



**South East Queensland Horse Trail
Network Interim Assessment: Tewantin
National Park & Eumundi Conservation
Park**



**Queensland
Government**

Prepared by: Ecological Sciences, Queensland Herbarium and Biodiversity Science, Department of Environment and Science

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Introduction

Tewantin National Park is located between Noosa and Cooroy and is a refuge for native wildlife. The national park is primarily composed of rainforest, open eucalypt forest and wallum remnants. Tewantin National Park (1,299ha) and Tewantin National Park (Recovery) (672ha) were originally declared in 2010 (QPWS 2013). Previously State Forest 959 until 2001 and subsequently Tewantin Forest reserves 1 and 3, these parcels were converted through the South East Queensland Forests Agreement (SEQFA) to protect representative South East Queensland ecosystems. Tewantin National Park (Recovery) was declared to allow for the phasing out of foliage harvesting. Permits for foliage (fern) harvesting have now expired and the recommendation was made in 2011 for the recovery areas to be transferred to national park. Recent additions from Yurol and Ringtail State forests in 2011 increased the size of Tewantin National Park to 2,371ha. Tewantin National Park and Tewantin National Park (Recovery) protect a high diversity of vegetation types, native plants and animals (QPWS 2013). The management area falls within the traditional country identified by the Kabi Kabi and Gubbi Gubbi peoples. An Aboriginal trail reportedly runs along Gyndier Drive across several tenures, associated with several scar trees, artefacts, and a possible grinding site. The route was subsequently used as the original European track west from the coast. Gyndier Drive was developed as main road up the range before the new Tewantin–Cooroy Road was developed. Other sites and artefacts are reported to occur on or near protected area estate (QPWS 2013).

Eumundi Conservation Park consists of dry open forest, tall wet eucalypt forests and small pockets of rainforest. These forests provide an important refuge and corridor for wildlife in an increasingly urbanised environment. The park has a timber-getting history, beginning in the late 1800s when Eumundi township was settled. Logging ceased in 1996 and Eumundi Conservation Park was declared in 2009 to protect the forest and wildlife that depends on it (QPWS 2015). All proposed activities need to meet duty of care requirements under the Aboriginal Cultural Heritage Act 2003. Non-indigenous historic places will be managed in accordance with the Queensland Heritage Act 1992 (QPWS 2015).

Horse riding has long been a part of the Queensland lifestyle, and many southeast Queensland forests are valued by horse riders as safe and scenic places to ride, although the number of riders is low (DERM 2011; Rossi *et al.* 2013). The south-east Queensland horse-riding trail network (HTN) includes more than 500km of trails within 29 reserves between Gympie and the State's southern border. The HTN trails link to a broader trail network that includes about 340km of trails in Queensland's forest plantations and at least 470km of trails on other tenures, including several other State Forests (DERM 2010).

Road and trail networks within native forest ecosystems are fundamental in providing access for the purposes of recreational use, extraction of forest products, fire control and routine resource management

(Ngugi *et al.* 2014). However disturbance associated with road construction and maintenance, as well as use by vehicles, cyclists, motorbikes, walkers and horses, increase the risk of invasion by non-native (weed) plant species along roads (Potito and Beatty 2005; Ansong and Pickering 2013). Once established in disturbed road verges, some invasive species may colonise adjacent undisturbed native vegetation (Ngugi *et al.* 2014).

Non-native species that become established in natural ecosystems compete with native species for available resources and can replace native species to the detriment of organisms that depend on these native species (Gower 2008). For example, non-native plant species have rapidly invaded and successfully displaced native species in many conservation areas in Australia (Ngugi and Neldner 2017) and buffel grass (*Cenchrus ciliaris*) forms monocultures in pasture lands of Queensland (Butler and Fairfax 2003).

Multiple vectors including vehicles, machinery, soil movement, animals, wind, water, and humans are involved in the spread of non-native species along forest trails (Ngugi *et al.* 2014). Horses have been implicated as significant vectors in the introduction of plant species observed adjacent to horse trails in nature reserves (Gower 2008). The risks associated with horse riding include seed movements through horse dung, hair, hoof debris, riders, and riding equipment. In a review of world-wide studies analysing the potential dispersal of weeds through horse dung, Ansong and Pickering (2013a) identified 156 naturalised plant species in Australia that germinate from horse dung. Other reported negative impacts from horse use include trampling of vegetation and soils, nutrient addition through urine and dung, introduction of pathogens, as well as enhanced erosion and sediment run-off. All these impacts may trigger changes in species composition of adjacent native ecosystems.

The objective of the Horse Trails Scientific Monitoring Program (DERM 2010) is to monitor horse riding on the Southeast Queensland Horse Riding Trail Network that traverses through Southeast Queensland protected areas, identify any impacts of such use and recommend management actions to address such impacts. Studies relating to the social, erosional and water quality impacts of horses and horse riding are available on the DES website ([Monitoring and managing potential impacts | Parks and forests | Department of Environment and Science, Queensland \(des.qld.gov.au\)](https://www.des.qld.gov.au/monitoring-and-managing-potential-impacts-parks-and-forests)).

This monitoring program was initiated in 2009 and established 52 paired long-term monitoring sites along designated horse trails located in conservation reserves in seven National Parks in southeast Queensland (Figure 1). These monitoring sites examine (1) the invasion and extent of non-native plant species along the management roads designated as horse trails; and (2) changes in BioCondition over time of vegetation adjacent the horse trails.

Methods:

Study location

Tewantin National Park (NP) covers an area of 3264.3 ha and Eumundi Conservation Park covers an area of 487.7 ha, totalling 3752 ha. These parks were assessed at four sites containing eight transects and spanning four Regional Ecosystems (REs). The four REs are 12.3.11 and 12.3.6 in Eumundi Conservation Park, and 12.5.6c and 12.9-10.1x1 in Tewantin National Park. The Technical Descriptions (TDs) for these REs are presented in Appendix 2. The TDs are detailed descriptions of the normal range in structure and floristic composition of remnant regional ecosystems and their component vegetation communities.

Table 1. Summary statistics for monitoring sites at Tewantin NP and Eumundi CP arranged by regional ecosystem.

Park name	Regional Ecosystem	Surface area (ha)	Proportion of park/reserve (%)	No. of transects examined
Eumundi Conservation Park	12.3.11 <i>Eucalyptus tereticornis</i> +/- <i>Eucalyptus siderophloia</i> , <i>Corymbia intermedia</i> open forest on alluvial plains usually near coast	4.8624	1	1
	12.3.6 <i>Melaleuca quinquenervia</i> +/- <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Corymbia intermedia</i> open forest on coastal alluvial plains	11.5923	2.4	1
Tewantin National Park	12.5.6c Four transects in <i>Eucalyptus pilularis</i> open forest on remnant Tertiary surfaces. Usually deep red soils	588.3	18	4
	12.9-10.1x1 <i>Eucalyptus resinifera</i> , <i>E. grandis</i> , <i>Corymbia intermedia</i> tall shrubby open forest often on remnant Tertiary surfaces	21	0.6	2

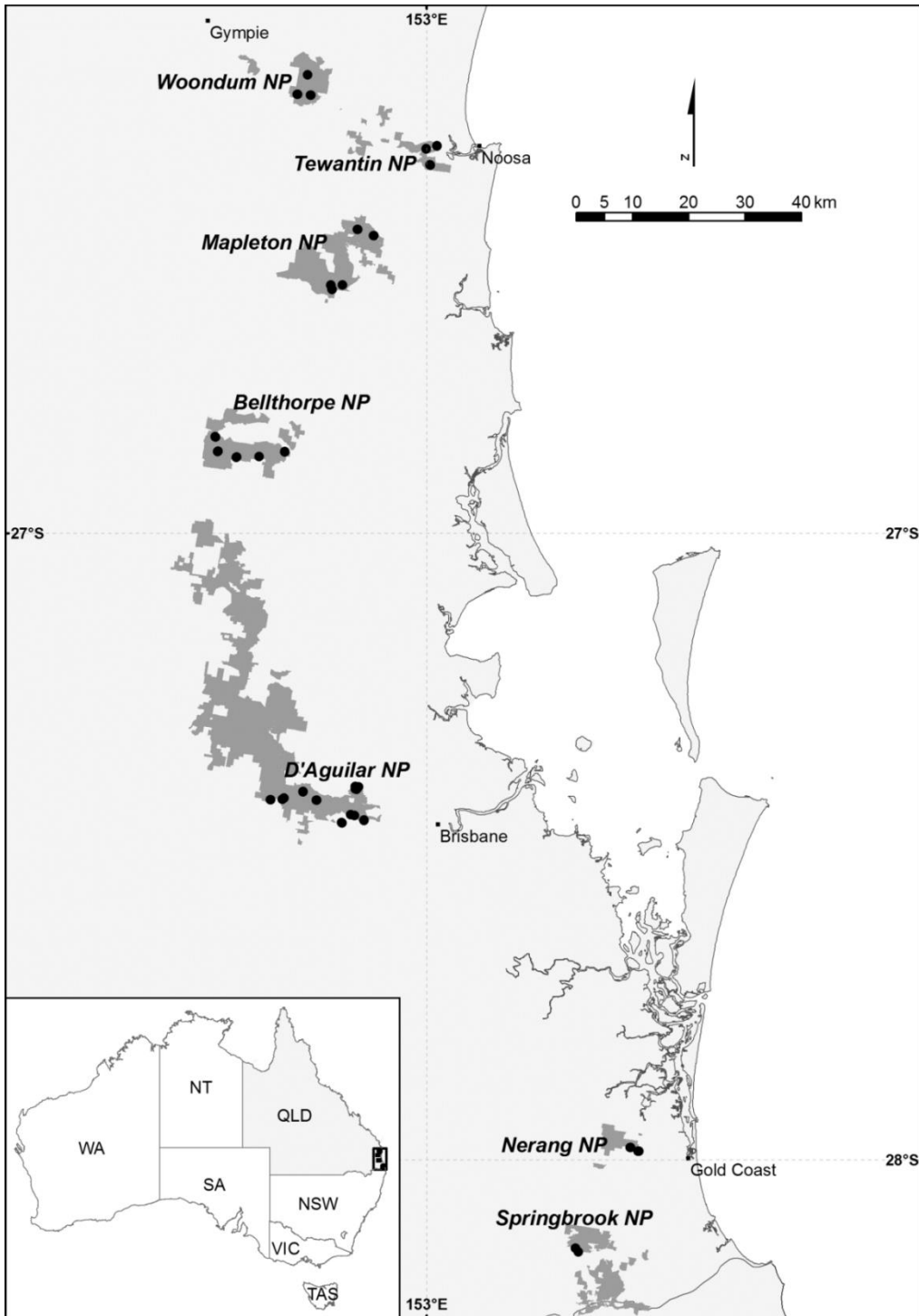


Figure 1. Map of Australia showing Queensland State, location of the seven National Parks (NP) in southeast Queensland that have designated horse trail network, and distribution and location of study sites (Ngugi *et al.* 2014)

Site selection and Sampling

Permanent sites for vegetation monitoring were in Tewanin were established in 2012 and 2013, and those in Eumundi were established in 2016 along the horse trail network in Tewanin National Park and Eumundi Conservation Park. Sites were overlaid where possible on existing ecological research plots used for vegetation mapping and classification purposes (Neldner *et al.* 2022), or native forest permanent plots used for long-term monitoring of forest growth (Ngugi *et al.* 2015), allowing surveys to add to existing valuable datasets. The data collection method is described in Ngugi *et al.* 2014).

1. Assessing impact of non-native species on the vegetation along management roads

Vegetation growing adjacent to the horse trail network was sampled using 20 m transects laid out perpendicular to the trail edge on both sides of the trail. The trail edge was defined as the shoulder edge of the trail surface where vegetation growth is evident, and from which point vegetation cover continues into the adjacent vegetation. Along each transect a total of eight quadrats were sampled. At the start of the transect five contiguous 1 x 1 m quadrats extending from the trail edge to 5 m into the forest were sampled to estimate spread of non-native species. Contiguous plots were used to accurately determine the distance of influence from the trail edge that was impacted by non-native species. In addition, 1x1 m plots were sampled at 10 m, 15 m, and 20 m along the transect line. In each 1x1 m plot, all plant species were recorded, and the projective foliage cover of each ground layer species (less than 1.5 m in height) was estimated. Cover was also assessed for leaf litter, bare-ground and coarse woody debris (> 10 cm diameter) as a percentage of the total area in each quadrat (1 m²). This sampling design is very similar to that used by Potito and Beatty (Potito and Beatty 2005) and Gower (Gower 2008).

2. Assessing the condition of the forest regional ecosystems

To sample the species diversity and cover composition in the relatively less disturbed adjacent native forest at each location, a 50 x 10 m forest transect was established parallel to the horse trail and 25 m from the trail edge. All vascular plant species observed within the transect were recorded and the cover of ground stratum species was assessed in five 1x1 quadrats along the transect midline. Comprehensive sampling of the structure and floristics of the forests followed the method of Neldner *et al.* (2022) and allowed each site to be assessed for their BioCondition (Eyre *et al.* 2015).

