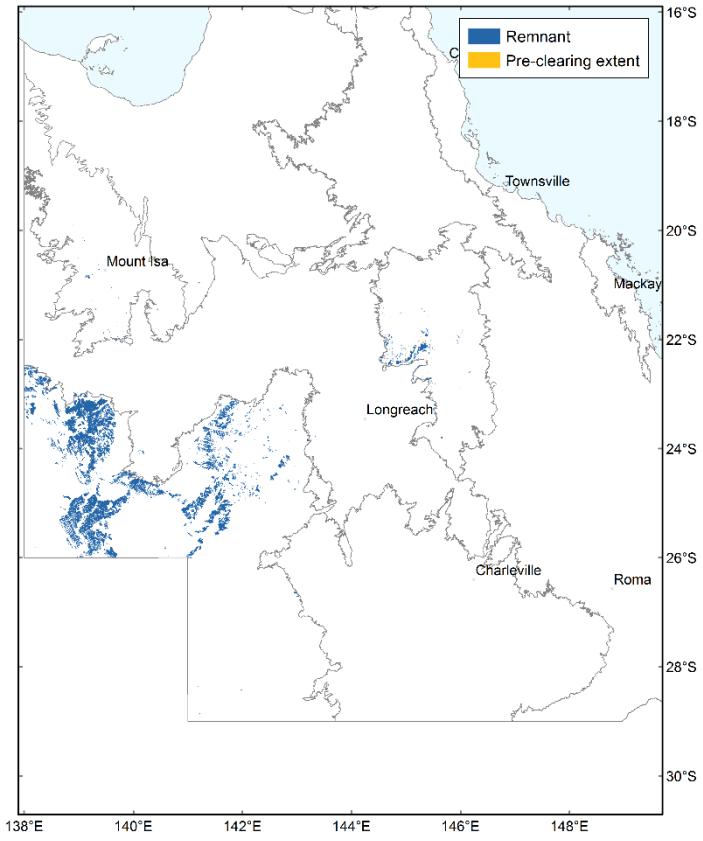


Photo 314 Fluctuating climax of *Atriplex* spp., *Sclerolaena* sp. ± short grasses open herbland on mantled pediments, 5.9.5x1. NE of Bedourie, CHC.

(D Richter)

Floristic characteristics: The dominant floristics can vary depending on seasonal conditions and local variations in habitat. Frequently these stony plains appear virtually devoid of vegetation. During summer rainfall, grasses tend to dominate, while forbs dominate after winter events. *Aristida contorta* is often the dominate grass, with A. *latifolia, A. ingrata, A. inaequiglumis, Oxychloris scariosa, Enneapogon avenaceus, Sporobolus actinocladus* and *S. australasicus* often codominant. Other frequent graminoids are *Dactyloctenium radulans, Tripogon loliiformis, Fimbristylis dichotoma, Brachyachne convergens, Chloris pectinata* and *Triodia pungens.* Frequent forbs include *Alternanthera nodiflora, Trianthema triquetra, Salsola australis, Euphorbia drummondii, Sclerolaena glabra, S. calcarata, S. lanicuspis, S. tricuspis, Sida fibulifera, Evolvulus alsinoides, Neptunia dimorphantha* and *Dysphania rhadinostachya.*

Table 86 Five most extensive regional ecosystems included in BVG 31b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.9.5x1	*Atriplex* spp. and *Sclerolaena* spp. +/- short grasses open herbland on mantled pediments with dense silcrete cover	459,417	459,196	100	NC
5.9.4	*Aristida contorta* sparse herbland on fresh Cretaceous sediments with dense gravel cover	455,862	455,492	100	NC
5.9.4x1	*Aristida contorta* sparse to open-herbland on Cainozoic colluvial and residual deposits	395,616	395,389	100	NC
5.7.10x1	*Aristida contorta +/- Enneapogon avenaceus* sparse herbland on rises, low hills, rocky outcrops and scarps of deeply weathered Tertiary and Cretaceous sediments.	236,013	235,925	100	NC
5.9.5	*Atriplex* spp. and *Sclerolaena* spp. and *Salsola australis* open herbland on Cretaceous sediments	217,821	217,254	100	NC

Photo 315 *Aristida contorta* very sparse tussock grassland on plain, 5.9.4. East of the Diamantina Development Road, NE of Betoota, CHC.
(D Richter)

Photo 316 *Sclerolaena* spp., *Salsola australis* open herbland on Cretaceous sediments, 5.9.5. SE of Betoota, CHC.
(D Richter)

Photo 317 Stony downs with *Acacia cambagei* in drainage line, 5.9.4. SE of Boulia, CHC.
(VJ Neldner)

32 Closed tussock grasslands in coastal locations

32a Closed tussock grasslands dominated by *Eriachne* spp., *Fimbristylis* spp., *Aristida* spp. or *Panicum* spp.; or *Themeda arguens*, *Dichanthium sericeum* (Queensland bluegrass) or *Imperata cylindrica* (blady grass) on marine and alluvial plains

Pre-clearing area: 1,319,108 ha

Remnant 2017 area: 1,264,061 ha (95.8% of pre-clearing)

Bioregions: GUP (64%), CYP (30%), BRB (3%), EIU (1%), WET (1%), CQC (0.8%), NWH (0.2%)

Land zones: 3 (99.9%), 12, 2 (minor)

Mean annual rainfall range: 800 mm - >1600 mm

Typical landforms: Coastal marine and alluvial plains; minor areas of coastal dunes

Typical soils: Aquic or Grey Vertosols, Oxyaquic Hydrosols

Structural formation range: Closed tussock grassland to tussock grassland

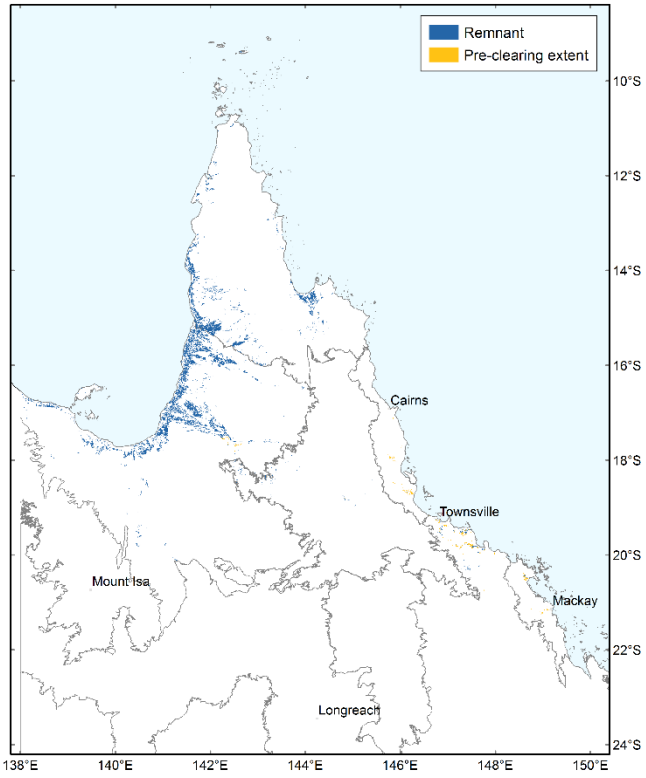


Photo 318 *Eriachne burkittii, Cyperus* sp., and *Ophiuros exaltatus* tussock grassland on semi-saline alluvial plain, 2.3.1a. Inkerman Station, GUP.
(CN Appelman)

Photo 319 *Eriachne* spp., *Fimbristylis* spp. and *Aristida* spp. tussock grassland, 3.3.56. North of Laura, CYP.
(VJ Neldner)

Floristic characteristics: These grasslands may be dominated by *Eriachne*, *Fimbristylis, Aristida*, *Panicum, Scleria* and *Cyperus* species which are frequently sterile and difficult to identify to species level. *Themeda arguens*, *Paspalum scrobiculatum, Brachyachne convergens, Chrysopogon* spp., *Dichanthium* spp. and sometimes *Oryza australiens*is are frequently codominant. *Imperata cylindrica* or *Sporobolus virginicus* may dominate in some areas. Frequent forbs include *Crotalaria montana, Ipomoea coptica, Aeschynomene indica, Chamaecrista mimosoides, Melochia corchorifolia, Evolvulus alsinoides* and *Neptunia gracilis.*

Table 87 Five most extensive regional ecosystems included in BVG 32a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.3.1a	*Eriachne burkittii, Oryza australiensis, Xerochloa imberbis, Ophiuros exaltatus, Eulalia aurea* in mixed tussock grasslands on coastal alluvial plains, commonly adjacent to the tidal zone.	327,924	327,735	100	NC
2.3.44b	*Eriachne* spp*., Chrysopogon fallax, Dichanthium spp., Eulalia aurea* tussock grassland on active Quaternary alluvial plains (outer zones of river deltas)	260,376	253,915	98	OC
3.3.56	*Eriachne* spp. ± *Aristida* spp. closed tussock grassland alluvial plains	153,743	153,628	100	NC
3.3.61	*Fimbristylis* spp. sedgeland on alluvial plains	133,556	133,527	100	OC
2.3.44a	*Eriachne spp., Oryza australiensis, Themeda arguens +/- Eulalia aurea* tussock grassland on active Quaternary alluvial plains (inner zones of river deltas)	107,699	107,187	100	NC

Photo 320 *Dichanthium* spp*., Oryza australiensis* and *Eriachne glauca* tussock grassland on alluvial clay plain, 2.3.9x2b. Van Rook Station, NE of Normanton, GUP.
(CN Appelman)

Photo 321 *Eriachne* sp., *Fimbristylis* sp. and *Dichanthium* sp. tussock grassland, 3.3.61a. Lakefield NP, north of the Morehead River, CYP.
(VJ Neldner)

32b Closed tussock grasslands and associated open woodlands on undulating clay plains, upland areas and headlands. Dominant species include *Heteropogon triticeus* (giant speargrass) or *Themeda arguens* or *Sarga plumosum* or *Imperata cylindrica* (blady grass) or *Mnesithea rottboellioides* (cane grass) / *Arundinella setosa*. With areas of open woodland dominated by tree species such as *Corymbia papuana* (ghost gum) / *Terminalia* spp. / *Vachellia ditricha* / *Piliostigma malabaricum*

Pre-clearing area: 87,866 ha

Remnant 2017 area: 85,995 ha (97.9% of pre-clearing)

Bioregions: CYP (84%), EIU (7%), CQC (6%), WET (1%), BRB (1%), SEQ (1%)

Land zones: 9 (59%), (23%), 12 (13%), 8 (3%), 5 (1%), 11 (1%)

Mean annual rainfall range: 600 mm - >1200 mm

Typical landforms: Gently rolling plains; sand or clay plains; ranges, continental islands and headlands

Typical soils: Brown or Yellow Dermosols or Rudosols

Structural formation range: Closed tussock grassland to tussock grassland; open shrubland to open woodland.

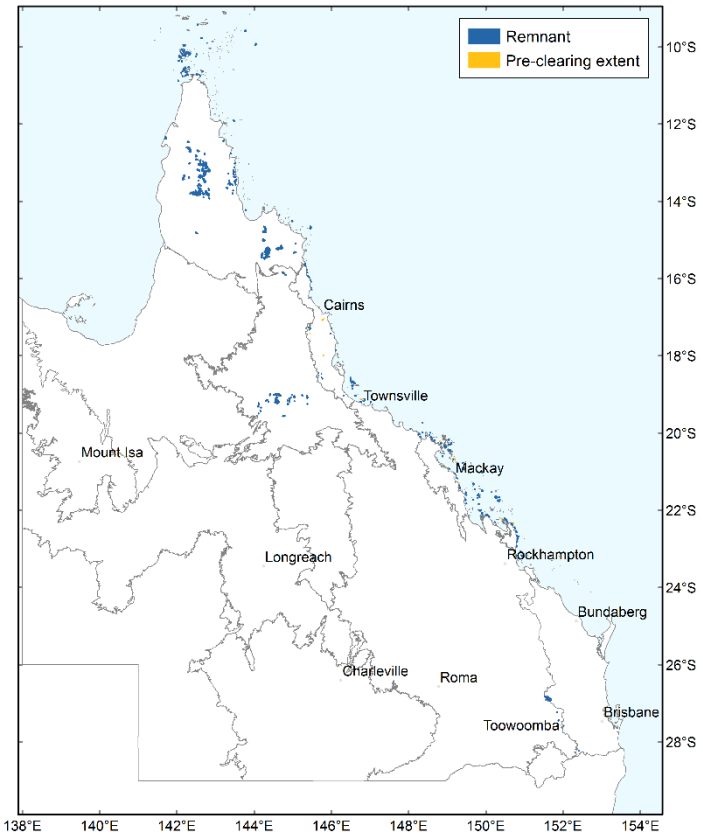


Photo 322 Tussock grassland with scattered emergent *Corymbia confertiflora* and *Eucalyptus chlorophylla,* 3.5.29. 60 km north of Laura in Lakefield NP, CYP.

(VJ Neldner)

Floristic characteristics: These grasslands are frequently dominated by *Themeda triandra, Heteropogon triticeus, H. contortus, Sarga plumosum, Imperata cylindrica* or *Mnesithea rottboellioides*, or a combination of these species. *Alloteropsis semialata, Paspalum scrobiculatum,* and *Capillipedium parviflorum* are also frequently present. Frequent forbs

include *Phyllanthus virgatus, Evolvulus alsinoides, Crotalaria montana, Cassytha filiformis, Cyanthillium cinereum, Pycnospora lutescens, Flemingia parviflora, Rhynchosia minima, Glycine tomentella* and *Brunoniella australis.* Areas of open woodland dominated by tree species such as *Corymbia papuana* (ghost gum) or *Terminalia* spp. or *Vachellia ditricha* or *Piliostigma malabaricum* are also included in this BVG.

Table 88 Five most extensive regional ecosystems included in BVG 32b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.9.5	*Corymbia papuana* ± *Eucalyptus leptophleba* open woodland on rolling plains	31,548	31,525	100	OC
3.3.59	*Sarga plumosum* closed tussock grassland on erosional plains	15,008	15,007	100	NC
3.9.7	*Piliostigma malabaricum* tall open shrubland on central clay plains	14,717	14,625	99	NC
9.3.26a	Grasslands on non-basalt derived alluvial	5,242	5,217	100	OC
8.12.13a	*Themeda triandra* and/or *Imperata cylindrica* and/or *Chionachne cyathopoda* tussock grassland, or *Xanthorrhoea latifolia* shrubland, on slopes of islands and headlands	4,425	3,967	90	OC

Photo 323 *Corymbia papuana* open woodland on rolling plains, 3.9.5. North of Coen, CYP.
(VJ Neldner)

Photo 324 *Pilidiostigma malabaricum* tall open shrubland on plain, 3.9.7. 62 km N of Archer River on the PDR, CYP.
(MR Newton)

Photo 325 *Themeda triandra* tussock grassland with *Xanthorrhoea latifolia* subsp*. latifolia,* 8.12.13a. St Bees Island, CQC.
(JE Kemp)

33 Hummock grasslands dominated by *Triodia* spp. (spinifex) or *Zygochloa paradoxa* (sandhill canegrass) associations on dunefields or sandplains

33a Hummock grasslands dominated by *Triodia basedowii* (hard spinifex) or *Zygochloa paradoxa* (sandhill canegrass) associations on dunefields or sandplains

Pre-clearing area: 3,682,062 ha

Remnant 2017 area: 3,678,639 ha (99.9% of pre-clearing)

Bioregions: CHC (99.1%), MGD (0.6%), MUL (0.2%), NWH (0.1%)

Land zones: 6 (100%)

Mean annual rainfall range: <200 mm - 300 mm

Typical landforms: Inland Aeolian dunes and sand plains

Typical soils: Arenic Rudosols

Structural formation range: Hummock grassland to open hummock grassland, open forbland

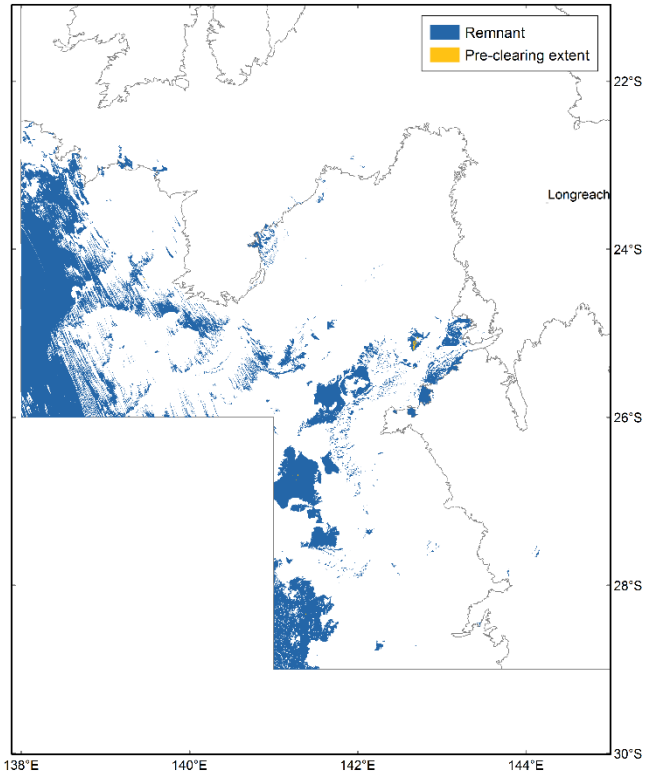


Photo 326 *Crotalaria eremaea and Acacia murrayana* shrubs on crests with *Triodia basedowii* hummock grassland on dune, 5.6.5. Plains dominated by *Triodia* spp. hummock grassland, 5.6.6. CHC. (D. Richter)

Floristic characteristics: *Triodia basedowii* dominates these extensive hummock grasslands. *Zygochloa paradoxa* or *Crotalaria eremaea* may dominate on some of dune crests. In some areas, the grasslands are very sparsely wooded with *Acacia* spp., *Senna* spp., *Grevillea* spp. and/ or *Eucalyptus* species. Tussock grasses and forbs occur scattered between the *T. basedowii* hummocks, and include *Aristida holathera, Triraphis mollis, Boerhavia pubescens, Calotis erinacea, Euphorbia myrtoides, Chenopodium desertorum* subsp*. anidiophyllum, Chrysocephalum eremaeum, Crotalaria cunninghamii, Cullen pallidum, Enchylaena tomentosa, Polymeria ambigua, Scaevola depauperata* and *Sida platycalyx.*

Table 89 Five most extensive regional ecosystems included in BVG 33a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.6.5a	Variable sparse to open-herbland or *Triodia basedowii* hummock grassland on dune flanks, crests and sandy interdunes	2,449,892	2,449,422	100	NC
5.6.6	*Triodia basedowii* hummock grassland wooded with *Acacia* spp., *Senna* spp., *Grevillea* spp. ± *Eucalyptus* spp. on sand plains and dune fields	317,429	314,592	100	NC
5.6.8a	*Zygochloa paradoxa* or *Crotalaria eremaea* +/- *Triodia basedowii* open grassland on sand dunes	301,738	301,730	99	NC
5.6.1	*Crotalaria eremaea* ± *Eragrostis eriopoda* open forbland on isolated and/or deflated sand dunes on alluvium	189,039	189,034	100	NC
5.6.7	*Triodia basedowii* hummock grassland +/- *Eucalyptus pachyphylla* on low sand dunes and sand plains	171,221	171,213	100	NC

Photo 327 *Triodia basedowii* hummock grassland with *Eucalyptus pachyphylla* mallee shrubs on sandplain, 5.6.7. West of Glenormiston, CHC.
(VJ Neldner)

Photo 328 *Crotalaria eremea* open forbland, 5.6.8. On mobile dune crest, CHC.
(BA Wilson)

Photo 329 *Triodia basedowii* hummock grassland with *Corymbia terminalis* and *Grevillea striata* emergents, 5.6.6. South of Jundah, CHC.
(VJ Neldner)

Photo 330 *Triodia basedowii* hummock grassland, 5.6.5. Ethabuka, CHC.
(VJ Neldner)

33b Hummock grasslands dominated by *Triodia pungens* or *T. longiceps* (giant grey spinifex) or *T. mitchellii* (buck spinifex) sandplains or lateritic surfaces

Pre-clearing area: 941,694 ha

Remnant 2017 area: 919,183 ha (97.6% of pre-clearing)

Bioregions: MGD (47%), CHC (17%), MUL (13%), NWH (11%), GUP (6%), DEU (6%), BRB (1%)

Land zones: 7 (62%), 5 (18%), 6 (13%), 9 (3%), 11 (3%), 3 (0.5%)

Mean annual rainfall range: 200-500 mm

Typical landforms: Deflated dunes and sand plains

Typical soils: Arenic Rudosols and Red Orthic Tenosols

Structural formation range: Hummock grassland; sparsely wooded in some areas.

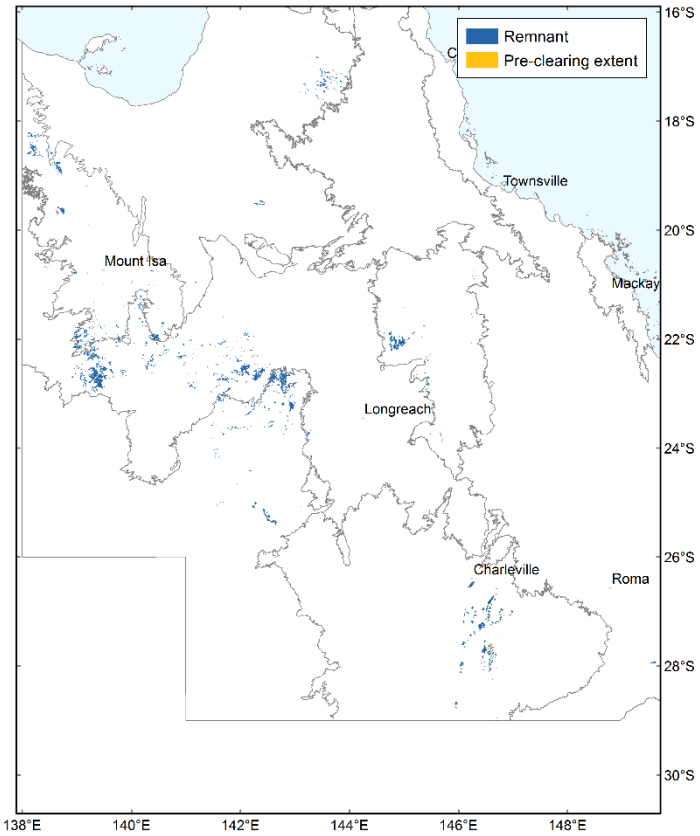


Photo 331 *Triodia* spp. hummock grassland with emergent *E. leucophloia* and *E. nomantonensis* on deeply weathered Cretaceous mudstones. Near Dajarra.

(CN Appelman)

Floristic characteristics: These hummock grasslands are dominated by *Triodia pungens* or *T. longiceps* or *T. mitchellii*. They are generally sparsely wooded with emergent *Eucalyptus melanophloia, Eucalyptus* spp., *Corymbia* spp. and *Acacia* spp. *Fimbristylis dichotoma, Eriachne ciliata, E. mucronata, Schizachyrium fragile, Tripogon loliiformis, Aristida holathera, A. contorta, Bulbostylis barbata, Panicum effusum, Paspalidium rarum* and *Sporobolus australasicus* are frequent graminoids that may be present. Frequent forbs include *Evolvulus alsinoides, Zornia muriculata, Cheilanthes sieberi, Sphaeromorphaea littoralis*, *Indigofera linifolia, Oldenlandia mitrasacmoides, Buchnera linearis, Calandrinia pleiopetala* and *Chrysocephalum apiculatum* and *Stackhousia viminea.*

Table 90 Five most extensive regional ecosystems included in BVG 33b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.7.2x1a	*Triodia* spp. hummock grassland +/- emergent *Eucalyptus leucophloia, Acacia shirleyi on eroding Tertiary lateritic plateaux derived from deeply weathered Mesozoic sediments*	256,422	256,373	100	NC
6.6.2	*Triodia mitchellii* ± *T. marginata hummock grassland wooded with Eucalyptus melanophloia* ± *Eucalyptus* spp. *and Acacia spp. on low dunes*	118,760	101,266	85	NC
4.7.2x1c	*Triodia spp.* hummock grassland +/- emergent *Eucalyptus leucophloia, A. aneura* on intact lateritic plateau surfaces derived from deeply weathered Cretaceous mudstones	114,061	113,940	100	NC
5.5.6a	*Corymbia terminalis* low open woodland with *Triodia pungens*	99,433	97,454	98	OC
5.7.15	*Triodia longiceps +/- Triodia* spp. hummock grassland on talus slopes of dissected tablelands and residuals	54,998	54,581	99	NC

Photo 332 *Triodia longiceps* hummock grassland, 1.5.12. Mt Tracey Station, east of Cloncurry, NWH. (DT Kelman)

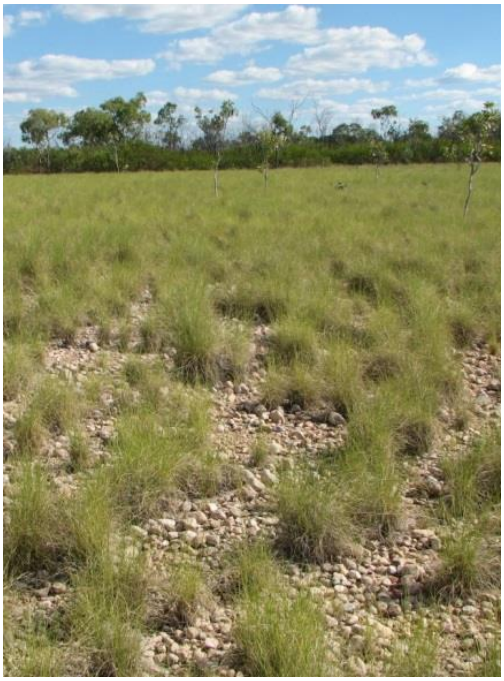


Photo 333 *Triodia bitextura* grassland on dissected Tertiary sandstone, 2.7.1x6. Abingdon Downs Station, NNW of Georgetown, GUP. (CN Appelman)

Photo 334 *Triodia mitchellii* hummock grassland with emergent *Eucalyptus melanophloia*, 6.6.2. Near Bollon, MUL. (TJ Eyre)

34 Wetlands associated with permanent lakes and swamps, as well as ephemeral lakes, claypans and swamps. Includes fringing woodlands and shrublands

34a Lacustrine wetlands. Lakes, ephemeral to permanent, fresh to brackish; water bodies with ground water connectivity. Includes fringing woodlands and sedgelands

Pre-clearing area: 597,150 ha

Remnant 2017 area: 593,044 ha (989.3% of pre-clearing)

Bioregions: CHC (86%), DEU (7%), MUL (3%), CYP (1%), BRB (1%), SEQ (0.3%), CQC (0.3%), GUP (0.3%), WET (0.1%)

Land zones: 3 (99%), 2 (1%)

Mean annual rainfall range: <200 - >2600 mm

Typical landforms: Sparsely vegetated to bare, large saline lakes; terminal lakes on drainage lines and floodplains; permanent and semi-permanent lakes in coastal dunefields and volcanic craters

Typical soils: Hydrosols

Structural formation range: Open water to bare saline lakes, sometimes with fringing woodland

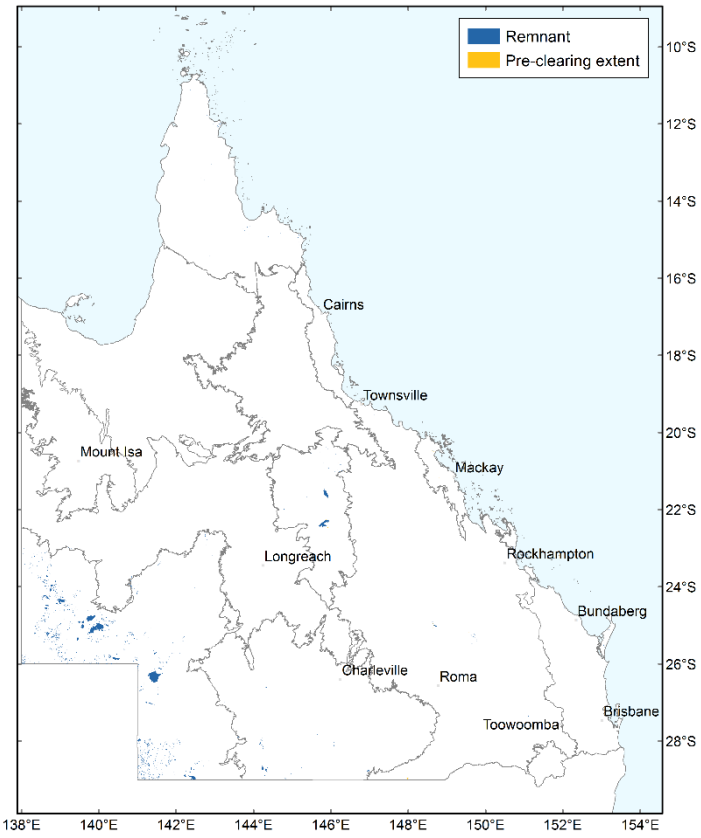


Photo 335 Herbland and open water, 5.3.22b. Lake Machattie, CHC. (N Cuff)

Floristic characteristics: The ephemeral saline lakes vary from open water to bare soil to a variety of species forming ephemeral herblands, depending on the flooding cycle. Permanent lakes often have aquatic plants in the shallow water at the edge, with open water elsewhere.

Table 91 Five most extensive regional ecosystems included in BVG 34a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.3.22a	Sparse herbland, open water or bare areas on lakes and larger clay pans within interdunes and sandplains	300,982	300,976	100	NC
5.3.22b	Sparse herbland, open water or bare area on lakes	211,631	211,631	100	NC
10.3.24	Ephemeral lake bed (Lake Buchanan)	16,706	16,706	100	OC
6.3.10a	Water/bare areas of saline lakes	9,299	9,299	100	NC
10.3.23a	*Tecticornia* spp. open succulent shrubland (Lake Galilee)	8,504	8,437	99	OC

Photo 336 *Tecticornia* spp. open succulent shrubland, 10.3.23a. Lake Galilee, DEU. (EJ Thompson)

Photo 337 *Eleocharis* sp. and *Nymphaea* sp. on perennial lagoon, 3.3.66b. Horseshoe Lagoon, Lakefield NP, CYP. (MR Newton)

Photo 339 *Lepironia articulata* open sedgeland around the margins of perennial lake, 3.2.27a. Sach Waterhole, near Bamaga, CYP. (VJ Neldner)

Photo 338 *Lepironia articulata* open sedgeland, 12.2.15f. Lake Benaroon, Fraser Island, SEQ. (VJ Neldner)

34b Palustrine wetlands. Generally intermittent swamps/claypans (non floodplains) in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs

Pre-clearing area: 831,323 ha

Remnant 2017 area: 814,687 ha (98.0% of pre-clearing)

Bioregions: CHC (64%), MUL (24%), MGD (7%), DEU (6%), BRB (0.5%)

Land zones: 3 (99.5%), 5 (minor)

Mean annual rainfall range: <200-600 mm

Typical landforms: Saline, non-floodplain claypans and intermittent swamps

Typical soils: Salic Hydrosols

Structural formation range: Bare saline claypans, occasionally flooded.

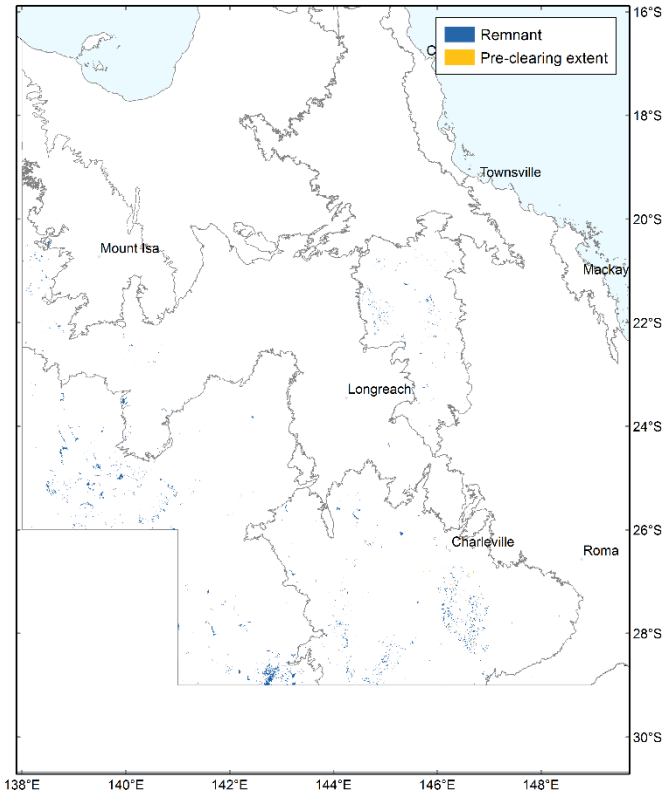


Photo 340 *Eragrostis australasica* open tussock grassland with *Marsilea* sp. ephemeral swamp, 5.3.16a. Between Diamantina River and Farrars Creek catchments, CHC.
(R Jaensch)

Floristic characteristics: The claypans vary from bare soil to a variety of species forming ephemeral herblands, depending on the flooding cycle. *Eragrostis australasica* open grasslands are frequent on many of the claypans; in others, *Chenopodium auricomum* with or without *Duma florulenta* form open shrublands. *Tecticornia* spp. open succulent shrublands are sometimes present, and in many claypans only a sparse herbland occurs after flooding.