Plant species identification and categorisation

All herbaceous and woody vascular species observed within each plot were identified to species in the field where possible. Where necessary specimens were collected and brought to the Queensland Herbarium for identification. Where available material was insufficient to identify species, identity was recorded at genus level. Nomenclature, and native and non-native status follows the Census of

Queensland Flora 2021 (Brown 2021). Characterisation of species as environmental weeds, weeds of national significance and/ or declared weeds under State legislation was done using the online facility maintained by the Queensland Department of Agriculture, Fisheries and Forestry (QPWS 2022).

Results:

Tewantin National Park and Eumundi Conservation Park were assessed at four sites containing a total of eight transects across four Regional Ecosystems (RE's). Detailed results for the non-native species richness and vegetation cover, and BioCondition scores for the transects at each site are provided in the report cards in Appendix 1.

A summary of non-native species richness and cover in the trail-edge transect is presented in Table 2. The highest observed mean cover of non-native species was 6.6%, and the highest observed cover at a site was 16% and highest mean of non-native species richness was one species. Within the QBEIS transect, the highest mean cover of non-native species was 5.4% (Table 2). The highest mean of non-native species richness in the QBEIS sites was 3 species with majority of QBEIS sites having less than three species (Table 2).

BioCondition score among all the sites ranged from 71 to 99% on a 0 to 100% scale (the higher the score the better the condition) with the lowest mean score of 73% at Eumundi 1B indicating that most sites were in reasonable condition (Table 3). The lowest BioCondition scores (71%) was recorded at the Harry Spring Conservation Park. The highest BioCondition scores were recorded in RE 12.5.6 at Tewantin 173B.

Table 2. Mean and range of non-native cover*, and absolute numbers (richness) of non-native species identified per visit at each sampled regional ecosystem within Tewantin NP and Eumundi CP. Values for both trail-edge and QBEIS transects are shown.

Regional Ecosystem	Sites	Site Visit	TRAIL-EDGE TRANSECTS				QBEIS TRANSECTS			
			Cover mean (%)	Cover range (%)	Species mean (count)	Species range (count)	Cover mean (%)	Cover range (%)	Species mean (count)	Species range (count)
12.3.11 <i>Eucalyptus tereticornis</i> +/- <i>Eucalyptus siderophloia</i> , <i>Corymbia intermedia</i> open forest on alluvial plains usually near coast	Eumundi 1A	1	0.5	0.5	1	0 – 1	0.6	0.6	2	2
		2	0	0	0	0	0	0	2	2
			-	-	-	-	-	-	-	-
12.3.6 <i>Melaleuca quinquenervia</i> +/- <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Corymbia intermedia</i> open forest on coastal alluvial plains	Eumundi 1B	1	0	0	0	0	1.5	-1.5	2	2
		2	0.5	0.5	1	0 – 1	0	0	1	1
		-	-	-	-	-	-	-	-	-
12.5.6c <i>Eucalyptus pilularis</i> open forest on remnant Tertiary surfaces. Usually deep red soils	Tewantin 13705B, Tewantin 13705A Tewantin 173A, Tewantin 173B	1	3.2	0 – 11.7	1	0 – 1	0.8	0 – 1.5	1.5	1 – 2
		2	1.7	0 – 5	1	0 – 1	5.4	5.4	3	3
		3	6.6	0 – 16	1	0 – 2	1.3	1.3	3	3
12.9-10.1x1 <i>Eucalyptus resinifera</i> , <i>E. grandis</i> , <i>Corymbia intermedia</i> tall shrubby open forest often on remnant Tertiary surfaces	Tewantin G & H_B	1	0	0	0	0	0	0	0	0
		2	0	0	0	0	0	0	0	0
		3	0	0	0	0	0	0	1	1

*non-native cover is the sum of weeds recorded in the ground and shrub layers (Eyre et al. 2015)

Table 3. Mean and range of BioCondition scores for the QBEIS (forest) sites summarised by regional ecosystem within Tewantin NP and Eumundi CP National Park.

Regional Ecosystem	Sites	Site Visit	BioCondition Mean	BioCondition Range
12.3.11 <i>Eucalyptus tereticornis</i> +/- <i>Eucalyptus siderophloia</i> , <i>Corymbia intermedia</i> open forest on alluvial plains usually near coast	Eumundi 1A	1	88	88
		2	85	85
		3	-	-
12.3.6 <i>Melaleuca quinquenervia</i> +/- <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Corymbia intermedia</i> open forest on coastal alluvial plains	Eumundi 1B	1	86	86
		2	73	73
		3	-	-
12.5.6c <i>Eucalyptus pilularis</i> open forest on remnant Tertiary surfaces. Usually, deep red soils	Tewantin 13705B, Tewantin 13705A Tewantin DYP 173A, Tewantin DYP 173B	1	80	73 – 85
		2	78	74 – 83
		3	87	74 – 99
12.9-10.1x1 <i>Eucalyptus resinifera</i> , <i>E. grandis</i> , <i>Corymbia intermedia</i> tall shrubby open forest often on remnant Tertiary surfaces	Tewantin G & H_A, Tewantin G & H_B	1	76	71 – 81
		2	80	77 – 82
		3	81	71 – 90

Discussion and Conclusions

This study investigated the impacts of horse riding along horse trails and the risk of horses acting as vectors in the introduction of non-native plant species adjacent protected areas within Tewantin National Park and Eumundi Conservation Park in southeast Queensland.

Non-native species

The construction, maintenance and use of horse trail networks that traverse regions of native vegetation may predispose these ecosystems to invasion by non-native plant species (Ngugi *et al.* 2014). However, following comprehensive sampling of four sites (eight transects) across three sampling time points (2012/2013, 2017 and 2020), the majority of sites along designated horse trails in Tewantin National Park and Eumundi Conservation Park showed either no invasion or low levels of invasion by non-native species.

Generally, across both parks – when non-native species were present – they occurred as either single or a few plants at any given site. Incursion of *Cinnamomum camphora* was the only species found across both Tewantin National Park and Eumundi Conservation Park with cover < 6% and did not discriminate between the trail-edge and deeper forest transects.

Among the regional ecosystems examined in these parks, non-native species cover and richness was recorded in *Eucalyptus pilularis* open forest occurring on remnant Tertiary surfaces with deep red soils 12.5.6c (Table 2). This may be the result of track broadening prior to 2016 in Tewantin National Park. Track broadening and the associated mechanical disruption at sites 13705A and 13705B may be a driver of the incursion of non-native species along the trail-edge with *Paspalum mandiocanum* found at both sites, with increasing cover of this species through time at site 13705A. *Cyperus brevifolius* was also found at 13705B, but only in 2019. Further, sites contained within RE12.5.6c were the only sites in Tewantin National Park found to be increasing in non-native species cover through time and this marked increase over time was primarily associated with the trial-edge transects, rather than the QBEIS forest sites.

Conversely, trail broadening at sites Tewantin G&HA and Tewantin G&HB did not appear to predispose these areas to incursion as no non-native species were located at either the trail-edge or forest transects of these sites (Table 2). These sites were located in an ecosystem consisting primarily of *Eucalyptus resinifera*, *E. grandis* and *Corymbia intermedia* tall shrubby open forest occurring on remnant Tertiary surfaces (12.9-10.1x1), suggesting that this RE may be less susceptible to incursion by non-natives or that weed management strategies at these sites have been more effective compared to RE 12.5.6c.

BioCondition scores within the forest transects

Both Tewantin National Park and Eumundi Conservation Park exhibited mostly high BioCondition scores overall. Interestingly, the non-native incursions found at sites within regional ecosystem 12.5.6c did not significantly affect the average BioCondition scores of the sites when compared to sites associated with the other examined regional ecosystems (Table 3). The only site to show a moderate score was site Tewantin G&HA which had no large trees greater than 59 cm in diameter due to past logging and was found to occur in *Eucalyptus resinifera*, *E. grandis*, *Corymbia intermedia* tall shrubby open forest within RE 12.9-10.1x1.

Conclusion

The threat of incursion by non-native species is present in Tewantin National Park and Eumundi Conservation Park, primarily because of continued and active usage of trails for recreation and mechanical maintenance of the trails, such as trail broadening. In addition, past logging activity continues to affect the BioCondition scores of some sites due a lack of large trees. However, QPWS&P management has kept up with trail edge maintenance and hence reducing incursion and spread of non-native species. Continued monitoring and management of non-native species should continue, particularly in regional ecosystem 12.5.6c. The BioCondition scores in these parks were generally high with a single moderate score resulting from past logging.

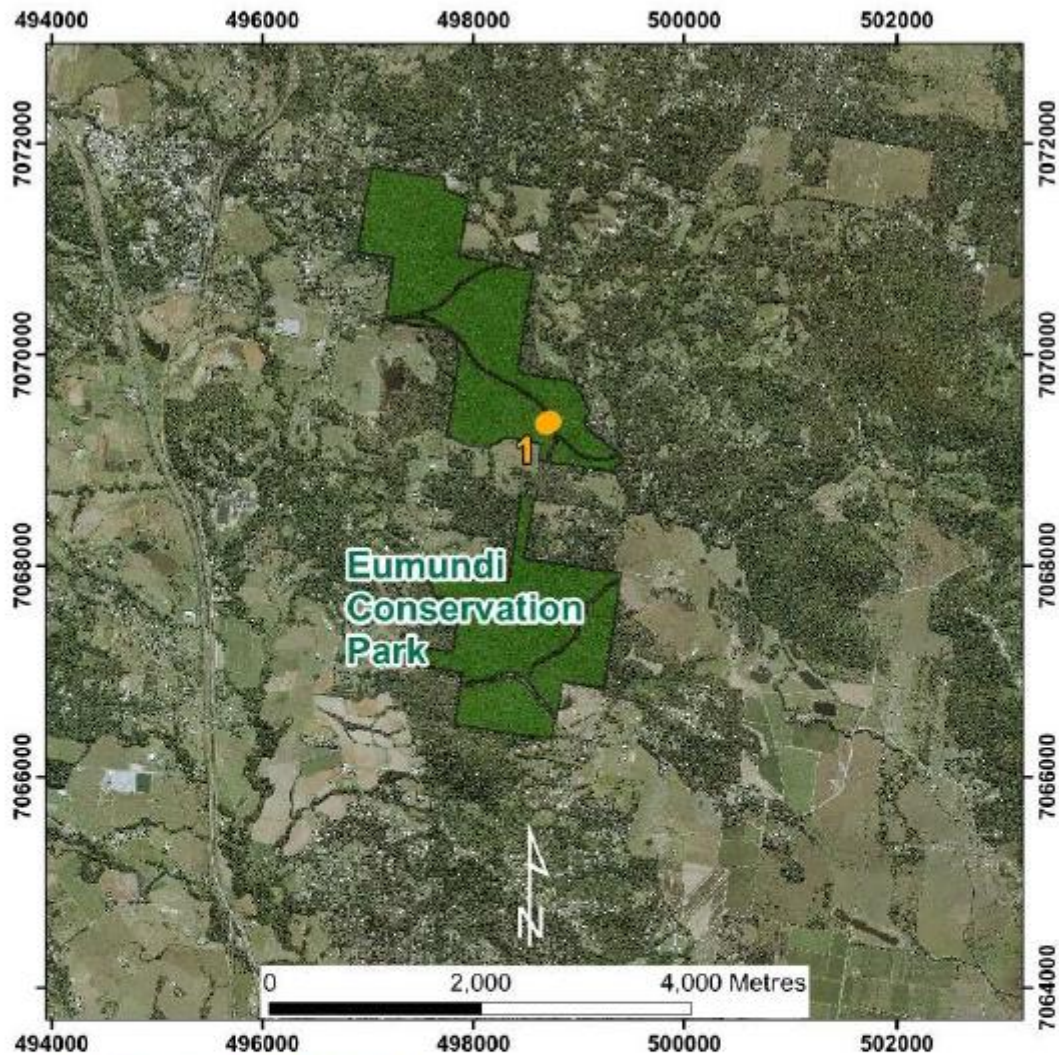
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Appendix I. Site report cards