Table 92 Five most extensive regional ecosystems included in BVG 34b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.3.16a	*Eragrostis australasica* open grassland on clay pans between dunes and on plains	313,116	313,056	100	NC
6.3.11b	Bare or water in claypans	87,511	82,032	100	OC
5.3.22d	Sparse herbland, open water or bare areas on smaller clay pans within interdunes and sandplains	70,662	70,643	94	NC
6.3.11	Bare or water in claypans	46,507	44,433	96	OC
6.3.12	*Acacia omalophylla* +/- *A. microsperma* +/- *Eucalyptus coolabah* tall open shrubland on alluvium	36,595	31,423	86	OC

Photo 341 *Sesbania* sp. fringing floodplain water hole, 5.3.22a. Lake Constance, Diamanina NP, CHC. (BA Wilson)

Photo 342 *Eragrostis australasica* sparse tussock grassland on claypans, 5.3.16a, CHC.
(N Cuff)

Photo 343 *Eragrostis australasica* open tussock grassland on claypans, 6.3.11b, MUL.
(R Jaensch)

Photo 344 *Eragrostis setifolia* clay pan between dunes, 5.3.22a. South of Carranya Station Homestead, CHC.
(D Richter)

34c Palustrine wetlands. Freshwater swamps on coastal floodplains dominated by sedges and grasses such as *Oryza* spp., *Eleocharis* spp. (spikerush) or *Baloskion* spp. (cord rush) / *Leptocarpus tenax* / *Gahnia sieberiana* (sword grass) / *Lepironia* spp. Includes small areas of estuarine wetlands

Pre-clearing area: 239,475 ha

Remnant 2017 area: 236,260 ha (98.7% of pre-clearing)

Bioregions: GUP (39%), CYP (35%), BRB (8%) SEQ (10%), WET (6%), CQC (1%)

Land zones: 3 (86%), 2 (12%), 1 (2%)

Mean annual rainfall range: 600 - >1600 mm

Typical landforms: Seasonally inundated marine plains; coastal freshwater swamps

Typical soils: Aquic or Grey Vertosols, Semiaquic Podosols, Aeric Podosols

Structural formation range: Closed sedgeland to closed tussock-grassland

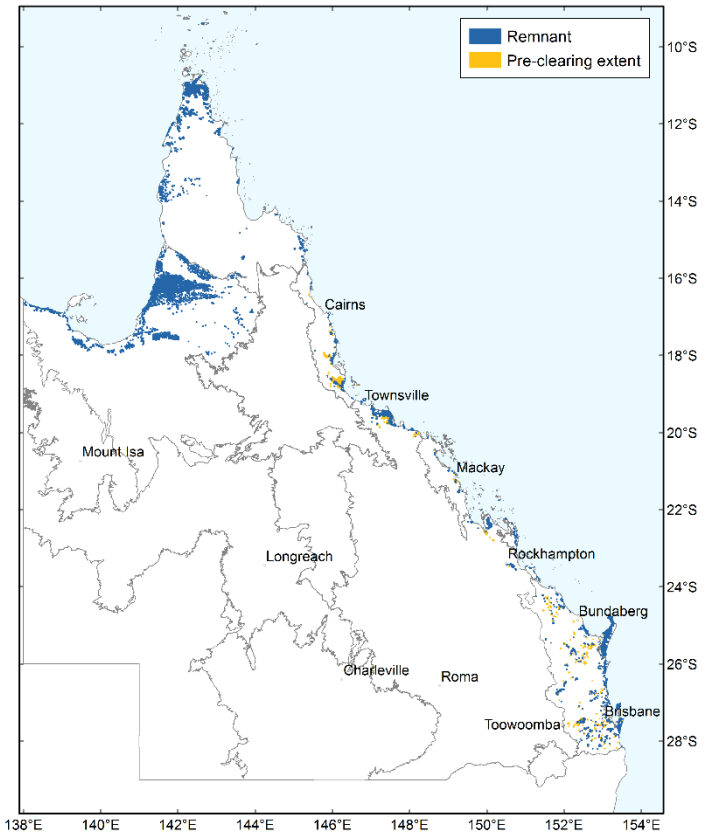


Photo 345 Aerial view of *Baloskion tetraphyllum* subsp. *meiostachyum* open sedgeland in drainage swamps in dunefields, 3.3.64. South of Jardine River, CYP. (VJ Neldner)

Floristic characteristics: The seasonally inundated marine plains are frequently dominated by *Eleocharis, Oryza* and *Ischaemum* species. Other frequent graminoids are *Schoenoplectus litoralis, Fimbristylis schoenoides, Sporobolus virginicus* and *Xerochloa imberbis*. *Baloskion tetraphyllum* subsp. *meiostachyum* open sedgelands or *Gahnia sieberiana, Empodisma minus, Gleichenia* spp. closed sedgeland occur in the coastal drainage swamps. *Tricostularia*

undulata, Eriocaulon spp., *Schoenus sparteus, S. calostachyus, Rhynchospora rubra, Utricularia* spp. and *Drosera* spp. are frequent herbs in these coastal swamps.

Table 93 Five most extensive regional ecosystems included in BVG 34c

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
3.3.64	*Baloskion tetraphyllum* subsp. *meiostachyum* open sedgeland in swamps in dune fields	60,552	60,471	100	NC
2.3.55b	*Melaleuca clarksonii* and/or *M. viridiflora* low open woodland in seasonal swamps on Quaternary deposits in the Mitchell-Gilbert Fans subregion.	50,205	50,166	100	NC
2.3.2a	Seasonal swamps in closed depressions on low elevated coastal alluvial plains adjacent to the tidal zone.	40,383	40,255	100	NC
3.3.63	*Eleocharis dulcis* dominated closed sedgeland on seasonally flooded marine plains	15,942	15,759	99	OC
12.2.15	*Gahnia sieberiana, Empodisma minus, Gleichenia* spp. closed sedgeland in swamps	15,496	15,226	98	NC

Photo 346 Seasonal swamp with aquatic species including *Nymphaea* spp. and *Nymphoides* spp. and a fringing band of *Asteromyrtus symphiocarpa* and *Melaleuca viridiflora*, 2.3.28x11. Staaten River NP, GUP. (GW Wilson)

Photo 347 *Eleocharis* spp. closed sedgeland fringing freshwater inlet on flooded marine plain, 3.3.63. North of Starcke NP., CYP. (MR Newton)

Photo 348 Sedgeland dominated by *Eleocharis* spp., *Juncus* spp. and *Pseudoraphis spinescens*. Fringed by *Eucalyptus camaldulensis* open woodland, 12.3.8. Rosewood, SEQ. AL Kelly)

34d Palustrine wetlands. Freshwater swamps or billabongs on floodplains ranging from permanent and semi-permanent to ephemeral

Pre-clearing area: 364,107 ha

Remnant 2017 area: 342,233 ha (94.0% of pre-clearing)

Bioregions: GUP (60%), EIU (12%), MGD (10%), BRB (9%), CYP (6%), CHC (3%), NWH (0.6%), MUL (0.1%), SEQ (0.1%), DEU, WET (minor)

Land zones: 3 (99%), 1 (1%)

Mean annual rainfall range: 300-1600 mm

Typical landforms: Permanent or seasonal wetlands, including waterholes and billabongs on drainage lines

Typical soils: Grey Vertosols

Structural formation range: Open water to floating herbland, frequently fringed by woodland

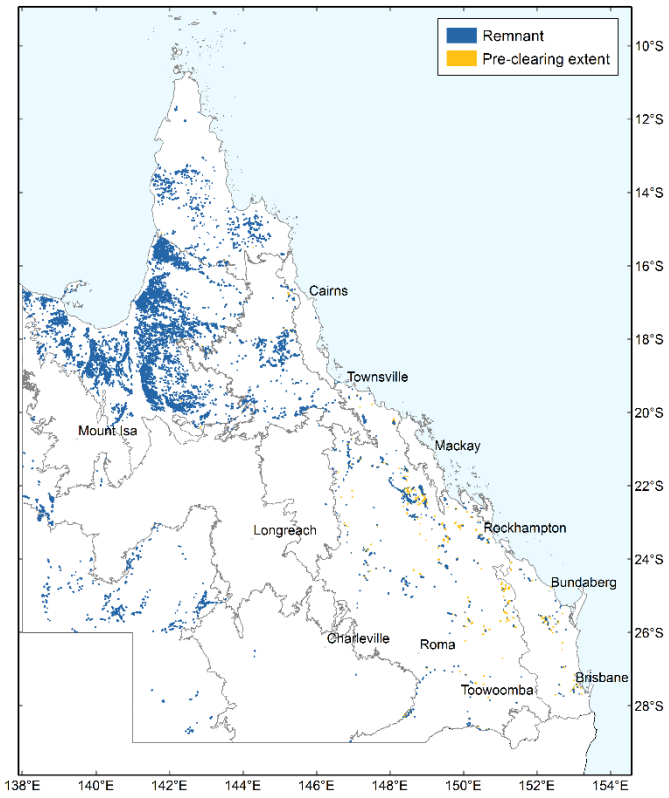


Photo 349 Waterhole in an abandoned river channel, 2.3.16. Broadwater Station, south of Normanton, GUP.

(CN Appelman)

Floristic characteristics: The waterholes and billabongs on drainage lines and circular waterholes on floodplains, often have fringing woodlands of *Eucalyptus camaldulensis* or *E. coolabah* or *E. microtheca*. Frequent graminoids include *Pseudoraphis spinescens, Eleocharis sphacelata,* and *Cynodon dactylon.* Frequent forbs are *Ludwigia peploides* subsp. *montevidensis, Alternanthera denticulata, Azolla pinnata, Aeschynomene indica, Marsilea mutica, M. hirsuta, Ammannia multiflora, Najas tenuifolia* and *Glinus lotoides.*

Table 94 Five most extensive regional ecosystems included in BVG 34d

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
4.3.11e	*Eucalyptus coolabah* +/- *E. camaldulensis*, *Lysiphyllum gilvum*, *Acacia georginae* low woodland fringing billabongs in braided watercourses around the Georgina River	35,170	35,157	100	NC
2.3.16	Billabongs (abandoned channels) in Quaternary alluvial plains, fringed with *Eucalyptus camaldulensis* and/or *E. microtheca*.	31,725	31,458	99	OC
2.3.33a	*Eucalyptus microtheca* and/or *Acacia cambagei* +/-low woodland in seasonal swamps in Quaternary residual sandsheets.	27,107	27,076	100	OC
2.3.51	Seasonal swamps. *Eucalyptus camaldulensis* +/- *Melaleuca viridiflora* open woodland in closed depressions on Tertiary sand sheets	23,544	23,365	99	NC
2.3.34f	Seasonal swamps with a fringe of *Eucalyptus microtheca* and *Excoecaria parvifolia* on active Quaternary alluvial plains (outer zones of river deltas)	23,459	23,346	100	NC

Photo 350 *Corymbia polycarpa, Eucalyptus microtheca* and *Melaleuca viridiflora* woodland around a permanent lagoon, 2.3.16. Long Reach Lagoon, adjacent to the Burke Development Road, NNW of Bulimba, NWH.
(GW Wilson)

Photo 351 Permanent lagoon with fringing woodland, 2.3.16. Lochnager Outstation Lagoon, Rutland Plains, GUP.
(MR Newton)

34e Palustrine wetlands. Springs with water dependent herbs

Pre-clearing area: 5,528 ha*

Remnant 2017 area: 5,512 ha* (99.7% of pre-clearing)

Bioregions: GUP (61%), NWH (31%), MGD (3%), MUL (2%), CYP (1.4%), DEU (0.4%), EIU (0.2%)

Land zones: 3 (50%), 10 (44%), 7 (6%)

Mean annual rainfall range: 200-2000 mm

Typical landforms: Discharge springs often occurring on flat alluvial plains. Recharge springs are frequently located in fine-grained sedimentary rocks, basalt and metamorphic rocks.

Typical soils: Hydrosols

Structural formation range: Sedgelands, forblands or grasslands.

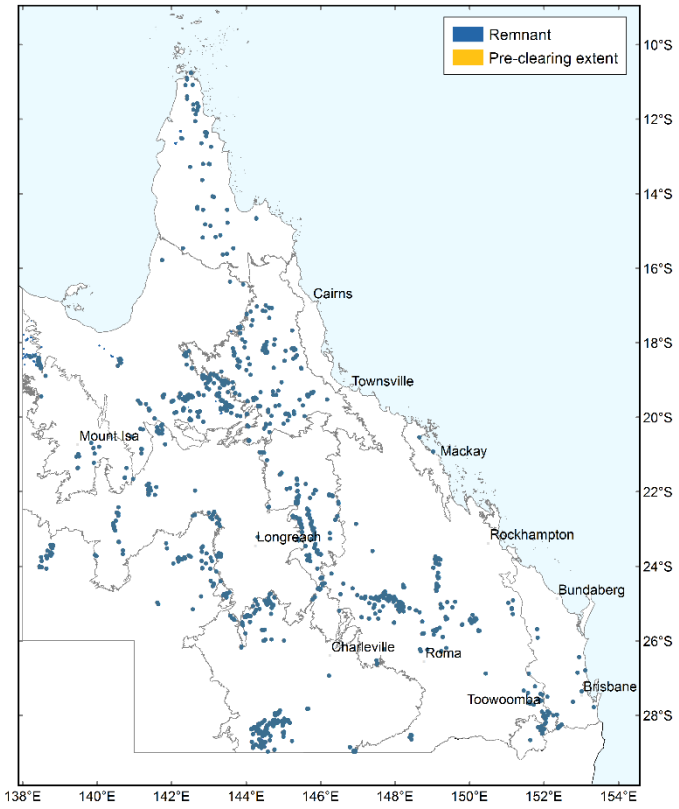


Photo 352 Discharge spring, 6.3.23. Granite Springs, near Eulo, MUL. (J Silcock)

Floristic characteristics: The spring's vegetation varies greatly with the spring flow, water salinity, disturbance by stock, and sediment disposition. A variety of sedges, forbs and grasses can occur in the springs. Some support highly restricted plant species such as *Arthraxon hispidus, Eriocaulon carsonii, Eryngium fontanum, Myriophyllum artesium, Sporobolus pamelae* and *Thelypteris confluens*. The fish species *Chlamydogobius micropterus, C. squamigera* and *Scaturiginichthys vermeilipinnis* are restricted to springs and listed as endangered or vulnerable in the *EPBC Act*.

* Restricted habitats of high conservation significance. The extent figures are inflated by the inclusion of small areas of surrounding habitats.

Table 95 Five most extensive regional ecosystems included in BVG 34e

RE	Description	Pre-clear area (ha)*	Remnant 2017 (ha)*	% remaining	Status
1.10.6	Springs mostly associated with quartzose sandstone and fine-grained sedimentary rocks (limestone)	1,778	1,778	100	E
2.3.39a	Springs on recent alluvium	1,744	1,740	100	E
2.3.39	Springs on recent alluvium	703	703	100	E
2.10.8	Springs associated with quartzose sandstone or lateritised sandstone gullies and gorges	527	526	100	NC
2.7.3x6	Springs on margins of Tertiary lateritic plateaux and deeply weathered siltstone formations.	343	343	100	E

The REs from this BVG 2.3.39, 4.3.22, 5.3.23, 6.3.23, 10.3.31 and 11.3.22 form the *EPBC Act* endangered listed community of native species dependent on natural discharge of groundwater from the Great Artesian Basin.

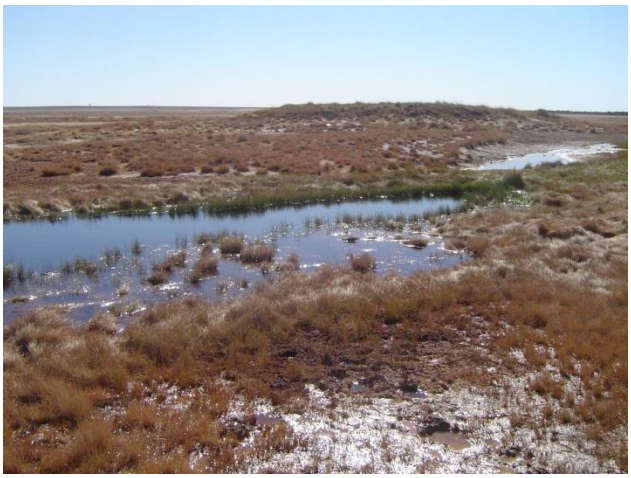


Photo 353 Discharge spring, 4.3.22. Elizabeth Springs Conservation Park, SE of Boulia, MGD.
(VJ Neldner)

Photo 354 *Sporobolus pamelae* tussock grassland associated with springs fed from the Great Artesian Basin, 10.3.31a. Edgbaston Station, NE of Aramac, DEU.
(EJ Thompson)

Photo 355 Discharge mound spring, 11.3.22. Boggomoss Nature Reserve, BRB.
(C Pennay)

Photo 356 Discharge spring with peat mound dominated by *Melaleuca leucadendra*, 2.3.39. NNW of Richmond, GUP.
(RJ Fensham)

34f Palustrine wetlands. Sedgelands/grasslands on seeps and soaks on wet peaks, and other coastal non-floodplain features

Pre-clearing area: 6,603 ha*

Remnant 2017 area*: 3,939 ha* (59.5% of pre-clearing)

Bioregions: WET (62%), SEQ (31%), NET (5%), CYP (2%)

Land zones: 3 (59%), 9-10 (31%), 12 (6%), 5 (2%), 11 (1%)

Mean annual rainfall range: >1200-2000 mm

Typical landforms: Coastal lowlands and depression on mountain ranges

Typical soils: Semiaquic Podosols, Aeric Podosols

Structural formation range: Sedgeland, grassland, through to low woodland

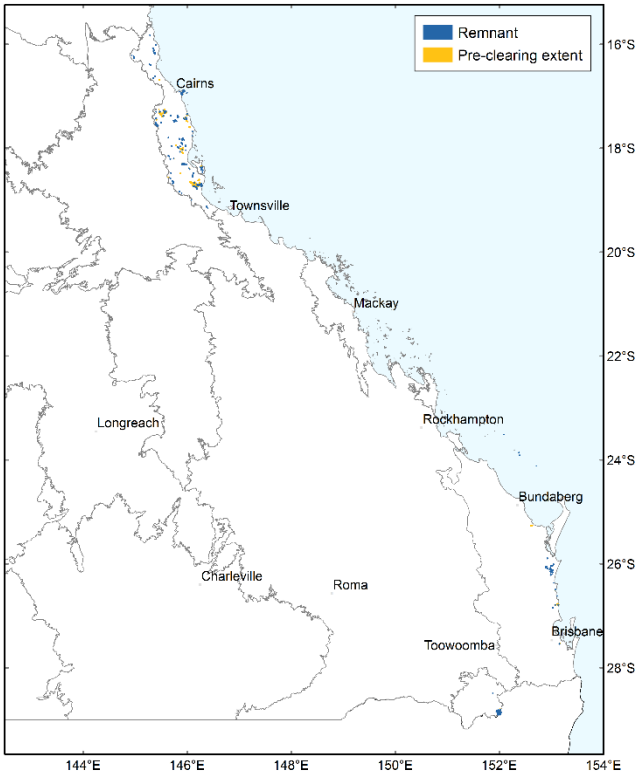


Photo 357 Graminoid swamp, 7.3.2. Mt Quincan, WET.
(AJ Ford, CSIRO).

Floristic characteristics: A complex of sedgelands, grasslands, fernlands and forblands occurs in the semi-permanent swamps of the coastal lowlands. Frequent species are *Cyperus lucidus, Actinoscirpus grossus, Lepironia articulata, Scleria poiformis, Gahnia sieberiana, Isachne globosa,* and *Blechnum indicum*. *Allocasuarina littoralis, Melaleuca quinquenervia, Rhodomyrtus trineura, Melastoma malabathricum* shrubland to low woodland may occur on the uplands.

* Restricted habitats of high conservation significance. The extent figures are inflated by the inclusion of small areas of surrounding habitats.

Table 96 Five most extensive regional ecosystems included in BVG 34f

RE	Description	Pre-clear area (ha)*	Remnant 2017 (ha)*	% remaining	Status
12.9-10.22	Closed sedgeland/shrubland on sedimentary rocks. Coastal parts	2,076	1,358	65	OC
7.3.29a	Complex of sedgelands, grasslands, fernlands and forblands of semi-permanent swamps of coastal lowlands.	2,041	835	41	E
7.3.31	*Lepironia articulata* sedgeland to open sedgeland of permanently to semi-permanently inundated peat swamps of alluvial plains	622	532	85	E
7.3.39c	Ephemeral freshwater swamp of upland drainage depressions	570	185	33	E
7.12.37g	*Allocasuarina littoralis, Melaleuca quinquenervia, Rhodomyrtus trineura, Melastoma malabathricum, Gahnia sieberiana* sedgeland to shrubland to low woodland on uplands on granite and rhyolite	299	298	100	E

Photo 358 Swamp of open water fringed by zoned herbland of *Persicaria* spp., *Eleocharis* sp. and swamp grasses, 7.3.39c. Hasties Swamp, Atherton Tablelands. WET. (JE Kemp)

Photo 359 *Sesuvium portulacastrum* herbland, 12.2.17c. In depression, Fairfax East Island, Capricornia Cays NP, SEQ. (DA Halford)

Photo 360 Sedgeland, 13.3.6. Girraween NP, NET. (MT Mathieson).

Photo 361 Graminoid swamp, 7.3.2. Lynch's Crater, WET.
(AJ Ford, CSIRO).

34g Palustrine wetlands. Generally intermittent swamps/claypans on floodplains in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs

Pre-clearing area: 1,968,001 ha

Remnant 2017 area: 1,967,718 ha (100% of pre-clearing)

Bioregions: CHC (98%), MGD (1.7%), DEU (0.2%), GUP, MUL, NWH (minor)

Land zones: 3 (100%)

Mean annual rainfall range: 200-400 mm

Typical landforms: Broad drainage channels and floodplains

Typical soils: Grey Vertosols, and Rudosols

Structural formation range: Open tussock grassland through to open shrubland.

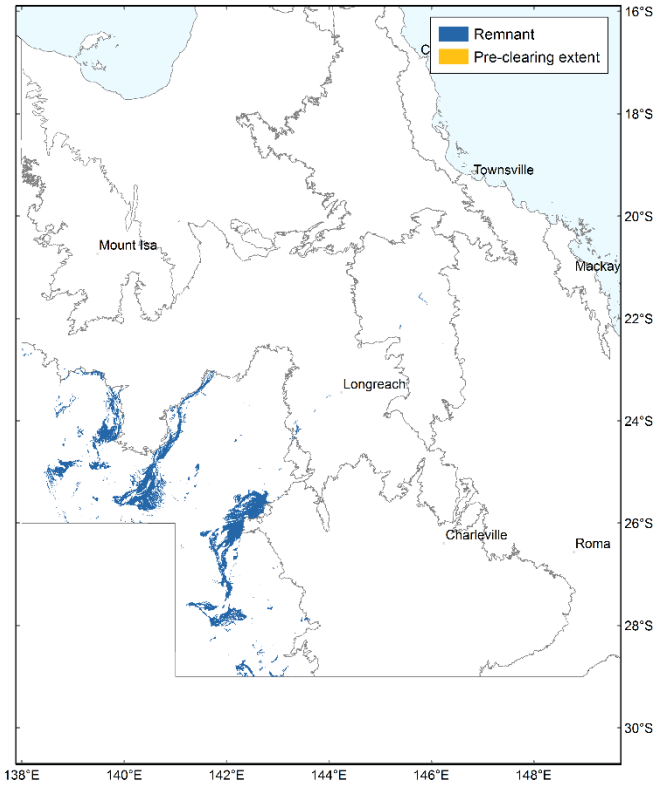


Photo 362 *Chenopodium auricomum*, *Duma florulenta* open shrubland, 5.3.12a. Cooper Creek, CHC.

(R Jaensch)

Floristic characteristics: *Chenopodium auricomum* with or without *Duma florulenta* form open shrublands. *Tecticornia* spp. open succulent shrublands are sometimes present. *Eragrostis australasica* open grassland also occurs on the flood plains. The shrubs *Acacia salicina* and *Atriplex nummularia* are occasionally present. Frequently present graminoids are *Eragrostis sororia, E. speciosa, E. lacunaria, Fimbristylis dichotoma, Perotis rara, Aristida holathera* var. *holathera, Astrebla pectinata, Dactyloctenium radulans, Digitaria ammophila* and *Enteropogon acicularis. Marsilea drummondii, Waltheria indica, Alternanthera nodiflora, Atriplex semibaccata, A. spongiosa, Euphorbia drummondii, Dissocarpus biflorus* and *Sphaeromorphaea littoralis* are frequent forbs.

Table 97 Six most extensive regional ecosystems included in BVG 34g

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
5.3.18a	*Chenopodium auricomum* open shrubland on braided channels on flooded alluvial plains	951,076	951,040	100	NC
5.3.12a	*Chenopodium auricomum* ± *Duma florulenta* open shrubland in depressions on floodplains	466,915	466,879	100	NC
5.3.13a	*Duma florulenta* open shrubland in depressions or fringing channels on flood plains	385,931	385,924	100	NC
5.3.16b	*Eragrostis australasica* open grassland in depressions on flood plains	112,036	112,008	100	NC
4.3.24a	*Chenopodium auricomum* dwarf open shrubland *+/- Eragrostis spp.* and *Astrebla elymoides* in seasonal swamps in closed depressions	31,952	31,790	99	NC
5.3.15b	*Maireana* spp. dwarf open shrubland on alluvial plains	15,419	15,418	100	E

Photo 363 *Chenopodium auricomum* open shrubland, 5.3.18a. Diamantina River, CHC. (R Jaensch)

Photo 364 Braided channels, 5.3.18a/5.3.18b. Cooper Creek near Windorah, CHC.
(BA Wilson)

Photo 365 *Duma florulenta* open shrubland in depressions and channels on floodplains, 5.3.13a. Near the Benditoota Waterhole, Diamantina River, CHC. (D Richter)

Photo 366 *Chenopodium auricomum* open shrubland, 5.3.18a. Cooper Creek, CHC.
(VJ Neldner)

35 Mangroves and saltmarshes

35a Closed forests and low closed forests dominated by mangroves

Pre-clearing area: 482,788 ha

Remnant 2017 area: 476,271 ha (98.7% of pre-clearing)

Bioregions: CYP (32%), GUP (21%), BRB (17%), SEQ (11%), WET (10%), CQC (9%)

Land zones: 1 (100%)

Mean annual rainfall range: >1000 mm

Typical landforms: Tidal channels and unconsolidated tidal flats

Typical soils: Intratidal Hydrosols

Structural formation range: Closed forest, closed scrub to low open shrubland.

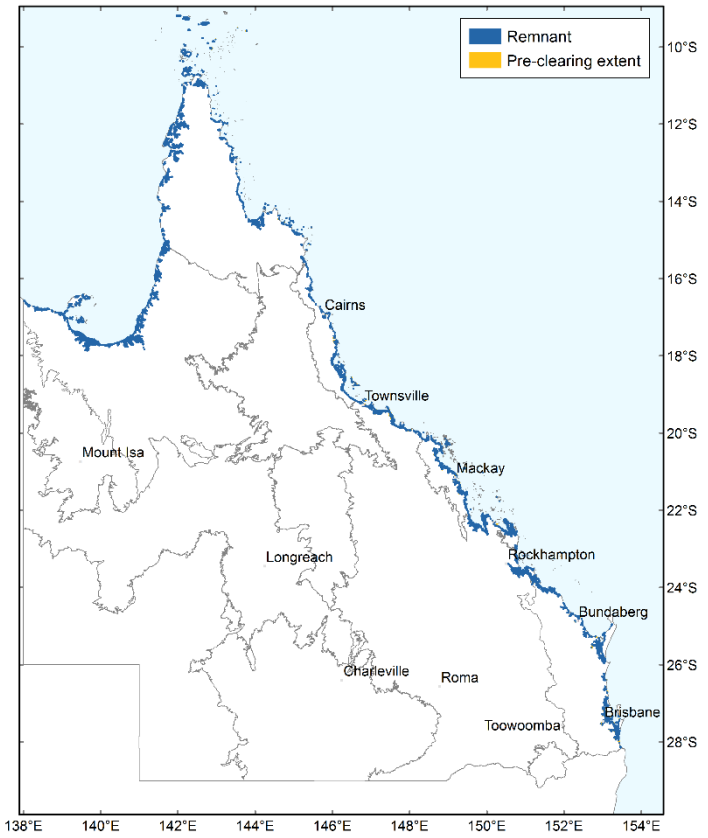


Photo 367 *Rhizophora* spp. closed forest 3.1.1 and *Ceriops* spp. low closed forest, 3.1.3. South of Weipa, CYP. (VJ Neldner)

Floristic characteristics: The mangrove communities have a higher diversity of species and complexity of structure as one proceeds north. *Rhizophora* species and *Bruguiera gymnorhiza* dominate the most seaward locations. *Avicennia marina* and *Ceriops tagal* are generally dominant in more landward locations, and species such as *Excoecaria agallocha* and

Aegiceras corniculatum dominate in the upper tidal reaches of rivers. Shrubs and herbs are rare in the mangroves, although very sparse *Tecticornia* spp. and *Sporobolus virginicus* may occur in the ground layer.

Table 98 Five most extensive regional ecosystems included in BVG 35a

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.1.3	Tidal channels and associated levees, usually with mangroves	89,891	89,806	100	NC
3.1.1	*Rhizophora stylosa* and/or *Bruguiera* spp. closed forest	64,330	64,255	100	NC
12.1.3	Mangrove shrubland to low closed forest on marine clay plains and estuaries	54,560	51,415	94	NC
7.1.1	Mangrove closed scrub to open forest of areas subject to regular tidal inundation	47,250	44,977	95	NC
3.1.3	*Ceriops tagal* and/or *C. australis* +/- *Avicennia marina* low open forest	41,505	41,486	100	NC

Photo 368 *Rhizophora stylosa* closed forest, 3.1.1a. Mouth of the Bizant River, CYP.

(VJ Neldner)

Photo 369 Aerial view of *Rhizophora / Avicennia* zones, 3.1.1. Annie River, Lakefield NP, CYP.

(VJ Neldner)

Photo 370 *Ceriops tagal* low closed forest with emergent *Avicennia marina* subsp. *australasica* on marine plain, 8.1.1. North of Camilia, CQC.

(JE Kemp)

Photo 371 *Rhizophora* spp. closed forest, 7.1.1. Hinchinbrook Island, WET.

(VJ Neldner)

35b Bare saltpans ± areas of *Tecticornia* spp. (samphire) sparse forblands and/or *Xerochloa imberbis* or *Sporobolus virginicus* (sand couch) tussock grasslands

Pre-clearing area: 746,076 ha

Remnant 2017 area: 704,667 ha (94.4% of pre-clearing)

Bioregions: GUP (56%), BRB (21%), CYP (14%), SEQ (4%), CQC (2%), WET (1%)

Land zones: 1 (100%),

Mean annual rainfall range: >1000 mm

Typical landforms: Regularly to infrequently inundated salt plains and saline flats

Typical soils: Supratidal Hydrosols, Intertidal Hydrosols, Aquic Vertosols

Structural formation range: Predominantly bare, with areas of dwarf succulent shrubland to herbland

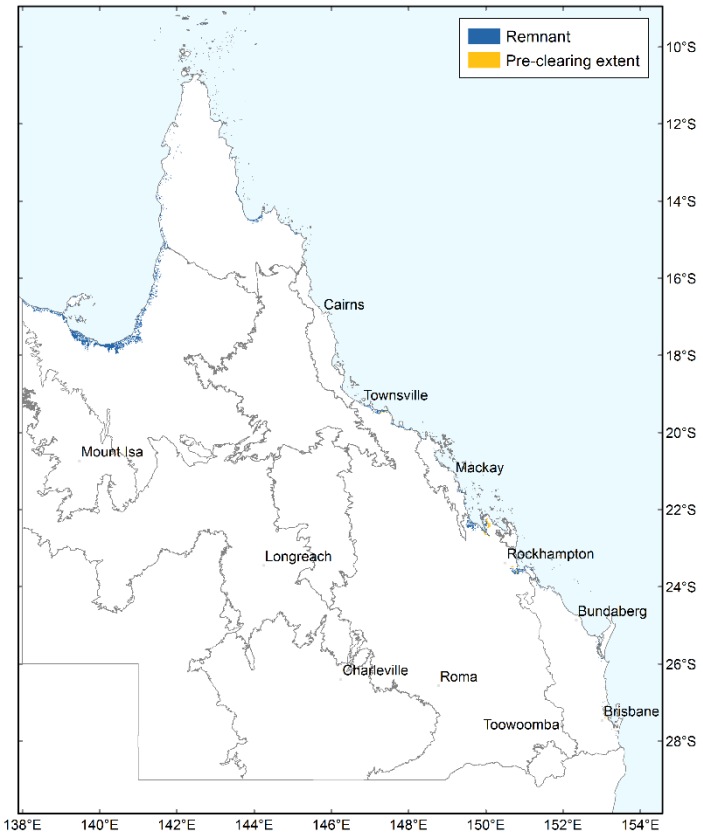


Photo 372 *Tecticornia* sp. succulent shrubland on margin of marine clay plain, 2.1.4. Inkerman Station, GUP.

(CN Appelman)

Floristic characteristics: The majority of the area is devoid of vascular plants. Patches maybe dominated by *Sporobolus virginicus,* with *Fimbristylis ferruginea, F. polytrichoides, Schoenoplectus litoralis, Cyperus scariosus, Leptochloa fusca* and *Xerochloa imberbis* frequent graminoids. *Suaeda australis, Sarcocornia quinqueflora* subsp*. quinqueflora,*

Tecticornia indica, T. pergranulata subsp. *queenslandica* and *Sesuvium portulacastrum* are forbs that can dominate some areas.

Table 99 Five most extensive regional ecosystems included in BVG 35b

RE	Description	Pre-clear area (ha)	Remnant 2017 (ha)	% remaining	Status
2.1.4	Infrequently inundated clay plains and low samphire rises	428,193	428,188	100	NC
3.1.6	Sparse herbland or bare saltpans on salt plains and saline flats	92,142	92,087	100	NC
11.1.2a	Bare mud flats on marine clay plains	88,833	80,168	90	NC
11.1.1	*Sporobolus virginicus* grassland on marine clay plains	39,413	19,813	50	NC
12.1.2	Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains	31,709	27,193	86	NC

Regional Ecosystem 12.1.2 (South of 23.5ºS) from this BVG form part of the *EPBC Act* vulnerable listed Subtropical and Temperate Coastal Saltmarsh ecological community.