Eumundi Conservation Park: Site 1



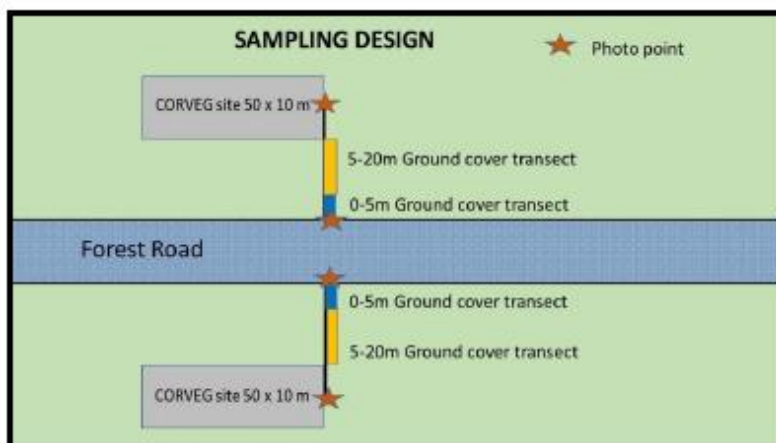
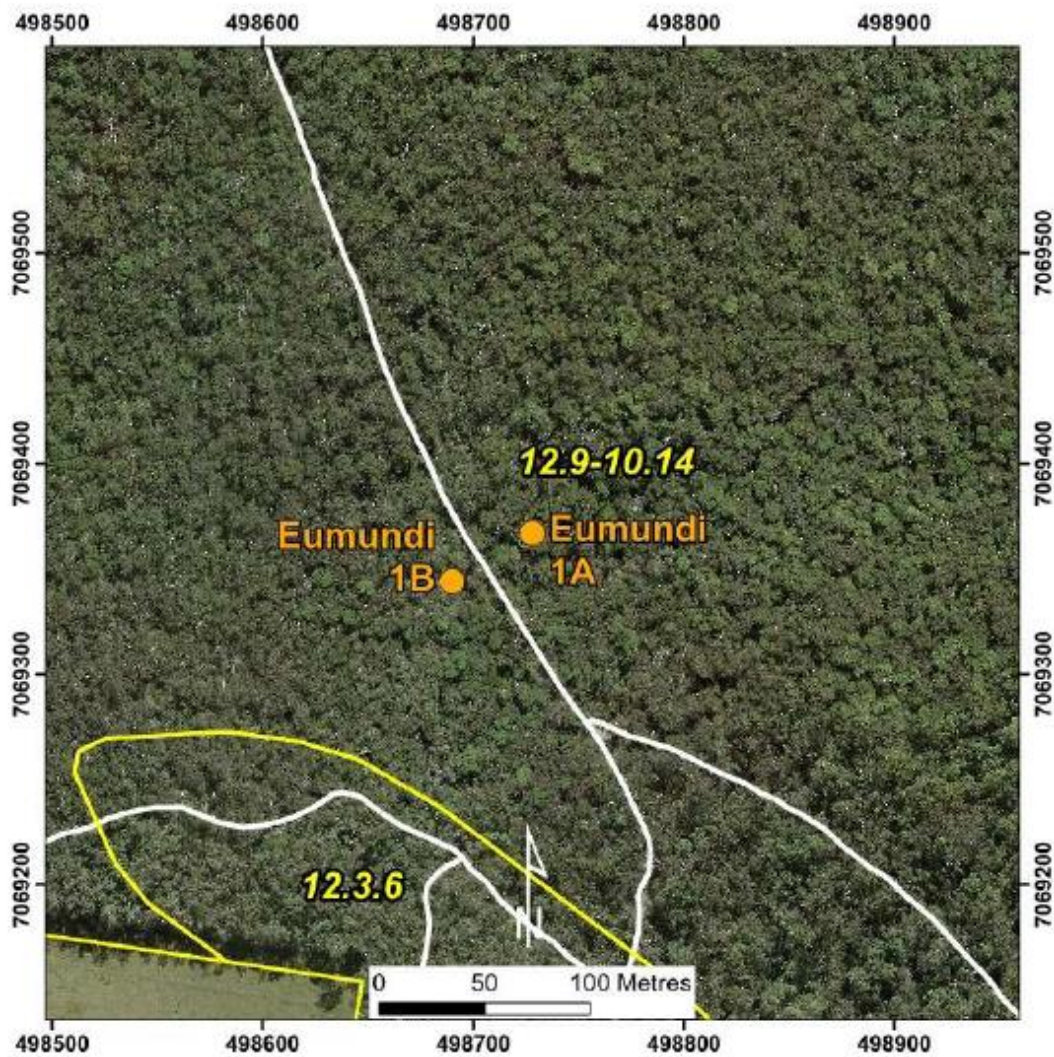
SEQ Monitoring Report Card

Eumundi 1A

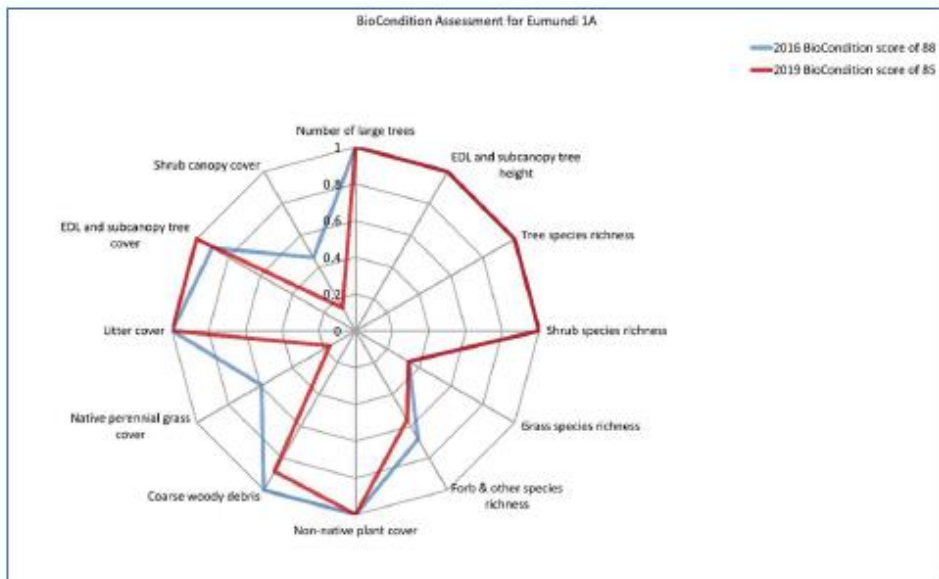
Regional Ecosystem 12.3.11

Eucalyptus resinifera, *Corymbia intermedia*, *Lophostemon suaveolens*
open forest

Queensland Herbarium, October 2021



QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2016 – 88 2019 – 85
 Fire History: No fire data



Forest monitoring transect September 2016 Forest monitoring transect September 2019

General Comments: This site was only established in 2016. The site consistently had a high BioCondition score. The perennial grass cover and shrub cover decreased between the two samplings, while species richness remained the same. The only non-native species were young *Cinnamomum camphora* and a single palm *Syagrus romanzoffiana*.

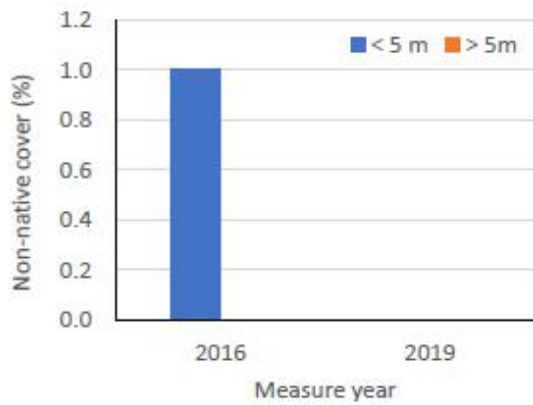
Trail-edge ground cover transect at Eumundi 1A



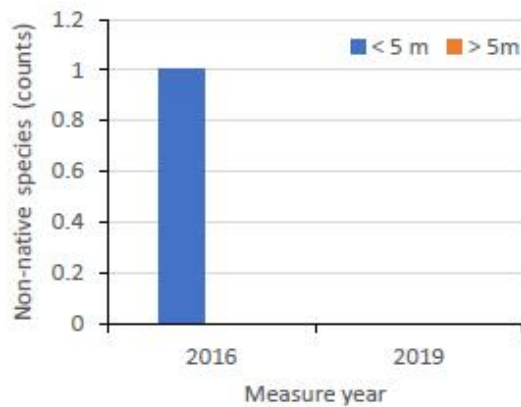
Trail-edge transect September 2016



Trail-edge transect September 2019

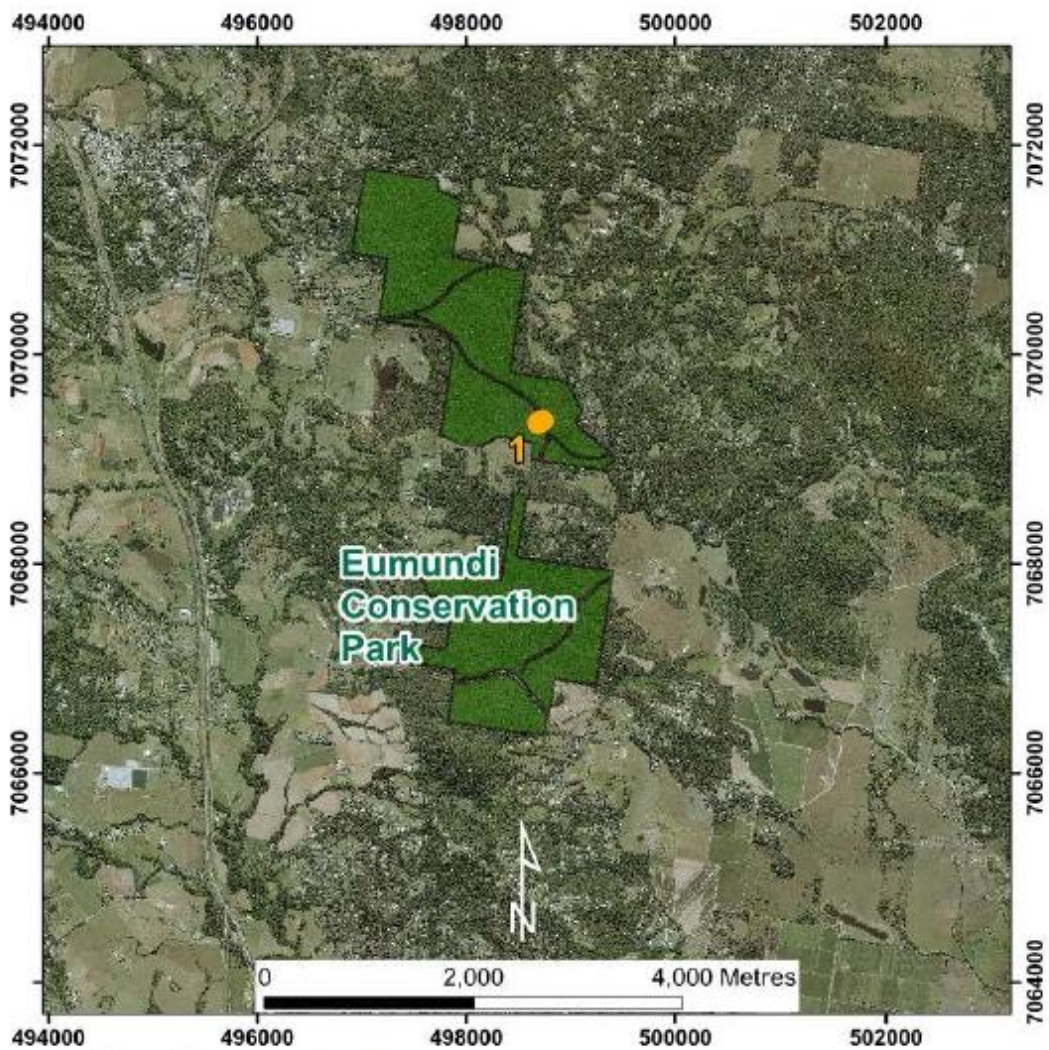


Non-native species cover



Number of non-native species

General comments: The only non-native species on the trail-edge transect was a single *Cinnamomum camphora* (camphor laurel) adjacent the road in 2016 only.



SEQ Monitoring Report Card

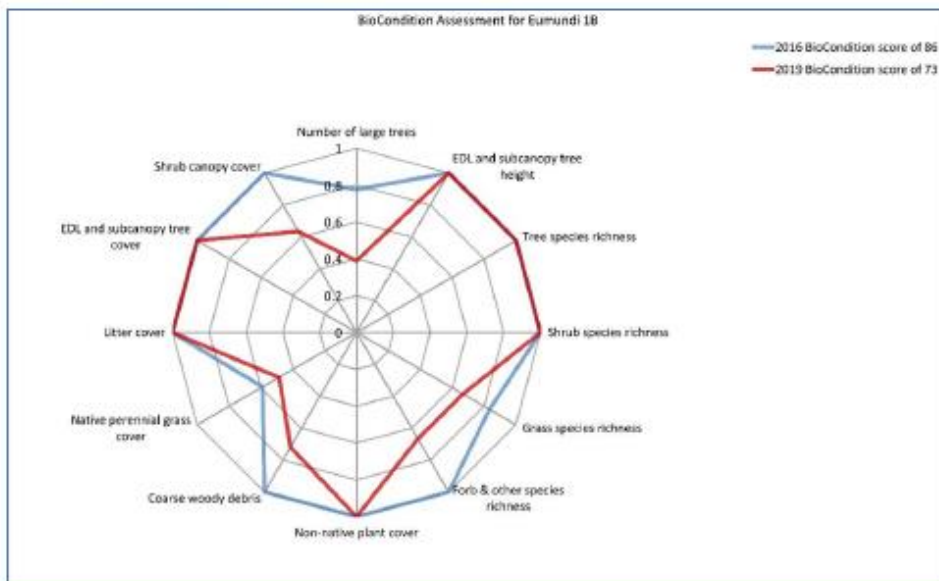
Eumundi 1B

Regional Ecosystem 12.3.6

Corymbia intermedia, *Lophostemon suaveolens* open forest

Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2016 – 86 2019 – 73
 Fire History: No fire data



Forest monitoring transect September 2016 Forest monitoring transect September 2019

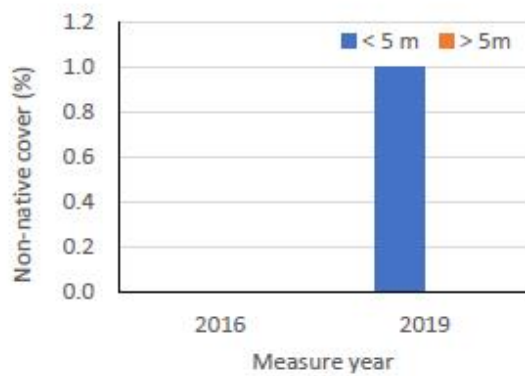
General Comments: This site had a high BioCondition score that decreased at the second sampling, because of decreased forb and grass species richness, decreased shrub cover and decreased number of large trees.