Photo 373 *Fimbristylis* sp. sedgeland 3.1.6. South of Bathurst Heads along edge of narrow salt pan, CYP.
(MR Newton)

Photo 374 Sedgeland, 8.1.3, CQC.
(RM Lovatt)

Photo 375 Samphire forbland on marine plain. 11.1.2. Huttonvale Sector, Shoalwater Bay Training Area, BRB.
(AL Kelly)

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APPENDICES

Appendix 1 Key to Broad Vegetation Groups

First level of key to Broad Vegetation Groups

1. Vegetation with a closed canopy dominated by rainforest# trees (>2m tall) ..…..…….. **Table A**

2. Vegetation dominated by eucalypts (*Eucalyptus* spp., *Corymbia* spp. or *Angophora* spp.) trees ……..…….. **Table B**

3. Vegetation dominated by trees or tall shrubs (>2m tall), that are not eucalypts (*Eucalyptus* spp., *Corymbia* spp. or *Angophora* spp.) or rainforest species ……..…… **Table C**

4. Vegetation not dominated by trees or tall shrubs (>2m tall) ……..**Table D**

A. Vegetation with a closed canopy dominated by rainforest# trees (>2m tall)

Canopy leaf size	Structure/ landscape situation	BVG
Acacia spp. frequent in the closed canopy	Frequently in disturbed situations (T7, T12a-d)	5d
Eucalypts frequent in the closed canopy	Mixed forests with rainforest understories and *Eucalyptus* spp. or *Corymbia torelliana* emergents (T13a-f)	8a, 9d
Mesophyll & notophyll leaves most frequent	Complex evergreen mesophyll vine forests usually in fertile and very wet locations (T1a)	1a
	Complex evergreen mesophyll to notophyll vine forest on basalt uplands (T1b)	1b
	Semi-deciduous mesophyll vine forest on metamorphics LZ11 (T4 granites and basalts)	2d
	Simple to complex, semi-deciduous mesophyll to notophyll vine forests, usually on infertile substrates (granites) (T2a)	2b
	Evergreen mesophyll to notophyll vine forest, frequently with conspicuous palms, in alluvial and moist situations (T3c,3b)	4a^
	Evergreen to semi-deciduous mesophyll to notophyll vine forest along streamlines (T1c)	4b^
Notophyll & microphyll leaves most frequent	Complex evergreen notophyll vine forest on ranges of fertile and infertile substrates, conspicuous *Argyrodendron* species CQC	5b
	Complex sometimes simple, evergreen notophyll vine forest frequently with *Araucaria* spp. (T5a,5b)	2a
	Simple to complex evergreen notophyll vine forest frequently with *Agathis robusta* emergents (T6)	5c
	Simple evergreen notophyll vine forest on beach ridges and coastal dunes (T2b)	3a
	Simple evergreen notophyll vine forest generally with *Welchiodendron longivalve* on LZ 5 & 10 northern CYP	2c
	Evergreen notophyll to microphyll vine forest frequently with *Araucaria* and low abundance of *Argyrodendron* spp. SEQ	5a
	Simple evergreen notophyll to microphyll vine forest usually at high altitudes (T8)	6a, 6b
Microphyll & nanophyll leaves most frequent	Evergreen microphyll vine –fern forest/ thicket (T9,10)	6a, 6b
	Semi-evergreen to deciduous microphyll vine thickets (T11)	7a, 7b

Equivalent Tracey (1982) Wet Tropics rainforest types are listed in the appropriate rainforest BVG, e.g. T9, 10.
Rainforest plants, see Glossary (Appendix 3) for definition. ^ Includes REs classified as wetlands, see Appendix 2
Coastal bioregions = All of CQC, CYP, SEQ, WET; and subregions 1, 2, 12 and 14 of BRB; and subregions 1 and 10 of the GUP. **Inland bioregions** = Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

B. Vegetation dominated by eucalypt (*Eucalyptus* spp., *Corymbia* spp. or *Angophora* spp.) trees

Structure	Mesic situation	Landscape situation	Predominant geology	Dominant/ diagnostic species (BVG)
Tall open forest	Moist	Lowland & ranges	Alluvia & mixed	*E. grandis* (8a)
			Sandstone & Basalt	*E. pilularis* (8b)
Open forests and woodlands	Moist	Coastal lowland & ranges	Metamorphics	*C. citriodora* (9a)
			Various	*E. platyphylla* (9b)
			Various	*C. clarksoniana* (9c)
			Coastal ranges	*E. portuensis* (9d)
			Coastal sandplains	*C. clarksoniana* (9e)
			Coastal dunes	*C. tessellaris* (9f)
			Tertiary surfaces	*E. tindaliae* (9g)
	Dry		Undulating to hilly	*E. acmenoides* (9h)
			Various	*C. citriodora* (10a)
	Moist			*C. citriodora* (10b)
		Uplands	Basalt	*E. orgadophila* (11a)
			Basalt	*E. tereticornis* (11b)
			Basalt	*E. leptophleba* (11c)
	Dry	Hills & ranges	Sandstones	*E. decorticans* (12a)
			Basalt	*E. crebra* (12b)
			Metamorphic / granite	*E. cullenii* (13a)
			Metamorphic / granite	*E. microneura* (13b)
			Metamorphic / granite	*E. crebra* (13c)
			Mixed	*E. moluccana* (13d)
		Undulating	Low plateaus & remnants	*E. tetrodonta* (14a)
			Erosional surfaces	*E. tetrodonta* (14b)
			Various	*C. nesophila* (14c)
		Ranges	Various geology	*C. stockeri* (14d)
			Traprock NET	*E. youmanii* (15a)
			Alluvial plains NET	*E. conica* (15b) ^
		Drainage lines & plains	Drainage lines	*E. camaldulensis* (16a) ^
			Levees	*E. leptophleba* (16b)
			Floodplains	*E. coolabah* (16c) ^
		Alluvia & alluvial sandplains		*E. populnea* (17a)
			Duplex soils	*E. melanophloia* (17b)
			Sand sheets	*E. whitei / E. similis* (17c)
			Duplex soils	*Corymbia spp.* (18a)
			Flat to undulating	*E. crebra* (18b)
			Flat to undulating	*E. chlorophylla* (18c)
				E. microneura (18d)
Low open woodlands	Dry	Hills & ranges	Various	*E. leucophloia* (19a)
		Valleys & footslopes	Various	*E. leucophylla* (19b) ^
		Sandplains		*E. pruinosa* (19c)
		Hills & ranges	Various	*E. persistens* (19d)

Coastal bioregions = All of CQC, CYP, SEQ, WET; and subregions 1, 2, 12 and 14 of BRB; and subregions 1 and 10 of the GUP.

Inland bioregions = Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

^ Includes regional ecosystems classified as wetlands, see Appendix 2

C. Vegetation dominated by trees or tall shrubs (>2m tall), that are not eucalypts (*Eucalyptus* spp., *Corymbia* spp. or *Angophora* spp.) or rainforest# species

Dominant structure/genera	Dominant Species	Land zone/ species/ bioregion	BVG
Mangroves	(adaptations for tidal zone)		35a^
Fringing trees around lakes / swamps/ billabongs	usually *Melaleuca* spp. or eucalypts		34d^
Callitris spp. woodlands / open forests			20
Acacia spp. woodlands / open forests	SOFT MULGA *Acacia aneura*	Deep kandosols and tenosols on plains and sandplains	23a
	HARD MULGA *Acacia aneura*	Shallow kandosols and rudosols	23b
	BRIGALOW *Acacia harpophylla*		25a
	GIDGEE *Acacia cambagei* or *A. georginae* or *A. argyrodendron*		26a^
	Acacia species on coastal dunes and beach ridges	Northern coastal bioregions	28b
	Other *Acacia* species in inland regions	Inland bioregions	24a
Melaleuca spp. woodlands / low open woodlands	*Melaleuca viridiflora*	Primarily depositional plains	21a
	M. stenostachya, M. citrolens	Primarily depositional plains	21b
	Mainly *Melaleuca* species other than those above	Seasonal coastal swamps & drainage lines	22a-c^
Lophostemon spp. or *Syncarpia glomulifera*	*Lophostemon* spp. or *Syncarpia glomulifera*	Coastal bioregions on rocky ranges	28e
Neofabricia or *Acacia* spp./ *Asteromyrtus brassii/*	*Neofabricia or Acacia spp./ Asteromyrtus brassii/ Allocasuarina littoralis/* and/or *Thryptomene oligandra*.	Low open forests in coastal CYP bioregion	28a,b,c
Lysiphyllum spp./ *Atalaya hemiglauca/ Grevillea striata*	*Lysiphyllum* spp./ *Atalaya hemiglauca/ Grevillea striata* and *Acacia* or *Terminalia* spp. or *Ventilago viminalis*	Low open woodlands in inland bioregions	27a,b,c

^ Includes regional ecosystems classified as wetlands, see Appendix 2
# Rainforest plants, see Glossary (Appendix 3) for definition.

Acacia spp. dominated groups may include communities dominated by ecologically allied taxa e.g. wooded downs dominated by *Ventilago viminalis,* etc. in the MGD bioregion.

Melaleuca spp. dominated groups may include communities dominated by ecologically allied taxa e.g. *Lysiphyllum* spp., *Atalaya hemiglauca* in the GUP bioregion.

Coastal bioregions = All of CQC, CYP, SEQ, WET; and subregions 1, 2, 12 and 14 of BRB; and subregions 1 and 10 of the GUP.
Inland bioregions = Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

D. Vegetation not dominated by trees or tall shrubs (>2m tall)

Life forms of ecologically dominant layer	Structure /genera	BVG
Devoid of terrestrial vegetation	Open water, lakes, billabongs	34a,d^
	Rock pavements on ranges	29b
	Saltpans and tidal flats	35b^
	River beds	16d^
	Sand blows	28d
Vegetation dominated by graminoids and/ or forbs	Tussock grasslands dominated by *Astrebla* or *Dichanthium* spp.	30a,b
	Open forblands to open tussock grassland of inland bioregions, not dominated by *Astrebla* species	31a,b
	Closed tussock grasslands of coastal and sub coastal areas	32a,b
	Hummock grasslands dominated by *Triodia basedowii* or *Zygochloa paradoxa*	33a
	Hummock grasslands dominated by *Triodia pungens*, *T. longiceps* or *T. mitchellii*	33b
	Herblands on sand or coral cays and sand blows	28d
	Sparse tidal saltpans	35b^
	Dominated by hydrophytes, e.g. sedges. Freshwater wetlands, springs and soaks	34c,e,f^
Dominated by shrubs (predominantly <2m tall)	Dominated by hydrophytes, e.g. *Duma florulenta*. Freshwater swamps, inland claypans	34b^
	Dominated by *Acacia* spp. (24a)	24a
	Dominated by *Senna* spp. (24b)	24b
	Dominated by myrtaceous shrubs - coastal heathlands	29a
	Dominated by myrtaceous shrubs - montane heathlands and shrublands	29b

^ Includes regional ecosystems classified as wetlands, see Appendix 2
# Rainforest plants, see Glossary (Appendix 3) for definition.

Coastal bioregions = All of CQC, CYP, SEQ, WET; and subregions 1, 2,12 and 14 of BRB; and subregions 1 and 10 of the GUP
Inland bioregions = Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

Appendix 2 Key to Wetland Broad Vegetation Groups

1. Attributes used in classifying BVGs containing extensive wetlands (BVG 4, 15b, 16, 19b, 22, 26a, 29a, 34 & 35)

BVG	Class	Water salinity	Landscape situation	Dominant/ diagnostic species
4a	Palustrine	Fresh	Streamlines and banks	Palm & rainforest species
4b	Riverine or fringing	Fresh	Streamlines and banks	Palm & rainforest species
15b	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Eucalyptus* spp.
16a	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Eucalyptus* spp.
16c	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Eucalyptus* spp.
16d	Palustrine	Fresh	Waterholes in broad sandy streams	Open water
19b	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Eucalyptus* spp.
22a	Palustrine	Fresh to brackish	Coastal seasonally inundated swamps	*Melaleuca quinquenervia*
22b	Palustrine	Fresh to brackish	Seasonally inundated swamps	A variety of *Melaleuca* spp.
22c	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Melaleuca* spp.
26a	Riverine or fringing	Fresh	Streamlines and banks	A variety of *Acacia* spp.
29a	Palustrine	Fresh	Depressions and flooded areas	Wet heath species
34a	Lacustrine	Fresh to saline	Freshwater lakes or large terminal saline lakes in arid areas	Open water or ephemeral herbs
34b	Palustrine	Saline	Non-floodplain swamps and claypans	Chenopods or herbs
34c	Palustrine	Fresh	Coastal floodplains	Sedges and rushes
34d	Palustrine	Fresh	Permanent or semi-permanent billabongs and swamps on floodplains	Open water, aquatics or ephemeral herbs
34e	Palustrine	Fresh to saline	Discharge or recharge springs on plains or hilly intake areas	Herbs
34f	Palustrine	Fresh	Seeps and soaks on peaks and non-floodplains	Herbs &/or shrubs
34g	Palustrine	Fresh to brackish	Floodplain swamps and claypans	*Chenopodium auricomum, Duma florulenta*
35a	Estuarine	Saline	Muddy shores	Mangroves
35b	Estuarine	Saline	Mud flats and saltpans	Bare areas or *Tecticornia* spp. or saline grasses

Small areas of riverine or fringing riverine wetland Regional Ecosystems occur in BVGs 8a, 9c, 9d, 9e, 21b and 28e.

For details on the Queensland wetland mapping and classification refer to Environmental Protection Agency (2005)

Appendix 3 Glossary

biodiversity status is based on an assessment of the condition of remnant vegetation in addition to the criteria used to determine the class under the *Vegetation Management Act 1999*

bioregion (biogeographical region) “an area of land that comprises broad landscape patterns that reflect major structural geologies and climate, as well as major floristic and faunal assemblages (from Sattler and Williams 1999)”

canopy is the stratum (or layer) formed collectively by the crowns of adjacent trees or shrubs. It may be continuous or discontinuous. The canopy refers to the predominant stratum. This definition is more specific that that used by Beadle and Costin (1952) who include the cover for the community as a whole (i.e. across all tree layers) as well as one of its component layers

canopy cover is the cover, measured as crown cover or projective foliage cover, of the canopy. Dense >80%; mid-dense 80-50%; sparse 50-20%; very sparse <20% canopy cover.

coastal bioregions All of CQC, CYP, SEQ, WET; and subregions 1, 2, 12 and 14 of BRB; and subregions 1 and 10 of the GUP

codominant species where two or more species contribute more or less equally to form the dominant above-ground biomass of a particular stratum

crown cover (%) *sensu* Walker and Hopkins (1990) is the percentage of the ground surface covered by the vertical projection of the periphery of plant crowns. Crowns are treated as opaque meaning that small gaps within the crown are ignored. Crown cover (%) of a stratum is measured for the stratum as a whole i.e. ignoring crown overlaps within a stratum.

dry refers to most areas of Queensland where the median annual rainfall is less than 1200 mm. Moist is primarily used in the broad vegetation group classification as a qualifier for Eucalypt dominated communities. See also moist.

dominant species (= predominant species) a species that contributes most to the overall above-ground biomass of a particular stratum

dominant layer or species is the layer or species making the greatest contribution to the overall biomass of the site and the vegetation community. Equivalent to the predominant layer or species

ecologically dominant layer (EDL) or stratum is the dominant canopy contributing most to the above-ground biomass

emergent layer/stratum the tallest layer/stratum is regarded as the emergent layer if it does not form the most above-ground biomass, regardless of its canopy cover, e.g. *Eucalyptus populnea* trees above a low woodland of mulga

foliage projective cover (FPC) is recorded as the percentage crown cover, or crown separation ratio or crown cover (i.e. the spacing; the density of vegetation)

grass any plant of the family Gramineae or Poaceae, characterised by jointed stems, sheathing leaves, flower spikelets, and fruit consisting of a seed-like grain or caryopsis (true grasses)

inland bioregions Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

land zone land zones represent major differences in geology and in the associated landforms, soils, and physical processes that give rise to distinctive landforms or continue to shape them. The twelve land zones in Queensland are defined in Wilson and Taylor (2012) and listed on the Queensland Government web site.

layer in a vegetation community produced by the occurrence at approximately the same level (height) of an aggregation of plants of the same habit (Beadle and Costin 1952)

lifeform – refer to the table below

Lifeform	Description
Tree	Woody plant more than 2 m tall with a single stem or branches well above the base
Tree mallee*	Woody perennial plant usually of the genus *Eucalyptus*. Multi-stemmed with fewer than five trunks, of which at least three exceed 100 mm in diameter at breast height. Usually 8 m or more tall
Shrub	Woody plant, less than 8 m tall and multi-stemmed at the base (or within 200 mm from ground level), or if single-stemmed less than 2 m tall.
Mallee scrub*	Commonly less than 8 m tall, usually with five or more trunks, of which at least three of the largest do not exceed 100mm in diameter at breast height
Heath scrub	Shrub usually less than 2 m tall, commonly with ericoid leaves (nanophyll or smaller).
Chenopod scrub	Xenomorphic single or multi-stemmed halophyte exhibiting drought and salt tolerance
Succulent shrub	Shrubs from the Chenopodiaceae family with succulent leaves e.g. *Tecticornia* spp.
Tussock grass (bunched grass)	Forms discrete but open tussocks usually with distinct individual shoots, or if not forms a hummock. These are the common agricultural grasses. Differentiated from sedges by split leaf sheath, presence of ligule, leaf always flat, stem cross section circular, and evenly spaced internodes below inflorescence.
Hummock grass	Coarse xenomorphic grass with a mound-like form often dead in the middle belong to the genus *Triodia*.
Sod grass*	Grass of short to medium height forming compact tussocks in close at their base and uniting as a densely interfacing leaf canopy
Sedge	Herbaceous, usually perennial, erect plant generally with a tufted habit and of the families Cyperaceae and Restionaceae. Differentiated from grasses by non-split leaf sheath, usually no ligule, leaf not always flat, stem cross section circular, triangular of polygonal and extended internode below inflorescence.
Rush*	Herbaceous, usually perennial, erect plant. Rushes are grouped in the families: Juncaceae, Typhaceae, Restionaceae (lacking tufted habit) and the genus Lomandra.
Forb	Herbaceous or slightly woody, annual or sometimes perennial plant; not a grass.
Fern	Pteridophytes: Characterised by large and usually branched leaves (fronds), herbaceous to arborescent and terrestrial to aquatic: spores in sporangia on the leaves.
Moss	Small plant usually with a slender leaf bearing stem with no true vascular tissue.
Vine	Climbing, twining, winding or sprawling plant usually with a woody stem.
Herb	Herbaceous or slightly woody, annual or sometimes perennial plant (dicotyledon or monocotyledon). The term “herb” includes grasses, sedges, rushes and forbs.

*These lifeforms are rarely dominant and therefore do not have corresponding structural formations.

Source: after Walker and Hopkins (1990). Herb definition follows Hnatiuk *et al.* (2009)

lowland refers to non-mountainous/ non-range areas in the coastal bioregions.

low open woodland is a structural formation defined by the Specht (1970) where the tree canopy has a height range of 2 to 10 metres with a foliage projective cover (FPC) less than 10%.

mesophyll or microphyll refers to the leaf area and length, see table below

Leaf size category	Leaf area (mm²)	Approx. length of lanceolate leaf (mm)	Approx. length of cordate or peltate leaf (mm)
Macrophyll	>18,225	>250	>160
Mesophyll	4500–18,255	125–250	80–160
Notophyll	2025–4500	75–125	60–80
Microphyll	225–2025	25–75	20–60
Nanophyll	25–225	<25	<20

Source: Walker and Hopkins (1990, Table 20).

moist refers to areas in Queensland that generally do not experience long-term water deficits. These areas are predominantly near the eastern coast and nearby ranges and generally receive at less 1200mm of median annual rainfall. Moist is primarily used as a qualifier for Eucalypt dominated communities. See also dry.

notophyll refers to the leaf area and length, see table above

open forest is a structural formation defined by the Specht (1970) where the tree canopy has a height range of 10 to 30 metres with a projective foliage cover (PFC) of between 30 and 70%.

open woodland is a structural formation defined by the Specht (1970) where the tree canopy has a height range of 10 to 30 metres with a projective foliage cover (PFC) less than 10%.

pre-clearing extent of vegetation (or regional ecosystems) present before clearing

predominant species is a species that contributes most to the overall above-ground biomass of a particular stratum

predominant stratum (or layer) the stratum (or layer) that contains the greatest amount of above-ground vegetation biomass. This is also referred to as the ecologically dominant layer or stratum or the predominant canopy in woody ecosystems

rainforest follows the definition by Webb (1978) for rainforest in Australia. Rainforests typically occur as scattered patches of varying sizes and interspersed with sclerophyllous elements. The opacity, texture and colour of the closed canopy readily sets it apart from most other vegetation. Rainforest trees are closely spaced with the crowns arranged in one or more continuous storeys or strata, the uppermost of which forms the closed canopy, which may be even, uneven or very broken and in places descends to ground level. Rainforest is distinguished from other closed canopy forests by the prominence of characteristic life forms such as epiphytes, lianes, root and stem structures and by the absence of annual herbs on the forest floor. See Webb (1978) for definitions of terms used in this classification.

rainforest plant(s) refers to species are adapted to regenerating in the low-light conditions experienced under the closed canopy or in localised gaps caused by recurring disturbances which are part of the natural rainforest ecosystem (includes windthrow, landslip, flooding, lightning strike and endemic forest diseases), and are not dependent on fire for successful regeneration (Lynch and Neldner 2000).

REDD is the Regional Ecosystem Description Database (Queensland Herbarium 2017a) which contains the latest descriptions of regional ecosystems.

regional ecosystem (RE) One or more vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2017a) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems

remnant vegetation is vegetation, part of which forms the predominant canopy of the vegetation—

(a) covering more than 50% of the undisturbed predominant canopy; and
(b) averaging more than 70% of the vegetation's undisturbed height; and
(c) composed of species characteristic of the vegetation's undisturbed predominant canopy.

remnant vegetation cover the digital map (or hard-copy map) that shows the distribution of vegetation that is defined as remnant vegetation. A map showing remnant vegetation cover is the same as a 'remnant map' defined under the *Vegetation Management Act* 1999

semi-evergreen few or none of the species are truly deciduous and most of those that shed their leaves do so incompletely depending on the severity of the dry season

structural formation The structural class combined with the dominant life form of a vegetation community, e.g. open forest

structure The spatial arrangement of plants within a vegetation community (Beadle and Costin 1952)

subcanopy refers to the layer immediately below the ecological dominant layer.

subdominant species A species is considered to be subdominant when it contributes less biomass than the dominant species, but occurs as more than an isolated individual. As a general rule, the species must individually contribute more than an associated species i.e. more than 10% of the total biomass of the stratum in which it occurs.

tall open forest is a structural formation defined by the Specht (1970) where the tree canopy has a height > 30 metres with a projective foliage cover (PFC) of between 30 and 70%.

understorey any stratum below (i.e. lower height than) the predominant stratum. Used in the rainforest classification of Webb (1978).

vegetation The entirety of the plant cover at a point on the Earth's surface at a particular time. It is the spatial and temporal expression of the flora of an area, as expressed in plant assemblages (communities) which consist of individual species with varied lifeforms (Raunkiaer 1934). The present vegetation is a reflection not only of the site potential as determined by climatic, physiographic, edaphic and biotic factors (Webb *et al.* 1970; Gunn *et al.* 1988), but also the history of land use and disturbance. Irregular catastrophic events, e.g. intense fires, prolonged droughts and clearing, whether natural or human-induced, can be important factors determining the floristic composition and structure of present day vegetation (Mueller-Dombois and Ellenberg 1974; Neldner 1984)

vegetation community (equivalent to land type in Sattler and Williams 1999) is an area of vegetation which is relatively uniform with respect to structure and floristics. The basic unit in the vegetation community classification within the regional ecosystem classification is the plant association or sub-association. A number of vegetation communities may form a single regional ecosystem, and are usually distinguished by differences in dominant species composition, frequently in the shrub or ground layers and denoted by a letter following the regional ecosystem code (e.g. a, b, c)

***Vegetation Management Act* 1999** an Act about vegetation management, and for other purposes

vegetation map a map whose primary purpose is to show the geographical distribution of the various vegetation communities of a given area

woodland is a structural formation defined by the Specht (1970) where the tree canopy has a height range of 10 to 30 metres with a foliage projective cover (FPC) of between 10 and 30%.

Appendix 4 Broad Vegetation Groups making up Major Vegetation Groups

MVG^	Description	Components
1	Rainforests and vine thickets	1a, 1b, 2a, 2b, 2c, 2d, 3a, 4a, 4b,5a, 5b, 5c, 5d, 6a, 6b, 7a, 7b
2	Eucalypt tall open forests	8a, 8b
3	Eucalypt Open Forests	9a, 9c, 9d, 10b, 11a, 11b
4*	Eucalypt Low Open Forests	Do not occur in Queensland
5	Eucalypt Woodlands	9b, 9e, 9f, 9g, 9h, 10a, 11c, 12a, 12b, 13a, 13b, 13c, 13d, 14a, 14b, 14c, 14d, 15a, 15b, 16a#
6	Acacia Forests and Woodlands	23a#, 24a#, 25a
7	Callitris Forests and Woodlands	20a
8	Casuarina Forests and Woodlands	25a#
9	Melaleuca Forests and Woodlands	21a, 21b, 22a, 22b, 22c
10	Other Forests and Woodlands	27a, 27b, 27c
11	Eucalypt Open Woodlands	16a#, 16b, 16c, 17a, 17b, 17c, 18a, 18b, 18c, 18d, 19a, 19b, 19c, 19d
12	Tropical Eucalypt Woodlands/Grasslands	This should include 14a,14b,14c,and 14d but these have been assigned to MVG5 in DEWR (2007)
13	Acacia Open Woodlands	23b#, 24a#, 26a
14	Mallee Woodlands and Shrublands	Minor components of 18a and 19b
15*	Low Closed Forests and Tall Closed Shrublands	Do not occur in Queensland
16	Acacia Shrublands	23b#,26a#
17	Other Shrublands	24b, 28c, 29a#
18	Heathlands	29a#, 29b
19	Tussock Grasslands	30a, 30b, 31a, 31b, 32a, 32b
20	Hummock Grasslands	33a, 33b
21	Other Grasslands, Herblands, Sedgelands and Rushlands	28d, 34a, 34c, 34d, 34e, 34f
22	Chenopod Shrublands, Samphire Shrublands and Forblands	34b, 34g, 35b
23	Mangroves	35a

^ Major Vegetation Groups are described in Department of Environment and Water Resources (2007).

* MVGs 4 and 15 do not occur in Queensland

part of this BVG is included

Appendix 5 Nested Table of 1:5 Million, 1:2 Million and 1:1 Million Scale Broad Vegetation Groups

1:5 M 1-16	1:2 M 1-35	1:1 M 1a-35b	BVG DESCRIPTION
1			**RAINFORESTS, SCRUBS**
1	**1**	**1**	**Complex mesophyll to notophyll vine forests of the Wet Tropics bioregion.**
1	**1**	**1a**	Complex mesophyll to notophyll vine forests usually in fertile and very wet locations. (land zones 3, 8, 11, 12) (CYP, WET) (Tracey 1982 1a)
1	**1**	**1b**	Complex mesophyll to notophyll vine forests usually on basalt tablelands. (land zones 3, 8) (WET) (Tracey 1982 1b)
1	**2**	**2**	**Complex to simple, semi-deciduous mesophyll to notophyll vine forest, sometimes with *Araucaria cunninghamii* (hoop pine).**
1	**2**	**2a**	Complex evergreen notophyll vine forest frequently with *Araucaria cunninghamii* (hoop pine) from foothills to ranges. (land zones 8, 11, 12) (WET, SEQ, CQC, [BRB]) (Tracey 1982 5a, 5b)
1	**2**	**2b**	Semi-deciduous mesophyll to notophyll vine forest usually on granitic ranges. (land zone 12) (CYP)
1	**2**	**2c**	Semi-deciduous notophyll vine forest to simple evergreen notophyll vine forests, frequently with *Welchiodendron longivalve* on the Cape York Peninsula bioregion. (land zones 5, 12) (CYP)
1	**2**	**2d**	Semi-deciduous notophyll/mesophyll vine forest on coastal ranges. (land zones 8, 11, 12) (CYP, WET) (Tracey 1982 4 on basalt, metamorphics and granite)
1	**3**	**3**	**Notophyll vine forest/ thicket (sometimes with sclerophyll and/or Araucarian emergents) on coastal dunes and sand masses.**
1	**3**	**3a**	Evergreen to semi-deciduous, notophyll to microphyll vine forest/ thicket on beach ridges and coastal dunes, occasionally *Araucaria cunninghamii* (hoop pine) microphyll vine forest on dunes. *Pisonia grandis* on coral cays. (land zone 2) (CYP, GUP, SEQ, WET, BRB, CQC) (Tracey 1982 2b)
1	**4**	**4**	**Notophyll and mesophyll vine forest with feather or fan palms on alluvia, along streamlines and in swamps on ranges or within coastal sand masses.**
1	**4**	**4a**	Notophyll and mesophyll vine forest with feather or fan palms in alluvia and in swampy situations on ranges or within coastal sand masses. (land zones 3, 11, 12, 2) (SEQ, WET, CQC, CYP) (Tracey 1982 2b,3b, 3c)
1	**4**	**4b**	Evergreen to semi-deciduous mesophyll to notophyll vine forest, frequently with Archontophoenix spp. (palms) fringing streams.(land zones 3, [10]) (CYP, SEQ, WET, CQC, [GUP, BRB]) (Tracey 1982 1c)
1	**5**	**5**	**Notophyll to microphyll vine forests, frequently with *Araucaria* spp. or *Agathis* spp. (kauri pines)**
1	**5**	**5a**	Araucarian notophyll/microphyll and microphyll vine forests of southern coastal bioregions. (land zones 8, 11, 5, 9) (SEQ, [BRB])
1	**5**	**5b**	Notophyll to microphyll vine forests, frequently with Araucaria cunninghamii (hoop pine), on ranges of central coastal bioregions. (land zones 12, 11, 8) (CQC, [WET])
1	**5**	**5c**	Simple to complex notophyll vine forests, often with *Agathis* spp. on ranges and uplands of the Wet Tropics bioregion. (land zones 12, 11, 8) (WET, [EIU]) (Tracey 1982 6)
1	**5**	**5d**	*Acacia celsa* / *A. mangium* (brown salwood) / *A. polystachya* closed forests to open forests with mixed rainforest species understorey, includes areas regenerating after disturbance (upland and lowland areas). (land zones 12, 11, 3, 8)(CYP, WET)
1	**6**	**6**	**Notophyll vine forest and microphyll fern forest to thicket on high peaks and plateaus.**
1	**6**	**6a**	Notophyll vine forest and microphyll fern forest to thicket on high peaks and plateaus of southern Queensland. (land zone 8) (SEQ)

1	**6**	**6b**	Simple evergreen notophyll vine forest to simple microphyll vine fern thicket on high peaks and plateaus of northern Queensland. (land zones 12, 11) (WET, CQC, [BRB]) (Tracey 1982 8, 9, 10)
1	**7**	**7**	**Semi-evergreen to deciduous microphyll vine thicket.**
1	**7**	**7a**	Semi-evergreen vine thickets on wide range of substrates. (land zones 8, 9, 11, 12, 5, 9-10, 4, 3, 10) (BRB, EIU, SEQ, CQC) (Tracey 1982 11)
1	**7**	**7b**	Deciduous microphyll vine thicket on ranges and heavy clay alluvia in northern bioregions.(land zones 3, 12, 11, 10, 7) (CYP, [WET])
2			**WET EUCALYPT OPEN FORESTS**
2	**8**	**8**	**Wet eucalypt tall open forest on uplands and alluvia.**
2	**8**	**8a**	Wet tall open forest dominated by species such as *Eucalyptus grandis* (flooded gum) or *E. saligna, E. resinifera* (red mahogany), *Lophostemon confertus* (brush box), *Syncarpia* spp. (turpentine), *E. laevopinea* (silvertop stringybark). Contains a well developed understorey of rainforest components, including ferns and palms, or the understorey may be dominated by sclerophyll shrubs.(land zones 12, 8, 10, 11, 3, 9-10, 5, 2) (SEQ, WET, BRB, CQC, [NET, EIU])
2	**8**	**8b**	Moist open forests to tall open forests mostly dominated by *Eucalyptus pilularis* (blackbutt) on coastal sands, sub-coastal sandstones and basalt ranges. Also includes tall open forests dominated by *E. montivaga, E. obliqua* (messmate stringybark) and *E. campanulata* (New England ash). (land zones 12, 9, 11, 2, 5, 8) (SEQ, [CQC, BRB])
3			**EASTERN EUCALYPT WOODLANDS TO OPEN FORESTS**
3	**9**	**9**	**Moist to dry eucalypt open forests to woodlands usually on coastal lowlands and ranges.**
3	**9**	**9a**	Moist eucalypt open forests to woodlands dominated by a variety of species including *Eucalyptus siderophloia* (red ironbark), *E. propinqua* (small-fruited grey gum), *E. acmenoides* (narrow-leaved white stringybark), *E. microcorys* (tallowwood), *E. carnea* (broad-leaved white mahogany), *E. tindaliae* (Queensland white stringybark), *Corymbia intermedia* (pink bloodwood), *Lophostemon confertus* (brush box). (land zones 11, 12, 9-10, 5, [8]) (SEQ, [BRB])
3	**9**	**9b**	Moist to dry woodlands dominated by *Eucalyptus platyphylla* (poplar gum) and/or *E. leptophleba* (Molloy red box). Other frequent tree species include *Corymbia clarksoniana* (grey bloodwood), *E. drepanophylla* (grey ironbark) and occasionally *E. chlorophylla*. (land zones 12, 11, 3, 10, 5). (CYP, CQC, BRB, WET, EIU)
3	**9**	**9c**	Open forests of *Corymbia clarksoniana* (grey bloodwood) (or *C. intermedia* (pink bloodwood) or *C. novoguinensis*), *C. tessellaris* (carbeen) ± *Eucalyptus tereticornis* (blue gum) predominantly on coastal ranges. Other frequent tree species include *Eucalyptus drepanophylla* (grey ironbark), *E. pellita* (large-fruited red mahogany), *E. brassiana* (Cape York red gum) and *Lophostemon suaveolens* (swamp box). (land zones 12, 11, 5, 8). (WET, CQC, CYP, BRB, EIU, [SEQ])
3	**9**	**9d**	Moist to dry open forests to woodlands dominated by *Eucalyptus portuensis, Corymbia intermedia* (pink bloodwood), *E. drepanophylla, E. resinifera* or *E. reducta +/-Syncarpia glomulifera* (turpentine) or *E. cloeziana* (Gympie messmate) on ranges. Also includes mixed forests with *E. pellita* or *C. torelliana* (cadaghi) emergents and rainforest understories (land zones 12, 11, 3, 5, [10, 9, 8]). (WET, CQC, EIU, [CYP, BRB])
3	**9**	**9e**	Open forests, woodlands and open woodlands dominated by *Corymbia clarksoniana* (grey bloodwood) (or *C. novoguinensis* or *C. intermedia* (pink bloodwood) or *C. polycarpa* (long-fruited bloodwood)) frequently with *Erythrophleum chlorostachys* (red ironwood) or *Eucalyptus platyphylla* (poplar gum) predominantly on coastal sandplains and alluvia. (land zones 3, 5, 2) (BRB, CYP, CQC, WET, EIU)
3	**9**	**9f**	Woodlands dominated by *Corymbia* spp. e.g.: *C. intermedia* (pink bloodwood), *C. tessellaris* (Moreton Bay ash) and/or *Eucalyptus* spp. (*E. racemosa, E. tereticornis* (blue gum)), frequently with *Banksia* spp., *Acacia* spp. and C*allitris columellaris* (white cypress pine) on coastal dunes and beach ridges. (land zone 2) (SEQ)
3	**9**	**9g**	Moist to dry woodlands to open forest dominated by stringybarks or mahoganies such as *Eucalyptus tindaliae* (Queensland white stringybark), *E. latisinensis* (white mahogany), *E. acmenoides* (narrow-leaved white stringybark); or *E. racemosa* (scribbly gum) or *E. seeana* or *E. tereticornis* (blue gum) and *Corymbia intermedia* (pink bloodwood). (land zones 3, 5) (SEQ) (land zone 5, 12, 9-10, 2, 11, [8, 3]) (SEQ, [BRB])