Trail-edge ground cover transect at Eumundi 1B

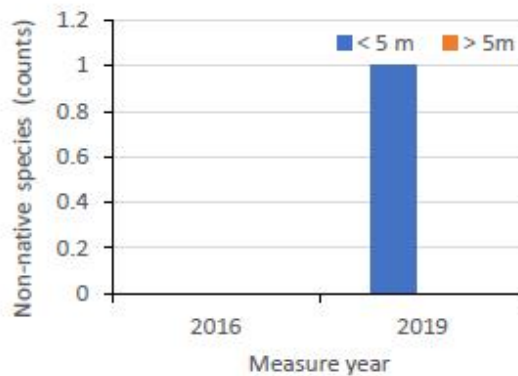


Trail-edge transect September 2016

Trail-edge transect September 2019

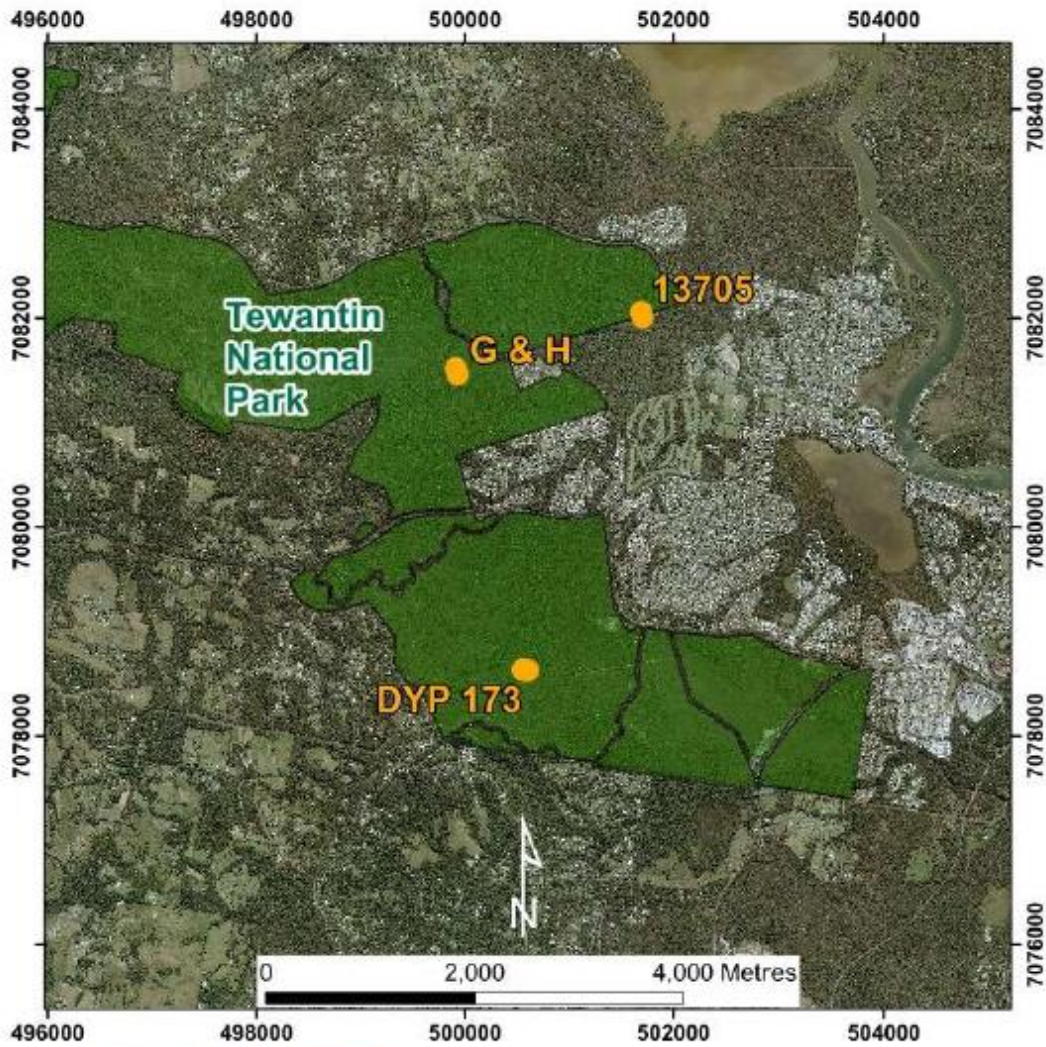


Non-native species cover



Number of non-native species

Comments: The only non-native species on the trail-edge transect was a single *Cinnamomum camphora* (camphor laurel) near the road in 2019 only. There was a very low cover of *Lantana camara* and *C. camphora* present in the QBEIS site.



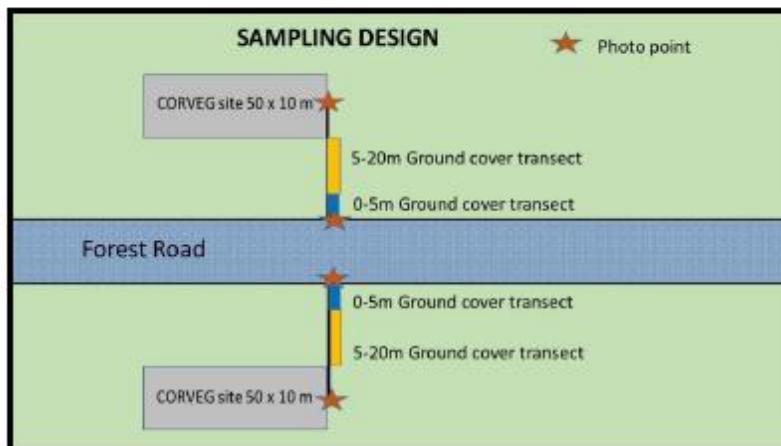
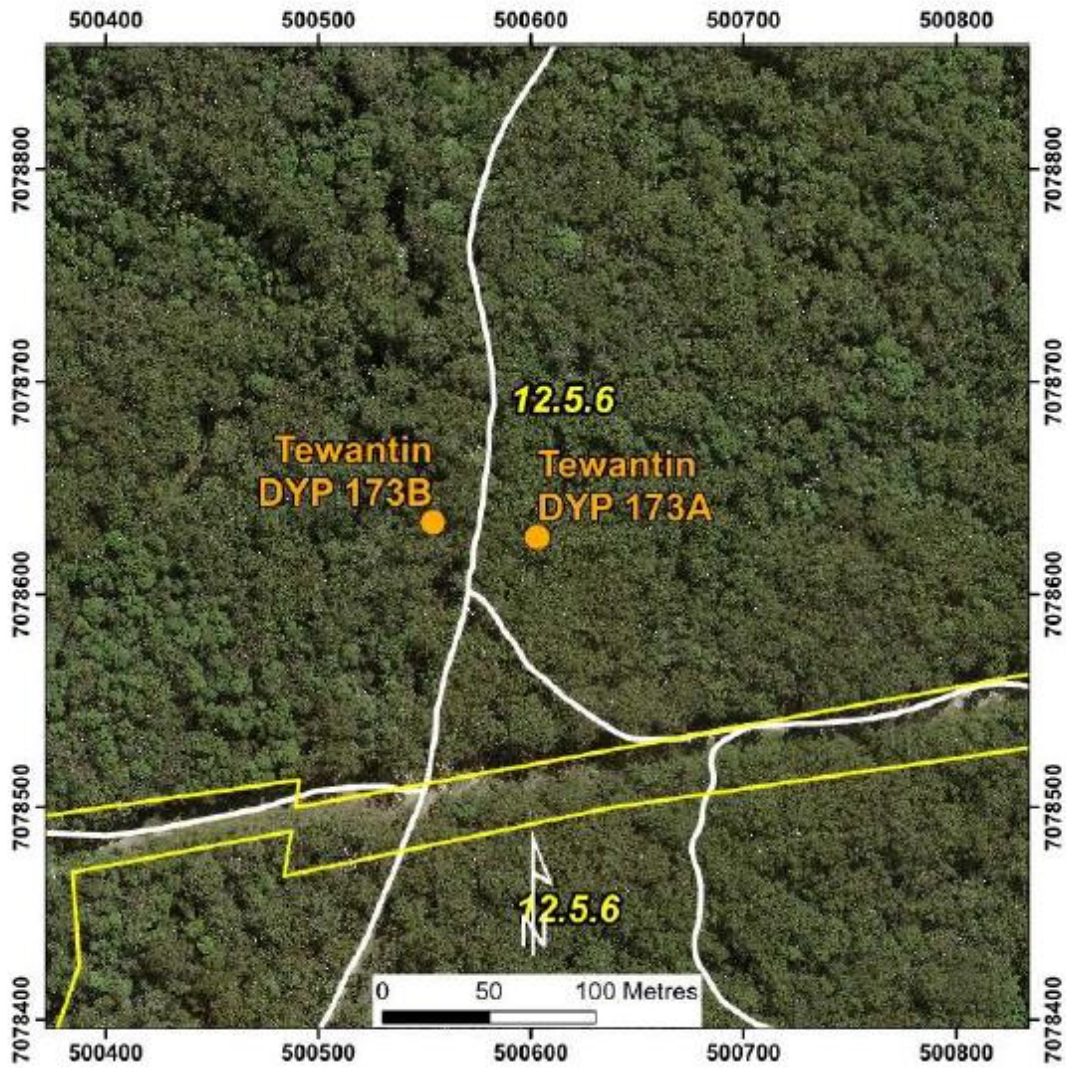
SEQ Monitoring Report Card

Tewantin 173A

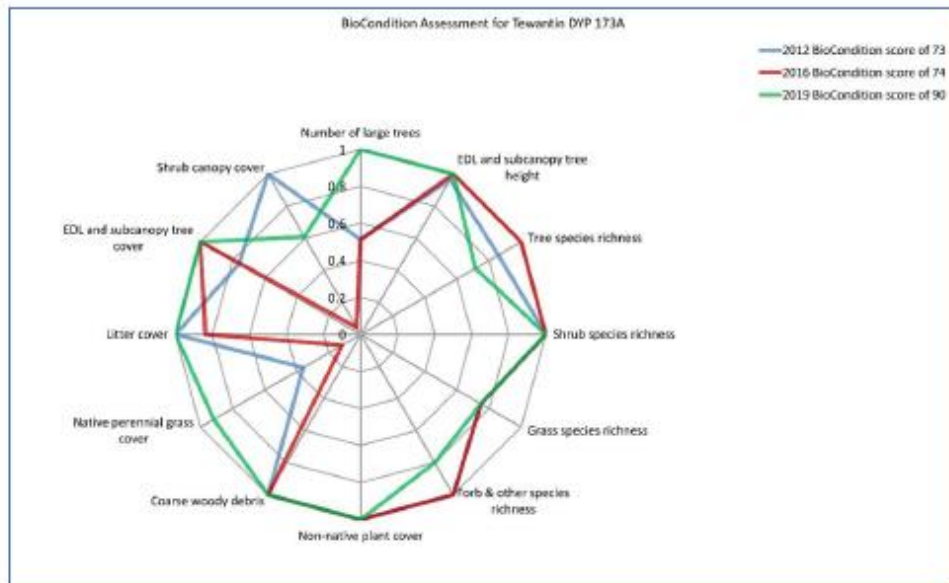
Regional Ecosystem 12.5.6

Eucalyptus pilularis, *Eucalyptus microcorys*, *Syncarpia glomulifera*
tall open forest

Queensland Herbarium, October 2021



QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 73 2016 – 74 2019 – 90
 Fire History: Burnt two months prior to September 2016



Forest monitoring transect September 2016 Forest monitoring transect September 2019

General Comments: The BioCondition score for this site has improved as more trees attained large tree benchmark threshold of > 61 cm diameter, and due to increase in perennial native grass cover post fire. The fire also reduced the shrub cover and killed most trees in the T3 layer. This site was formerly a Detailed Yield Plot and had been logged when the tenure was State Forest. *Lantana camara*, *Passiflora suberosa* and *Cinnamomum camphora* were recorded at low covers at this site.

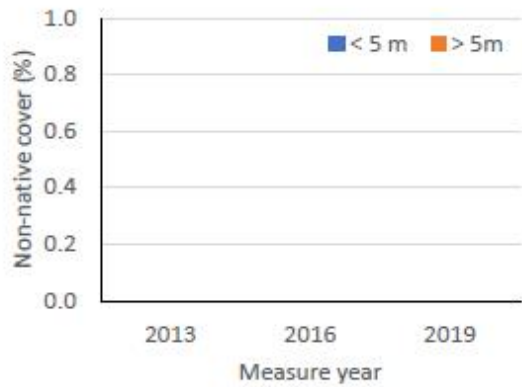
Trail-edge ground cover transect at Tewantin 173A



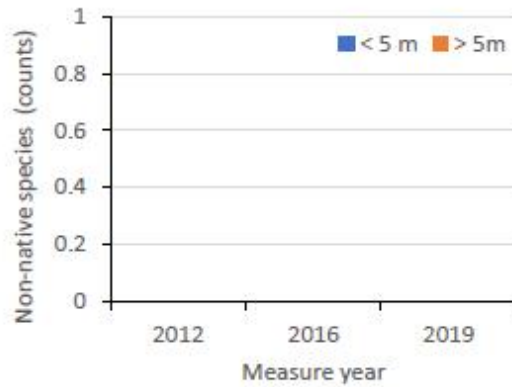
Trail-edge transect September 2016



Trail-edge transect September 2019

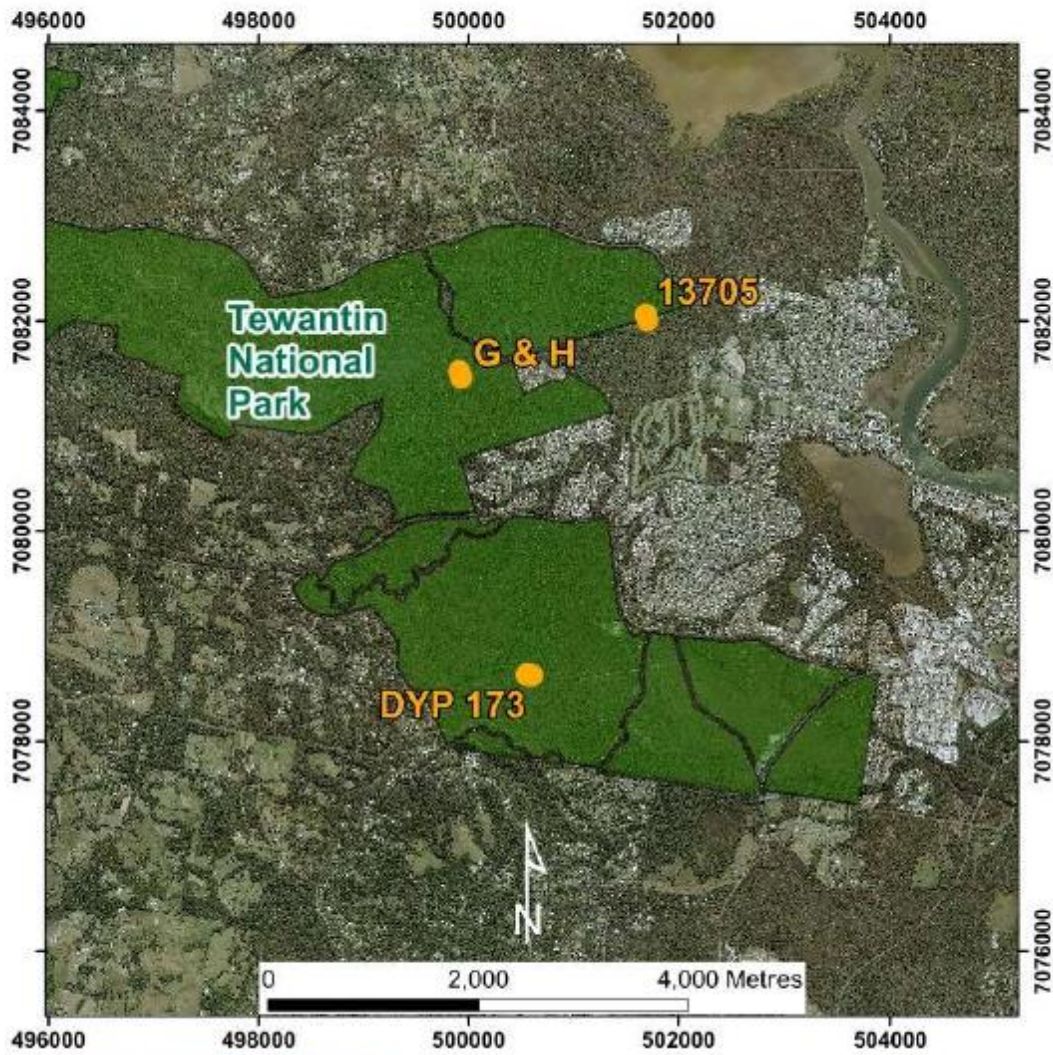


Non-native species cover



Number of non-native species

General comments: There were no non-native species recorded in the trail-edge transect.



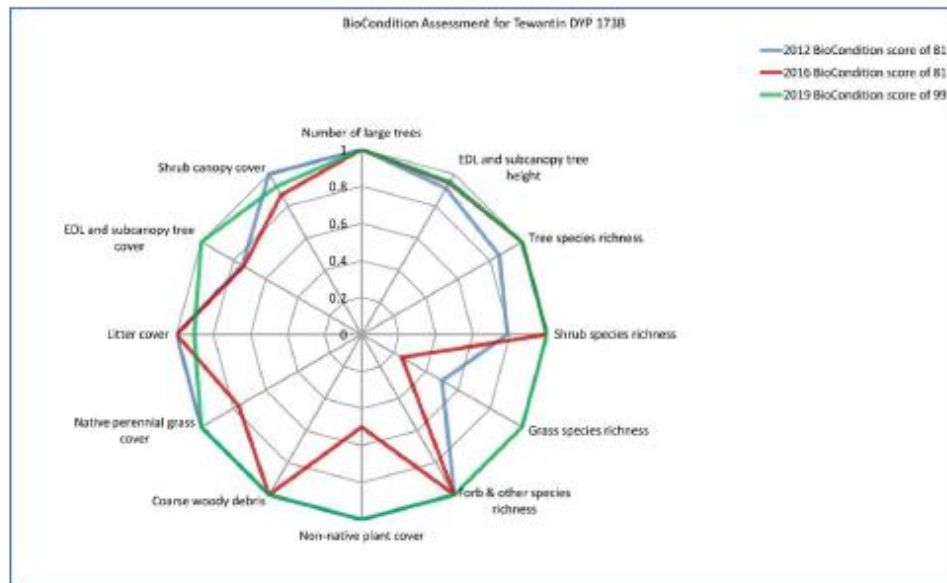
SEQ Monitoring Report Card

Tewantin 173B

Regional Ecosystem 12.5.6

Eucalyptus pilularis with *Lophostemon confertus* tall open forest with rainforest species in the understorey.
Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 81 2016 – 81 2019 – 99
 Fire History: Burnt August 2017



Forest monitoring transect September 2016 Forest monitoring transect September 2019

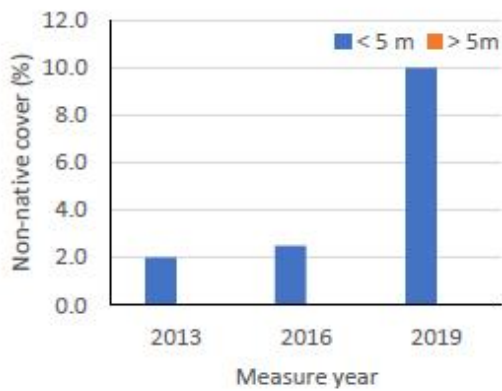
General Comments: This site has improved from a high to very high BioCondition score. Grass species richness and native grass cover decreased while tree and shrub species richness increased from 2012 to 2016. All values except litter cover improved in the period 2016 to 2019, likely due to the prescribed burn in 2017. A single non-native palm *Syagrus romanzoffiana* was consistently present but a low cover of the non-native *Lantana camara* and *Passiflora suberosa* was recorded in 2021.

Trail-edge ground cover transect at Tewantin 173B

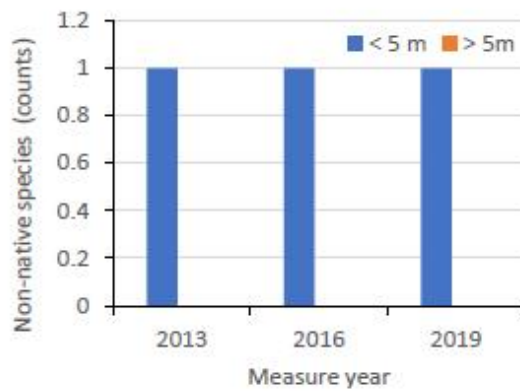


Trail-edge transect September 2016

Trail-edge transect September 2019

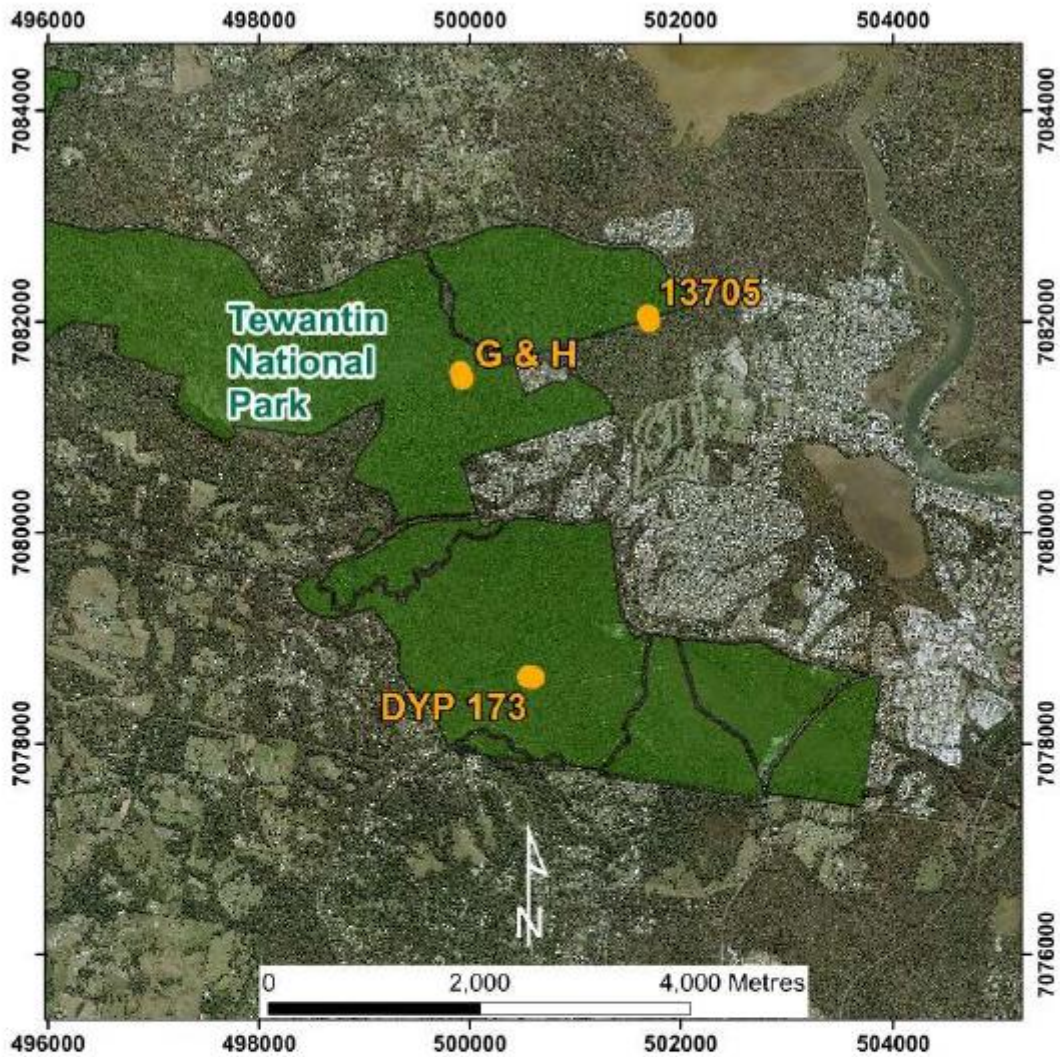


Non-native species cover



Number of non-native species

General comments: The only non-native species was camphor laurel (*Cinnamomum camphora*) which was consistently recorded at the trail edge but has now increased in cover to 10%. This young tree is accessible and need to be timely removed.