3	**9**	**9h**	Dry woodlands dominated by species such as *Eucalyptus acmenoides* (narrow-leaved white stringybark) (or *E. portuensis*), *E. tereticornis* (blue gum), *Angophora leiocarpa* (rusty gum), *Corymbia trachyphloia* (yellow bloodwood) or *C. intermedia* (pink bloodwood), and often ironbarks including *E. crebra* (narrow-leaved red ironbark) or *E. fibrosa* (dusky-leaved ironbark). A heathy shrub layer is frequently present. On undulating to hilly terrain. (land zones 12, 9-10, 11, [8, 5]) (SEQ, BRB)
3	**10**	**10**	***Corymbia citriodora* (spotted gum) dominated open forests to woodlands on undulating to hilly terrain.**
3	**10**	**10a**	Dry woodlands to open woodlands dominated by *Corymbia citriodora* (spotted gum). (land zones 10, 7, 12, 11,[5, 3]) (BRB, [NET, DEU, WET, SEQ, EIU, CQC])
3	**10**	**10b**	Moist open forests to woodlands dominated by *Corymbia citriodora* (spotted gum). (land zones 12, 11, 9-10, 5, [8]) (SEQ, CQC, EIU, WET, [BRB])
3	**11**	**11**	**Moist to dry eucalypt open forests to woodlands mainly on basalt areas (land zone 8).**
3	**11**	**11a**	Moist to dry open forests to woodlands dominated by *Eucalyptus orgadophila* (mountain coolibah). Some areas dominated by *E. tereticornis* (blue gum), *E. melliodora* (yellow box), *E. albens* (white box), *E. crebra* (narrow-leaved red ironbark) or *E. melanophloia* (silver-leaved ironbark). (land zones 8, 11, 4, [12]) (BRB, SEQ, EIU, [GUP])
3	**11**	**11b**	Moist to dry open forests to woodlands dominated by *Eucalyptus crebra* (narrow-leaved red ironbark) or *E. tereticornis* (blue gum), frequently with *Corymbia* species or *E. microneura* (Gilbert River box) on red ferrosols on undulating terrain. (land zone 8) (EIU, [DEU, GUP])
3	**11**	**11c**	Moist woodlands dominated by *Eucalyptus leptophleba* (Molloy red box) ± *Corymbia papuana* (ghost gum) ± *C. tessellaris* (carbeen). (land zones 8, 11) (EIU, CYP)
3	**12**	**12**	**Dry eucalypt woodlands to open woodlands, mostly on shallow soils in hilly terrain (mainly on sandstone and weathered rocks, land zones 7 and 10).**
3	**12**	**12a**	Dry woodlands to open woodlands dominated by ironbarks such as *Eucalyptus decorticans* (gum-topped ironbark), *E. fibrosa* subsp. *nubila* (blue-leaved ironbark), or *E. crebra* (narrow-leaved red ironbark) and/or bloodwoods such as *Corymbia trachyphloia* (yellow bloodwood), *C. leichhardtii* (rustyjacket), *C. watsoniana* (Watson's yellow bloodwood), *C. lamprophylla, C. peltata* (yellowjacket). Occasionally *E. thozetiana* (mountain yapunyah), *E. cloeziana* (Gympie messmate) *or E. mediocris* are dominant. Mostly on sub-coastal/inland hills with shallow soils.(land zones 10, 7, 9-10, {12, 11, 5, 4, 9) (BRB, DEU, SEQ, GUP, [EIU])
3	**12**	**12b**	Woodlands and open woodlands dominated by *Eucalyptus crebra* (narrow-leaved red ironbark) and/or *Corymbia* spp. such as *C. clarksoniana* (grey bloodwood), *C. stockeri, C. setosa* (rough leaved bloodwood) or *C. peltata* (yellowjacket) on hilly terrain. (land zones 7, 10, 11) (GUP, EIU, DEU, [CYP, BRB])
3	**13**	**13**	**Dry to moist eucalypt woodlands and open forests, mainly on undulating to hilly terrain of mainly metamorphic and acid igneous rocks, Land zones 11 and 12).**
3	**13**	**13a**	Woodlands and open woodlands dominated by ironbarks such *Eucalyptus cullenii* (Cullen's ironbark), *E. staigeriana* (lemon-scented ironbark) or *E. melanophloia* (silver-leaved ironbark) and bloodwoods such as *Corymbia stockeri* subsp. *peninsularis, C. clarksoniana* (grey bloodwood) or *C. leichhardtii* (rustyjacket). (land zones 11, 12, 7, 5) (EIU, CYP, [GUP, BRB, WET])
3	**13**	**13b**	Woodlands to open woodlands dominated by *Eucalyptus microneura* (Gilbert River box) on shallow soils on rolling hills. (land zones 12, 11, 9) (EIU, GUP)
3	**13**	**13c**	Woodlands of *Eucalyptus crebra* (narrow-leaved red ironbark), *E. drepanophylla* (grey ironbark), *E. fibrosa* (dusky-leaved ironbark), *E. shirleyi* (Shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, 9-10, [5]) (BRB, EIU, SEQ, NET, [CQC, GUP, DEU])
3	**13**	**13d**	Woodlands dominated by *Eucalyptus moluccana* (gum-topped box) (or *E. microcarpa* (inland grey box)) on a range of substrates. (land zones 5, 3, 11, 9-10, 9, 12, [8]) (BRB, SEQ, EIU, [CQC, NET, WET])
3	**14**	**14**	**Woodlands and tall woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala*), and/or *Corymbia nesophila* (Melville Island bloodwood) and/or *E. phoenicea* (scarlet gum).**

3	**14**	**14a**	Woodlands and tall woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala*), with *Corymbia nesophila* (Melville Island bloodwood). Occasionally *E. chartaboma* (or *E. miniata* (Darwin woollybutt)), on deeply weathered plateaus and remnants. (land zones 5, [7, 10]). (CYP, GUP, [NWH])
3	**14**	**14b**	Woodlands dominated by *Eucalyptus tetrodonta* (Darwin stringybark) (or *E. megasepala* (Melville Island bloodwood)) or *E. chartaboma* (or *E. miniata* (Darwin woollybutt)), with *Corymbia clarksoniana* (grey bloodwood) on erosional surfaces, residual sands and occasionally alluvial plains. (land zones 5, 3, 7, [2, 10]) (CYP, GUP, [EIU, NWH, DEU])
3	**14**	**14c**	Open forests and woodlands dominated by *Corymbia nesophila* (Melville Island bloodwood) usually with *Eucalyptus tetrodonta* (Darwin stringybark) or *E. phoenicea* (scarlet gum). (land zones 11, 10, 5, 12, [3,2]) (CYP, WET, [EIU])
3	**14**	**14d**	Woodlands dominated by *Corymbia stockeri* (or *C. hylandii*) and *Eucalyptus megasepala* (or *E. tetrodonta* (Darwin stringybark)) on sandstone, metamorphic and ironstone ranges. (land zones 10, 11, 12, 7, [9]) (CYP, GUP, EIU, [DEU])
3	**15**	**15**	**Temperate eucalypt woodlands.**
3	**15**	**15a**	Woodlands and open forests dominated by *Eucalyptus youmanii* (Youman's stringybark), *E. scoparia* (Wallangarra white gum), *E. caliginosa* (broad-leaved stringybark) or *E. melliodora* (yellow box) occurring on traprock. (land zones 11, 12, 9) (NET, BRB)
3	**15**	**15b**	Woodlands dominated by *Eucalyptus conica* (fuzzy box) or *E. nova-anglica* (New England peppermint) or *E. blakelyi* (Blakely's red gum) on alluvial plains. (land zone 3) (BRB, NET)
4			**EUCALYPT OPEN FORESTS TO WOODLANDS ON FLOODPLAINS**
4	**16**	**16**	***Eucalyptus* spp. dominated open forest and woodlands drainage lines and alluvial plains.**
4	**16**	**16a**	Open forest and woodlands dominated by *Eucalyptus camaldulensis* (river red gum) (or *E. tereticornis* (blue gum)) and/or *E. coolabah* (coolabah) (or *E. microtheca* (coolabah)) fringing drainage lines. Associated species may include *Melaleuca* spp., *Corymbia tessellaris* (carbeen), *Angophora* spp., *Casuarina cunninghamiana* (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, NWH, EIU, SEQ, [NET, WET])
4	**16**	**16b**	Woodlands dominated by *Eucalyptus leptophleba* (Molloy red box), with *Corymbia tessellaris* (carbeen) or *C. clarksoniana* (grey bloodwood) or *C. dallachiana;* or dominated by *Corymbia terminalis* (desert bloodwood) or other *Corymbia* in the Gulf Plains and Northwest Highlands bioregions. On sandy levees. (land zones 3,5) (CYP, EIU, GUP, NWH, [MGD])
4	**16**	**16c**	Woodlands and open woodlands dominated by *Eucalyptus coolabah* (coolabah) or *E. microtheca (*coolabah) or *E. largiflorens* (black box) or *E. tereticornis* (blue gum) or *E. chlorophylla* on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (GUP, BRB, MUL, SEQ, CHC, CYP, [EIU, MGD, NWH, NET, DEU]).
4	**16**	**16d**	River beds, open water or sand, or rock, frequently unvegetated. (land zone 3) (GUP, EIU, BRB, CYP, WET, SEQ, DEU, [CQC, MUL, NWH, MGD])
5			**EUCALYPT DRY WOODLANDS ON INLAND DEPOSITIONAL PLAINS**
5	**17**	**17**	***Eucalyptus populnea* (poplar box) or *E. melanophloia* (silver-leaved ironbark) (or *E. whitei* (White's ironbark)) dry woodlands to open woodlands on sandplains or depositional plains.**
5	**17**	**17a**	Woodlands dominated by *Eucalyptus populnea* (poplar box) (or *E. brownii* (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges. (land zones 3, 5, 10, 9, 4, 11, 12, [8]) (BRB, MUL, DEU, [EIU, SEQ, MGD, GUP, NET])
5	**17**	**17b**	Woodlands to open woodlands dominated by *Eucalyptus melanophloia* (silver-leaved ironbark) (or *E. shirleyi* (Shirley's silver-leaved ironbark)) on sand plains and footslopes of hills and ranges. (land zones 5, 12, 3, 11, 9, 7) (BRB, DEU, EIU, SEQ, NET, GUP, [NWH, MUL])
5	**17**	**17c**	*Eucalyptus whitei* (White's ironbark) or *E. similis* (Queensland yellowjacket) on sand sheets.(land zones 5, 7, 3, [10]) (DEU, GUP, EIU, MGD, BRB])

5	**18**	**18**	**Dry eucalypt woodlands to open woodlands primarily on sandplains or depositional plains.**
5	**18**	**18a**	Dry woodlands to open woodlands, dominated by bloodwoods (*Corymbia dallachiana, C. terminalis* (western bloodwood), *C. plena,* or *C. leichhardtii* (rustyjacket)) or ironbarks (*Eucalyptus quadricostata* (Pentland ironbark), *E. crebra* (narrow-leaved red ironbark) or *E. exilipes* (fine-leaved ironbark)), often with *E. acmenoides* (narrow-leaved white stringybark), A*ngophora leiocarpa* (rusty gum) and *Callitris glaucophylla* (white cypress pine) in the Brigalow Belt, on sandy plateaus and plains. (land zones 5, 3, 7) (GUP, DEU, BRB, [EIU, NWH, MGD])
5	**18**	**18b**	Woodlands dominated *Eucalyptus crebra* (narrow-leaved red ironbark) frequently with *Corymbia* spp. or *Callitris* spp. on flat to undulating plains. (land zones 5, 3) (BRB, DEU, EIU, [SEQ, GUP, CQC, NET])
5	**18**	**18c**	Woodlands and open woodlands dominated by *Eucalyptus chlorophylla* (*E. microtheca* or *E. leptophleba* on heavy soils) frequently with *Corymbia* spp.; or dominated by *E. tectifica* west of Burketown (land zones 9, 5, 4, 3, [12) (CYP, GUP, EIU, MGD, NWH)
5	**18**	**18d**	Woodlands to low open woodlands dominated by *Eucalyptus microneura* (Gilbert River box) sometimes with *Corymbia* spp. (land zones 5, 10, 3, [12]) (GUP, EIU)
6			**EUCALYPT LOW OPEN WOODLANDS USUALLY WITH SPINIFEX UNDERSTOREY**
6	**19**	**19**	***Eucalyptus* spp. (*E. leucophloia* (snappy gum), *E. leucophylla* (Cloncurry box), *E. persistens, E. normantonensis* (Normanton box)) low open woodlands often with *Triodia* spp. dominated ground layer.**
6	**19**	**19a**	Low open woodlands dominated by *Eucalyptus leucophloia* (snappy gum) with *Triodia* spp. dominated ground layer, mainly on hills and ranges. (land zones 7, 11, 5, 12, [10, 9]) (NWH, GUP, MGD)
6	**19**	**19b**	Low open woodlands dominated by *Eucalyptus leucophylla* (Cloncurry box) or less extensively *Corymbia terminalis* (western bloodwood) low open woodlands and related associations, mainly lower slopes and valleys. (land zones 5, 11, 9, 12, 3, [7]) (NWH, MGD, GUP, CHC)
6	**19**	**19c**	Low open woodlands dominated by *Eucalyptus pruinosa* low open woodlands on sandplains, outwash areas and lateristised surfaces. (land zones 5, 7, 3, 11) (GUP, NWH, [MGD])
6	**19**	**19d**	Low open woodlands dominated by *Eucalyptus persistens* (or *E. normantonensis* (Normanton box), *E. tardecidens*) with *Triodia* spp. dominated ground layer, mainly on hills and ranges. (land zones 7, 11, 12, 5, [4, 10]) (EIU, CHC, BRB, GUP, DEU, MGD, [MUL, NWH, CYP])
7			***CALLITRIS* WOODLAND - OPEN FORESTS**
7	**20**	**20**	***Callitris glaucophylla* (white cypress pine) or *C. intratropica* northern cypress pine) woodlands to open forests (land zones 3, 5, 10, 12) (BRB, DEU, EIU, MUL)**
7	**20**	**20a**	Woodlands to open forests dominated by *Callitris glaucophylla* (white cypress pine) or *C. intratropica* (northern cypress pine) (land zones 10, 3, 12, 5) (BRB, MUL, EIU, [GUP, DEU])
8			***MELALEUCA* OPEN WOODLANDS ON DEPOSITIONAL PLAINS**
8	**21**	**21**	***Melaleuca* spp. dry woodlands to open woodlands on sandplains *or* depositional plains.**
8	**21**	**21a**	Low woodlands and low open woodlands dominated by *Melaleuca viridiflora* (coarse-leaved paperbark) on depositional plains. (land zones 3, 5, [11, 7,12,2]) (GUP, CYP, [BRB, CQC, EIU, WET, SEQ, DEU, NWH])
8	**21**	**21b**	Low open woodlands and tall shrublands of *Melaleuca stenostachya* or *M. citrolens* or other *Melaleuca* spp. (land zones 5, 3, 7, 10, 11, [12, 9, 8]) (GUP, CYP, EIU, [DEU, BRB, SEQ, NWH])
8	**22**	**22**	***Melaleuca* spp. on seasonally inundated open forests and woodlands of lowland coastal swamps and fringing drainage lines. (palustrine wetlands).**
8	**22**	**22a**	Open forests and woodlands dominated by *Melaleuca quinquenervia* (swamp paperbark) in seasonally inundated lowland coastal areas and swamps. (land zones 3, 2, [1, 11, 12]) (SEQ, WET, [CQC, CYP, BRB])