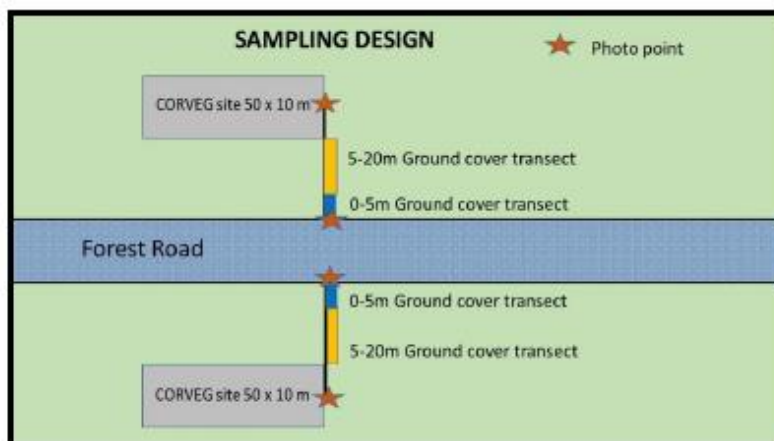
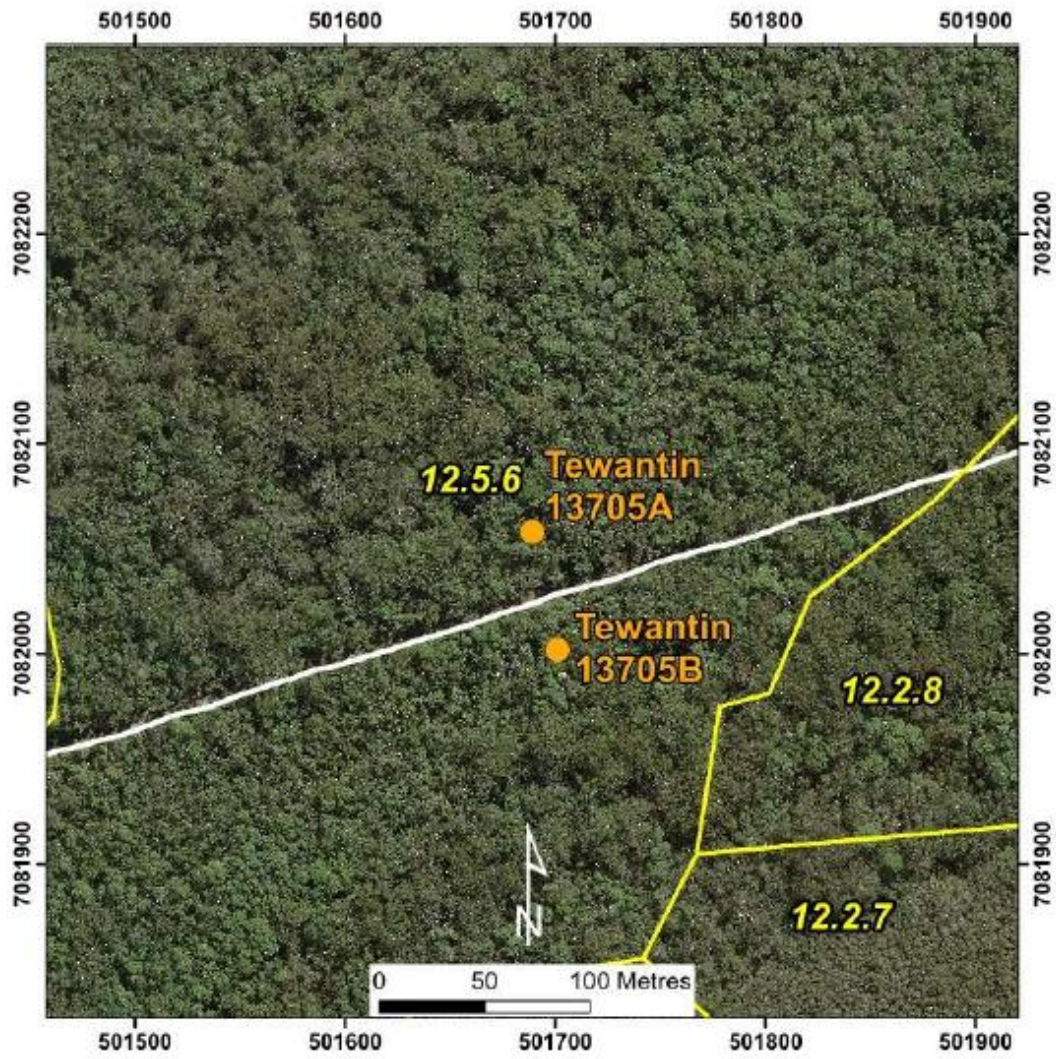
SEQ Monitoring Report Card

Tewantin 13705A

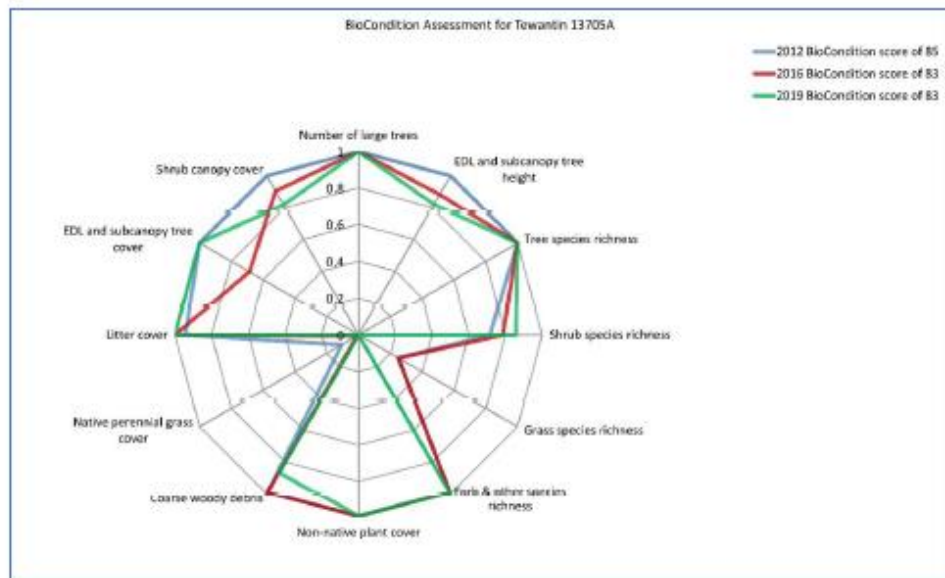
Regional Ecosystem 12.9-10.1x1

Eucalyptus robusta, *E. pilularis*,
Lophostemon confertus, *Syncarpia*
glomulifera open forest

Queensland Herbarium, October 2021



QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 85 2016 – 83 2019 – 83
 Fire History: no known fires



Forest monitoring transect September 2016 Forest monitoring transect September 2019

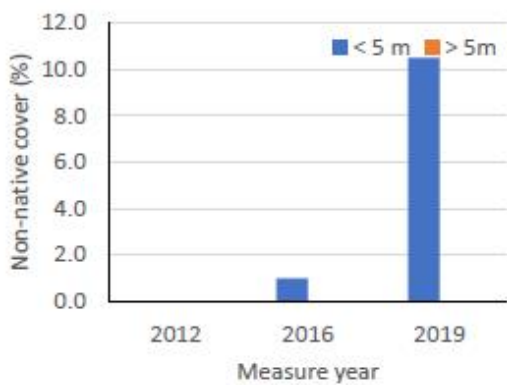
General Comments: This site consistently had a high BioCondition score. Perennial grass cover and grass richness was consistently low. There were no non-native species recorded in the QBEIS site. This site was first recorded as a QBEIS site 13705 (site visit 3228) on the 27 October 1993. The RE 12.9-10.1x1 is recognised as occurring on land zone 5 highly weathered surface.

Trail-edge ground cover transect at Tewantin 13705A

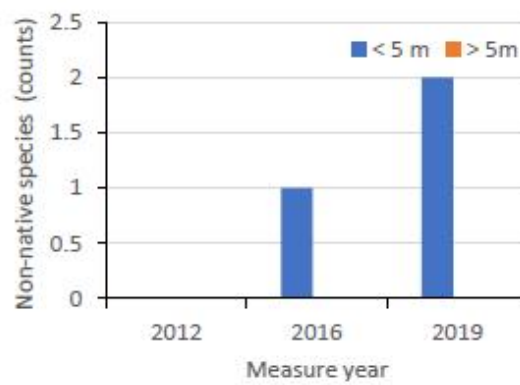


Trail-edge transect September 2016

Trail-edge transect September 2019

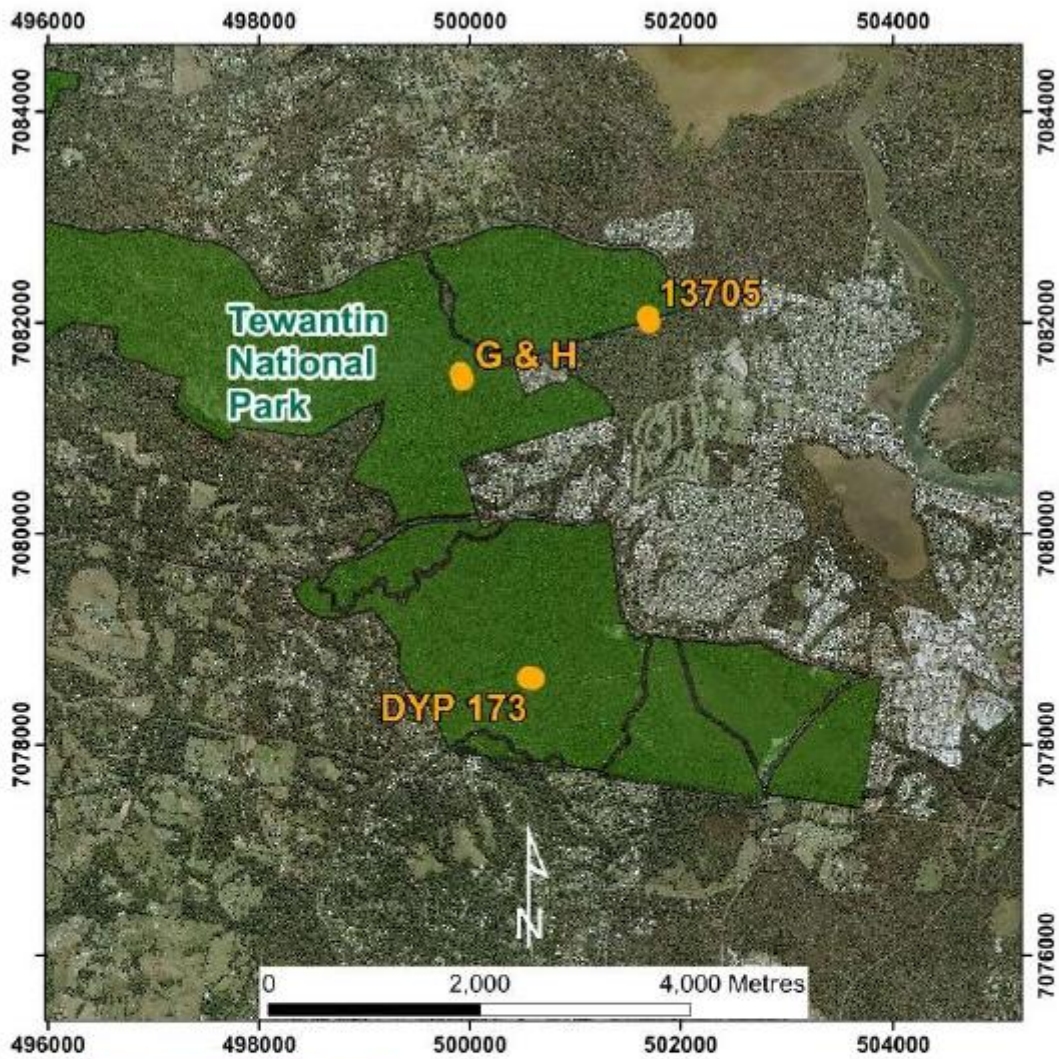


Non-native species cover



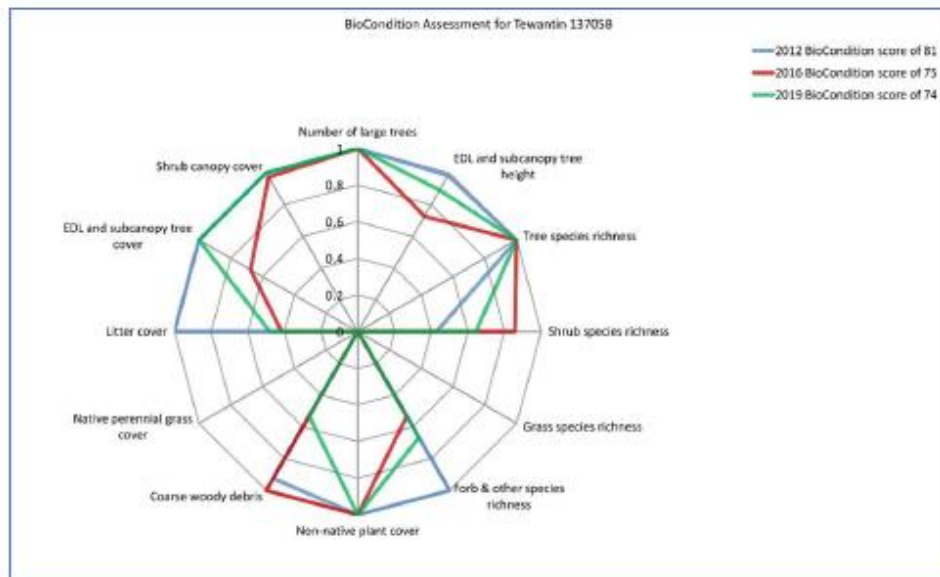
Number of non-native species

General comments: The trail-edge zone has the only cover and richness of non-native species, and the influence of non-native species increased over the time of sampling. To broaden the fire break, vegetation was cleared and chipped along the road prior to the 2016 sampling. The only non-native species with significant cover was the grass *Paspalum mandiocanum*. It is likely that this species was introduced in the track broadening process.



SEQ Monitoring Report Card
Tewantin 13705B
Regional Ecosystem 12.5.6c
Eucalyptus robusta, *E. pilularis*
Lophostemon confertus, *Syncarpia glomulifera* open forest
Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 81 2016 – 75 2019 – 74
 Fire History: no known fires



Forest monitoring transect September 2016 Forest monitoring transect September 2019

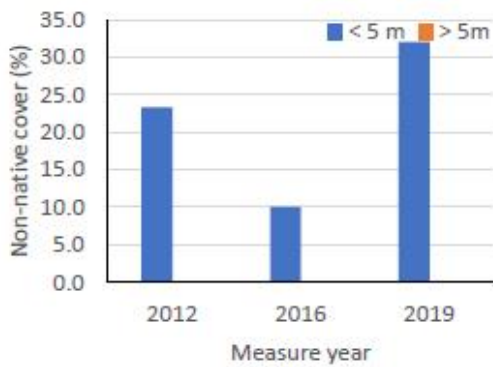
General Comments: This site consistently had a relatively high BioCondition score. Native perennial grasses were absent and hence the low scores for this attribute and grass species richness relative to the benchmark. No non-native species were recorded in the QBEIS site.

Trail-edge ground cover transect at Tewantin 13705B

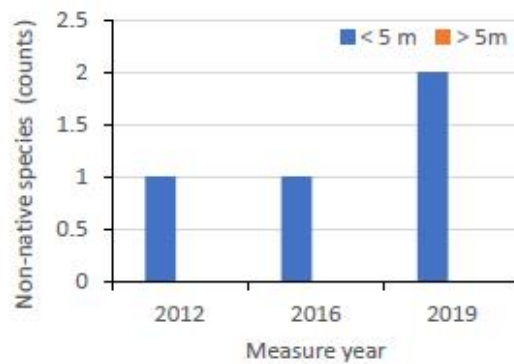


Trail-edge transect September 2016

Trail-edge transect September 2019

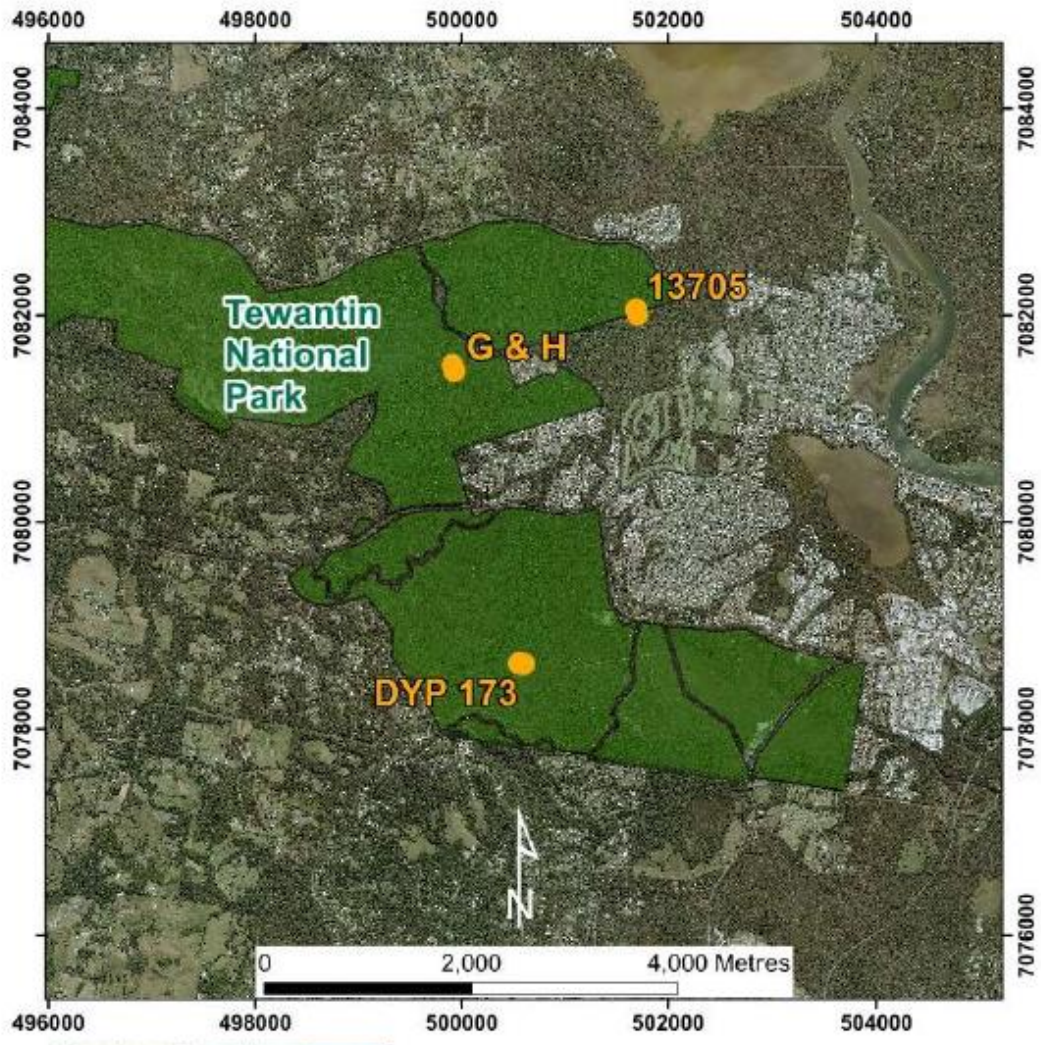


Non-native species cover

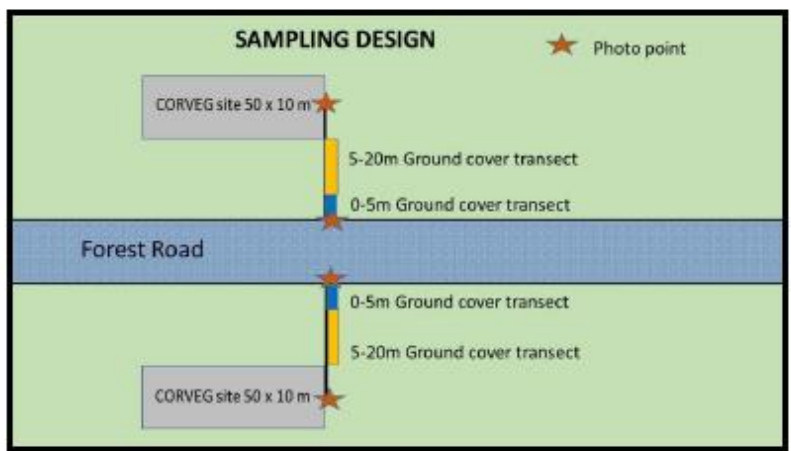
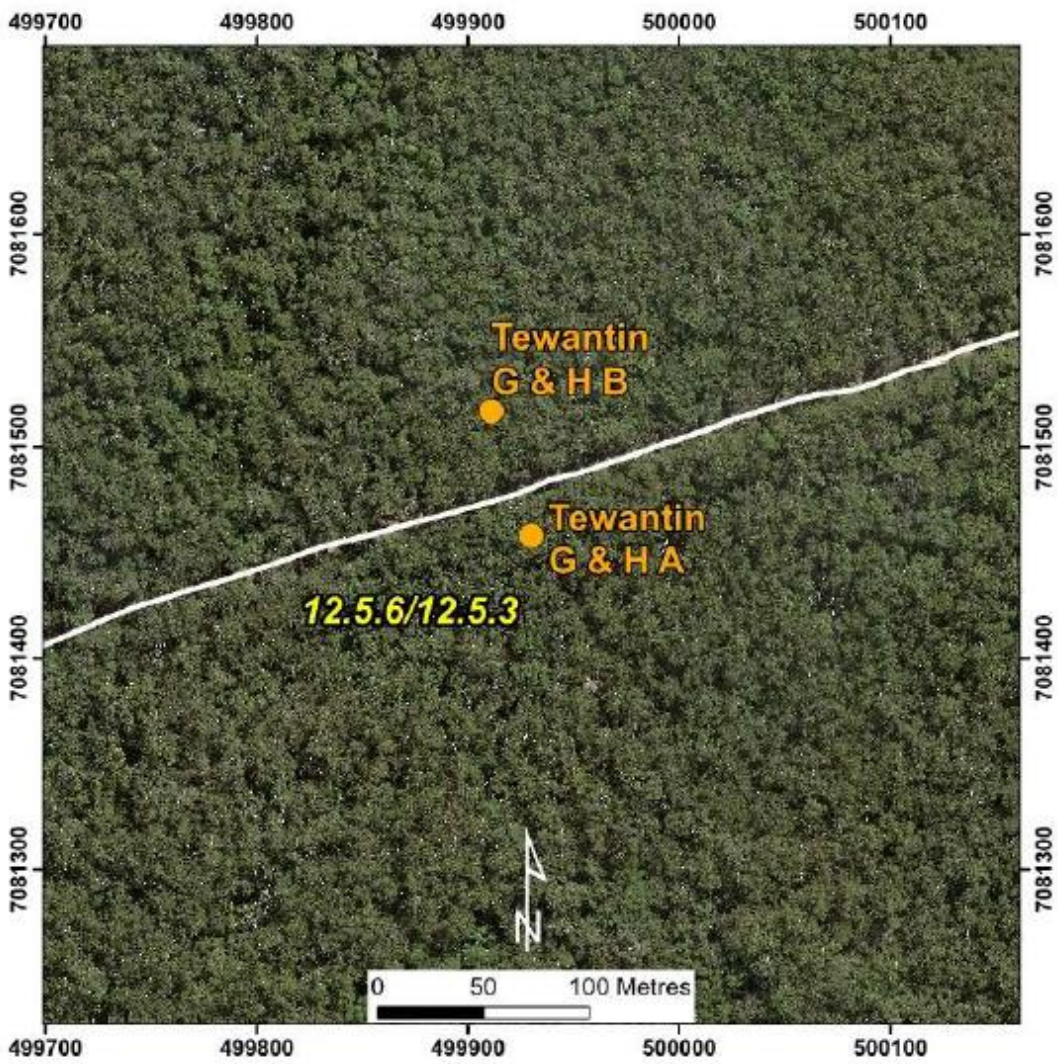


Number of non-native species

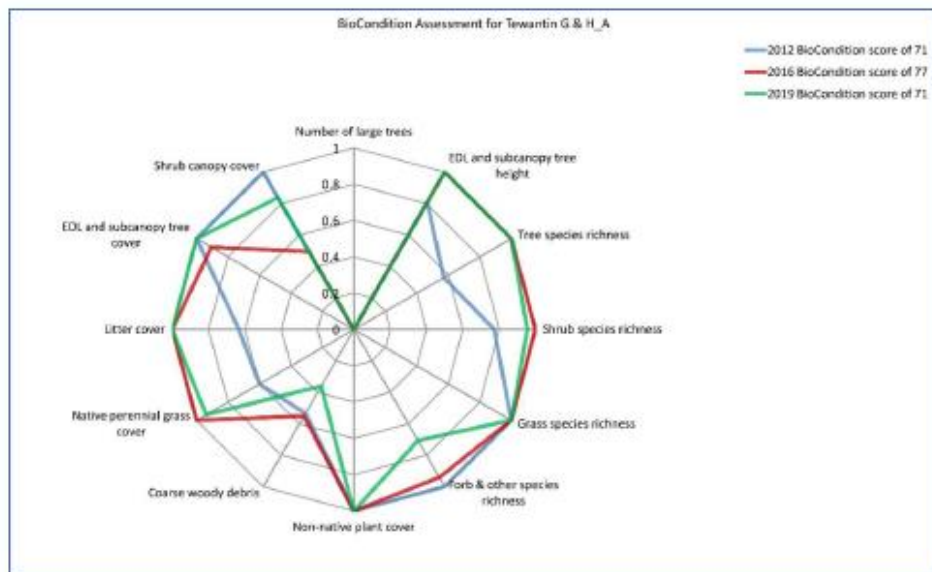
General comments: The trail-edge has the only cover and richness of non-native species, and the influence of non-native species increased over the time of sampling. To broaden the fire break, vegetation was cleared and chipped along the road prior to the 2016 sampling. The only non-native species with significant cover was the grass *Paspalum mandiocanum*. *Cyperus brevifolius* was present in low cover at the track edge in 2019.