8	**22**	**22b**	Open forests and low open forests dominated by *Melaleuca* spp. (*M. saligna, M. leucadendra* (broad-leaved tea-tree), *M. clarksonii* or *M. arcana* (winti) in seasonally inundated swamps. (land zones 3, 2, [1]) (CYP, GUP, CQC, WET, [BRB, DEU])
8	**22**	**22c**	Open forests dominated by *Melaleuca* spp. (*M. argentea* (silver tea-tree)*, M. leucadendra* (broad-leaved tea-tree)*, M. dealbata* (swamp tea-tree) or *M. fluviatilis*), fringing major streams with *Melaleuca saligna* or *M. bracteata* (black tea-tree) in minor streams. (land zone 3) (CYP, GUP, EIU, BRB, CQC, DEU, WET, [NWH, SEQ])
9			***ACACIA ANEURA* (mulga) DOMINATED OPEN-FORESTS, WOODLANDS AND SHRUBLANDS**
9	**23**	**23**	***Acacia aneura* (mulga) dominated associations on red earth plains, sandplains or residuals.**
9	**23**	**23a**	Woodlands to low woodlands dominated by *Acacia aneura* on red earth plains or sandplains (soft mulga). (land zones 5, 6, 3) (MUL, CHC, MGD, BRB [NWH])
9	**23**	**23b**	Tall shrublands to low open woodlands dominated by *Acacia aneura* on shallow red earth plains (hard mulga). (land zones 7, 5) (MUL, CHC, MGD, [DEU, BRB, NWH])
10			**OTHER ACACIA DOMINATED OPEN-FORESTS, WOODLANDS AND SHRUBLANDS**
10	**24**	**24**	***Acacia* spp. on residuals. Species include *A. clivicola, A. sibirica, A. shirleyi* (lancewood), *A. microsperma* (bowyakka), *A. catenulata* (bendee), *Acacia rhodoxylon* (ringy rosewood).**
10	**24**	**24a**	Low woodlands to tall shrublands dominated by *Acacia* spp. on residuals. Species include *A. shirleyi* (lancewood), *A. catenulata* (bendee), *A. microsperma* (bowyakka), *A. clivicola, A. sibirica, A. rhodoxylon* (rosewood) and *A. leptostachya* (Townsville wattle). (land zones 5, 7, 10, 11, 12) (BRB, CHC, CYP, DEU, EIU, GUP, MUL, MGD, NWH)
10	**24**	**24b**	Open shrublands dominated by *Senna* spp. on calcareous residuals.Open shrublands dominated by Senna spp. on calcareous residuals. (land zones 9, [7}) (MGD, CHC, NWH)
10	**25**	**25**	***Acacia harpophylla* (brigalow) sometimes with *Casuarina cristata* (belah) open forests to woodlands on heavy clay soils.**
10	**25**	**25a**	Open forests to woodlands dominated by *Acacia harpophylla* (brigalow) sometimes with *Casuarina cristata* (belah) on heavy clay soils. Includes areas co-dominated with *A. cambagei* (gidgee) and/or emergent eucalypts (land zones 4, 9, 3, 11, 7, [12, 9-10,5, 8]) (BRB, MUL, MGD, DEU, [SEQ])
10	**26**	**26**	***Acacia cambagei* (gidgee) / *A. georginae* (Georgina gidgee) / *A. argyrodendron* (blackwood) dominated associations.**
10	**26**	**26a**	Open forests to tall shrublands dominated by *Acacia cambagei* (gidgee) or *A. georginae* (Georgina gidgee) or *A. argyrodendron* (blackwood). (land zones 9, 3, 4, 6, 5, 7, [8]) (MGD, CHC, MUL, BRB, DEU, GUP, NWH, [EIU])
11			**MIXED SPECIES WOODLANDS - OPEN WOODLANDS (INLAND BIOREGIONS) includes WOODED DOWNS**
11	**27**	**27**	**Mixed species woodlands - open woodlands (*Atalaya hemiglauca* (whitewood), *Lysiphyllum* spp., *Acacia tephrina* (boree), wooded downs.**
11	**27**	**27a**	Low open woodlands dominated by a variety of species including *Acacia tephrina* (boree), *Atalaya hemiglauca* (whitewood), *Archidendropsis basaltica* (eastern dead finish), *Ventilago viminalis* (supplejack) and *Lysiphyllum* spp. (land zones 9, 3, 4, [5]) (MGD, GUP, [BRB, DEU, EIU, CHC, CYP])
11	**27**	**27b**	Low woodlands of a variety of species including *Lysiphyllum cunninghamii, Grevillea striata* (beefwood) *Atalaya hemiglauca* (whitewood) occurring on sandplains. (Bylong landsystem) (land zones 5, 9, [3]) (GUP, NWH, MGD)
11	**27**	**27c**	Low open woodlands dominated by a variety of species including *Grevillea striata* (beefwood), *Acacia* spp., *Terminalia* spp. or *Cochlospermum* spp. (land zones 9, 12, 3, 11, 5) (NWH, EIU, DEU, GUP, [BRB, MGD])
12			**OTHER COASTAL COMMUNITIES OR HEATHS**

12	**28**	**28**	**Open forests to open woodlands in coastal locations. Dominant species such as *Casuarina* spp., *Corymbia* spp., *Allocasuarina* spp. (she-oak), *Acacia* spp., *Lophostemon suaveolens* (swamp box), *Asteromyrtus* spp., *Neofabricia myrtifolia.***
12	**28**	**28a**	Complex of open shrubland to closed shrubland, grassland, low woodland and open forest, on strand and foredunes. Includes pure stands of *Casuarina equisetifolia* (coastal sheoak). (land zones 2,1) (land zones 2, 1) (GUP, SEQ, [BRB, CYP, WET, CQC])
12	**28**	**28b**	Open forest to woodland dominated by *Acacia crassicarpa* (brown salwood) or other *Acacia* spp. with *Syzygium* spp., *Corymbia* spp. and/or *Parinari nonda* (parinari). (land zones 2, [3]) (CYP, BRB, CQC, [WET])
12	**28**	**28c**	Low open forest dominated by *Asteromyrtus brassii, Neofabricia myrtifolia, Allocasuarina littoralis* (woolly oak), *Melaleuca viridiflora* (coarse-leaved paperbark) on sandplains and plateaus; or *Acacia brassii* low open forest or *Melaleuca viridiflora* low woodlands on ranges; or *Thryptomene oligandra* ± *Neofabricia mjoebergii* ± *Melaleuca viridiflora* woodlands on drainage depressions. (land zones 3, 5, 12, [2, 11, 10]) (CYP, [GUP])
12	**28**	**28d**	Sand blows to closed herblands of *Lepturus repens* (stalky grass) and herbs on sand cays and shingle cays. (land zone 2) (CYP, SEQ, [CQC])
12	**28**	**28e**	Low open forest to woodlands dominated by *Lophostemon suaveolens* (swamp box) (or *L. confertus* (brush box)) or *Syncarpia glomulifera* (turpentine) frequently with *Allocasuarina* spp. on rocky hill slopes. (land zones 12, 3, 9-10, 11, [10, 8, 5]) (CQC, WET, SEQ, BRB, [CYP])
12	**29**	**29**	**Heathlands and associated scrubs and shrublands on coastal dunefields and inland/ elevated locations.**
12	**29**	**29a**	Open heaths and dwarf open heaths on coastal dunefields, sandplains and headlands. (land zones 2, 3, 5, 11, 12) (CYP, SEQ, [WET, BRB])
12	**29**	**29b**	Open shrublands to open heaths on elevated rocky locations. (land zones 7, 12, 11, 5, 8, 10) (BRB, EIU, WET, CYP, GUP, DEU, SEQ, NET, [CQC, NWH])
13			**TUSSOCK GRASSLANDS, FORBLANDS**
13	**30**	**30**	***Astrebla* spp. (Mitchell grass), *Dichanthium* spp. (bluegrass) tussock grasslands.**
13	**30**	**30a**	Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Eulalia aurea* (silky browntop) on alluvia. (land zones 3, [4]) (MGD, GUP, BRB, MUL, [NWH, DEU, CHC, EIU])
13	**30**	**30b**	Tussock grasslands dominated by *Astrebla* spp. (Mitchell grass) or *Dichanthium* spp. (bluegrass) often with *Iseilema* spp. on undulating downs or clay plains.(land zones 9, 4, 8, [3, 5, 11]) (MGD, CHC, GUP, BRB, [EIU, NWH, DEU])
13	**31**	**31**	**Mixed open forblands to open tussock grasslands in inland locations**
13	**31**	**31a**	Open forblands to open tussock grasslands which may be composed of *Atriplex* spp. (saltbush), *Sclerolaena* spp. (burr), *Asteraceae* spp. and/or short grasses on alluvial plains. (land zones 3, [5]) (CHC, MGD, MUL, GUP, [BRB, NWH, DEU])
13	**31**	**31b**	Short grass / forb associations on stony downs.(land zones 9, 7, [5]) (CHC, DEU, [MGD, NWH, GUP])
13	**32**	**32**	**Closed tussock grasslands in coastal locations.**
13	**32**	**32a**	Closed tussock grasslands dominated by *Themeda arguens, Dichanthium sericeum* (Queensland bluegrass) or *Panicum* spp., *Eriachne* spp., *Fimbristylis* spp., *Aristida* spp. or *Imperata cylindrica* (blady grass) on marine and alluvial plains. (land zones 3, [12,2]) (GUP, CYP, BRB, [EIU, WET, CQC, NWH])
13	**32**	**32b**	Closed tussock grasslands and open woodlands on undulating clay plains and upland areas. Dominant species include *Heteropogon triticeus* (giant speargrass) or *Themeda arguens* or *Sarga plumosum* or *Imperata cylindrica* (blady grass) or *Mnesithea rottboellioides* (cane grass) / *Arundinella setosa*. With areas of open woodland dominated by tree species such as *Corymbia papuana* (ghost gum) / *Terminalia* spp. / *Vachellia ditricha*/ *Piliostigma malabaricum.* (land zones 9, 3, 12, 8, [5, 11]) (CYP, EIU, CQC, [WET, BRB, SEQ])
14			**HUMMOCK GRASSLANDS**

14	**33**	**33**	**Hummock grasslands dominated by *Triodia* spp. (spinifex) or *Zygochloa paradoxa* (sandhill canegrass) associations on dunefields or sandplains.**
14	**33**	**33a**	Hummock grasslands dominated by *Triodia basedowii* (hard spinifex) or *Zygochloa paradoxa* (sandhill canegrass) associations on dunefields or sandplains. (land zone 6) (CHC, [MGD, MUL, NWH])
14	**33**	**33b**	Hummock grasslands dominated by *Triodia pungens* or *T. longiceps* (giant grey spinifex) or *T. mitchellii* (buck spinifex) sandplains. (land zones 7, 5, 6 [9, 11, 3]) (MGD, CHC, MUL, NWH, GUP, DEU, [BRB])
15			**WETLANDS (SWAMPS AND LAKES)**
15	**34**	**34**	**Wetlands associated with permanent lakes and swamps, as well as ephemeral lakes, claypans and swamps. Includes fringing woodlands and shrublands.**
15	**34**	**34a**	Lacustrine wetlands. Lakes, ephemeral to permanent. Includes fringing woodlands and sedgelands. (land zones 3, [2]) (CHC, DEU, MUL, CYP, BRB, [SEQ, CQC, GUP, WET])
15	**34**	**34b**	Palustrine wetlands. Generally intermittent swamps/claypans (non floodplains) in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs. (land zones 3, [5]) (CHC, MUL, MGD, DEU, [BRB])
15	**34**	**34c**	Palustrine wetlands. Freshwater swamps on coastal floodplains dominated by sedges and grasses such as *Oryza* spp., *Eleocharis* spp. (spikerush) or *Baloskion* spp. (cord rush) / *Leptocarpus tenax* / *Gahnia sieberiana* (sword grass) / *Lepironia* spp. Includes small areas of estuarine wetlands. (land zones 3, 2, [1]) (GUP, CYP, BRB, SEQ, WET, [CQC])
15	**34**	**34d**	Palustrine wetlands. Freshwater swamps/springs/billabongs on floodplains ranging from permanent and semi-permanent to ephemeral. (land zone 3) (GUP, MGD, EIU, BRB, CYP, CHC, [NWH, MUL, SEQ, DEU, WET])
15	**34**	**34e**	Palustrine wetlands. Springs with water dependent herbs. (land zones 3, 10, 7) (GUP, NWH, MGD, MUL, CYP, [DEU, EIU])
15	**34**	**34f**	Palustrine wetlands. Sedgelands/grasslands on seeps and soaks on wet peaks, coastal dunes and other non-floodplain features. (land zones 3, 9-10, 12, 5, [11]) (WET, SEQ, NET, CYP)
15	**34**	**34g**	Palustrine wetlands. Generally intermittent swamps/claypans on floodplains in inland areas dominated by chenopods e.g. *Chenopodium auricomum* (Queensland blue bush) or *Tecticornia* spp. (samphire) or herbs. (land zone 3) (CHC, [MGD, DEU, GUP, MUL, NWH)
16			**MANGROVES AND TIDAL SALTMARSHES**
16	**35**	**35**	**Mangroves and tidal saltmarshes.**
16	**35**	**35a**	Closed forests and low closed forests dominated by mangroves. (land zone 1) (CYP, GUP, BRB, SEQ, WET, CQC)
16	**35**	**35b**	Bare saltpans ± areas of *Tecticornia* spp. (samphire) sparse forbland and/or *Xerochloa imberbis* or *Sporobolus virginicus* (sand couch) tussock grassland. (land zone 1) (BRB, CQC, CYP, GUP, SEQ, WET)
			*Acacia dominated groups may include communities dominated by ecologically allied taxa e.g. wooded downs dominated by *Ventilago* etc. in the MGD bioregion.
			*Melaleuca dominated groups may include communities dominated by ecologically allied taxa e.g. *Lysiphyllum* spp., *Atalaya* spp. in the GUP bioregion.
			*Eucalypt dominated groups may include communities dominated by allied taxa e.g. *Eucalyptus, Corymbia, Lophostemon, Angophora, Syncarpia.*
			Coastal bioregions = All of CQC, CYP, SEQ, WET; and subregions 1, 2, 12 and 14 of BRB; and subregions 1 and 10 of the GUP
			Inland bioregions = Most of BRB and GUP; All of CHC, DEU, EIU, MGD, MUL, NET and NWH.

Appendix 6 Regional ecosystems corresponding to ecological communities listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (January 2019)

BVGs	Description	Component Regional Ecosystems
Critically Endangered Ecological Communities		
3a/2c/ 5c/7a	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia (only within two km of the coastline)	3.12.20 (BVG 2c), 3.2.1a & b, 3.2.11, 3.2.12, 3.2.13, 3.2.28, 3.2.29, 3.2.31, 7.2.1a, b, c, e, f, i, 7.2.2a-h, 7.2.5a, 7.2.6b, 8.2.2, 12.2.2 (BVG 3a), 7.2.1d, g, h (BVG 4a), 7.12.11d (BVG 5c), 7.11.3b (BVG 7a)
2a/4a/ 4b/5a	Lowland Rainforest of Subtropical Australia	12.8.3, 12.8.4, 12.11.10, 12.12.16 (BVG 2a), 12.11.1, 12.12.1 (BVG 4a), 12.3.1 (BVG 4b), 12.5.13, 12.8.13, (BVG 5a)
2d	Mabi Forest (Complex Notophyll Vine Forest 5b)	7.3.37, 7.8.3
30a	Natural grasslands on basalt and fine-textured alluvial plains of northern NSW and southern QLD	11.3.21, 11.3.24 (subregions 31, 32, 33, 34, 35, 36 of the Brigalow Belt bioregion)
15b	New England Peppermint (*Eucalyptus nova-anglica*) Grassy Woodlands	13.3.2
21b	Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland	12.3.18, 12.9-10.11 (BVG21b), 12.3.19 (BVG13d)
15b/ 15a/ 11a	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	11.8.2a, 11.8.8 (BVG 11a), 11.9.9a, 13.11.8, 13.12.8, 13.12.9 (BVG 15a), 11.3.23, 13.3.1, 13.3.4, (BVG 15b) Minor occurrences in 12.8.14, 12.8.16, 12.8.17 (BVG 11a), 13.11.3 (BVG 13c), 13.11.4 (BVG 17b).
Endangered Ecological Communities		
25a	Brigalow (Acacia harpophylla dominant and co-dominant)	6.4.2, 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11. 4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6,11.11.14, 11.12.21, 12.8.23, 12.9-10.6, 12.12.6 (all are part of BVG25a)
16c/ 16a	Eucalypt tall open forests Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	11.3.3, 11.3.15, 11.3.16, 11.3.28 (BVG16c) and 11.3.37 (BVG16a).
21a	Broad leaf tea-tree (*Melaleuca viridiflora*) woodlands in high rainfall coastal north QLD	7.3.8a-d, 7.5.4g, 8.3.2, 8.5.2a, c, 8.5.6 (BVG 21a)
30b/ 30a	Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	11.3.21 (BVG30a), 11.4.4, 11.4.11, 11.8.11, 11.9.3, 11.9.12, 11.11.17 (BVG30b), (subregions 6, 9, 10, 11, 12, 13, 15, 23 of the Brigalow Belt bioregion)
7a/ 3a	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8, 11.11.18 (BVG7a), 11.2.3 (BVG3a)
34e	The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	2.3.39, 4.3.22, 5.3.23, 6.3.23, 10.3.31, 11.3.22 (BVG 34e)
	Weeping Myall Woodlands	Minor extent of REs 11.3.2 (BVG 17a) and 11.3.28 (BVG 16c)
Of Concern Ecological Communities		
35b	Saltpan vegetation including Sporobolus virginicus grassland, samphire forbland and sedgelands on marine clay plains	12.2.1 (south of the Tropic of Capricorn (23·5ºS)