SEQ Monitoring Report Card
Tewantin G&HA
Regional Ecosystem 12.9-10.1x1
Eucalyptus resinifera, *Corymbia intermedia*, *Syncarpia glomulifera*, *Lophostemon confertus* tall open forest
Queensland Herbarium, October 2021



QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 71 2016 – 77 2019 – 71
 Fire History: No fire data



Forest monitoring transect September 2016 Forest monitoring transect September 2019

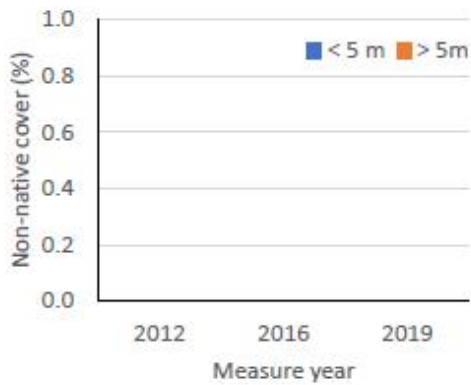
General Comments: This site consistently had a moderate BioCondition score. There were no large trees > 59 cm diameter to meet the benchmark threshold as a result of past logging history and consequently low levels of coarse woody debris. There were no non-native species recorded in the QBEIS site. The RE 12.9-10.1x1 is recognised as occurring on land zone 5 highly weathered surface.

Trail-edge ground cover transect at Tewantin G&HA

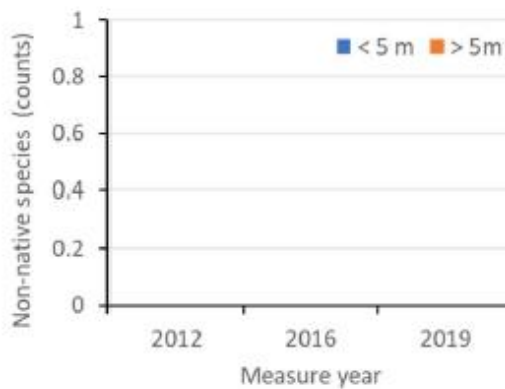


Trail-edge transect September 2016

Trail-edge transect September 2019

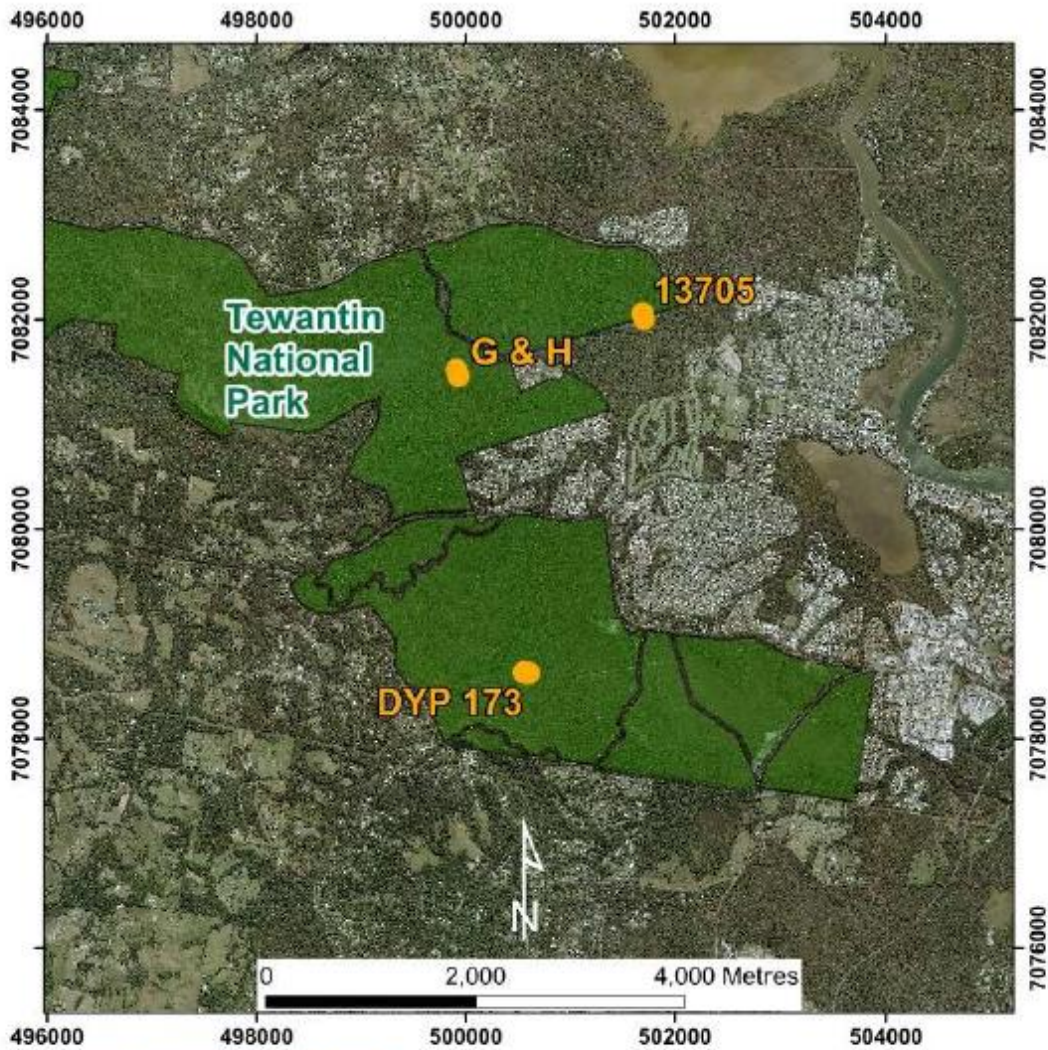


Non-native species cover



Number of non-native species

General comments: To broaden the fire break, vegetation was cleared and chipped along the road prior to the 2016 sampling. There were no non-native species recorded in the trail edge transect or in the QBEIS site.



SEQ Monitoring Report Card

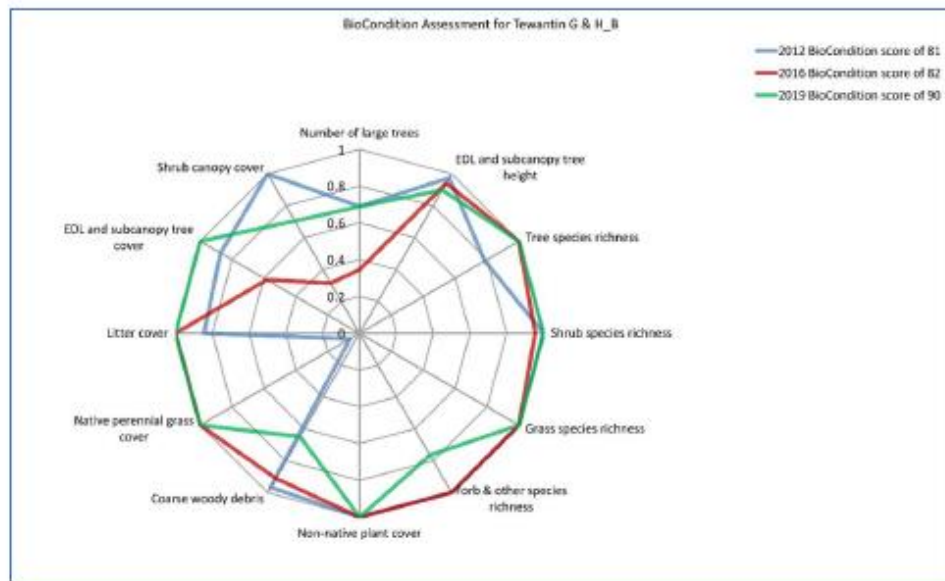
Tewantin G&HB

Regional Ecosystem 12.9-10.1x1

Eucalyptus resinifera, Eucalyptus grandis, Corymbia intermedia, Syncarpia glomulifera tall open forest

Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 81 2016 – 82 2019 – 90
 Fire History: Burnt August 2013



Forest monitoring transect September 2016 Forest monitoring transect September 2019

General Comments: This site consistently had a high BioCondition score. There were some large trees present and high levels of coarse woody debris. The native perennial grass cover increased and shrub cover decreased after the 2013 fire. The RE is recognised as occurring on land zone 5 highly weathered surface.

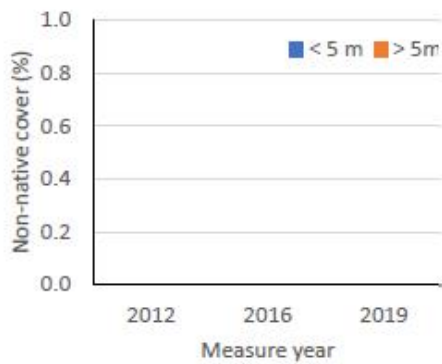
Trail-edge ground cover transect at Tewantin G&HB



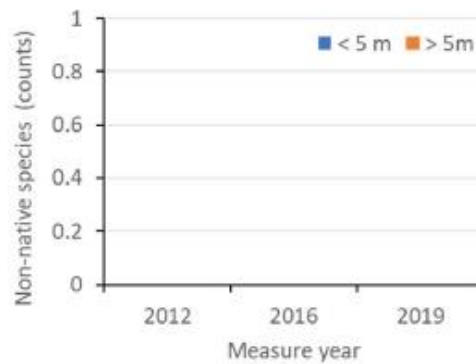
Trail-edge transect September 2016



Trail-edge transect September 2019



Non-native species cover



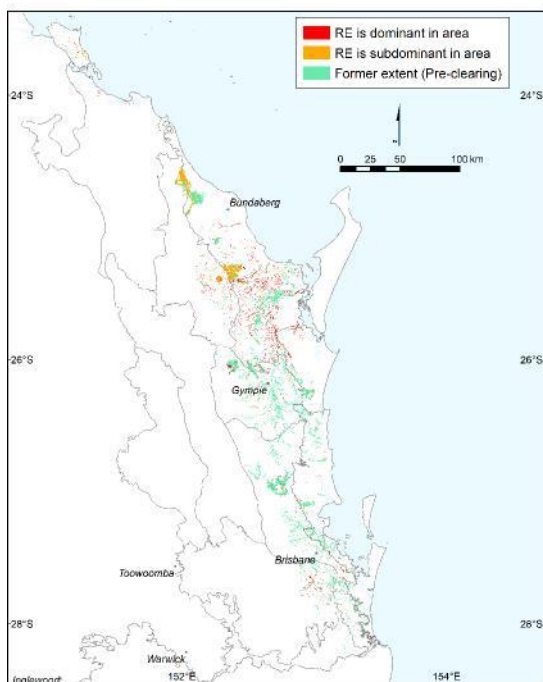
Number of non-native species

General comments: To broaden the fire break, vegetation was cleared and chipped along the road prior to the 2016 sampling. There were no non-native species recorded in the trail edge transect or in the QBEIS site.

Appendix II. Technical Descriptions and Benchmarks

Please note that the [Technical Descriptions](#) and [Benchmarks](#) provided here are accurate at the time of publication of this report but may be subject to change over time as new data becomes available. Please refer to the relevant Departmental webpages to ensure you are accessing the most recent versions.

12.3.11: *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast



Mapping data	Pre-clearing area = 162,939.4 ha; Remnant area 2019 = 40,389.7 ha; Remnant percent remaining in 2019 = 24.8 %
Species richness	total: 336 (34 sites); woody: 96 (34 sites); ground: 233 (18 sites); average spp./site: 39.7, standard deviation: 9.2 (18 sites)
Basal area	average/site: 20.6 m ² /ha; range: 6.0 - 31.0 m ² /ha; std. deviation: 5.5; (33 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 23.59m; range: 17.00 - 34.00m; (34 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 44.9%; range: 5.0 - 82.0%; (34 sites)
Structural formation	Woodland: 50.0 %; Open Forest: 32.4 %; Open Woodland: 8.8 %; Tall Woodland: 8.8 %; (34 sites)
Representative site(s)	1943, 2044, 2297, 2363, 2464, 2511, 2787, 2971, 2972, 3029, 3031, 3965, 5018, 5038, 5377, 6688, 8337, 8489, 8518, 9583, 10236, 11915, 12844, 13558, 13560, 13568, 13705, 13824, 13973, 14208, 16072, 16741, 16743, 17232

Stratum: Tree 1 (EDL)

Height: average: 23.59m; range: 17.00 - 34.00m; (34 sites)

Crown Cover: average: 44.9%; range: 5.0 - 82.0%; (34 sites)

Stem Count: average: 342 stems/ha; range: 20 - 1,000 stems/ha; std. deviation: 243.5 stems/ha; (15 sites)

Basal area: average: 13.2 m²/ha; range: 3.0 - 26.0 m²/ha; std. deviation: 5.9 m²/ha; (32 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Eucalyptus tereticornis (79.4, 20.7), *Corymbia intermedia* (64.7, 14.4), *Eucalyptus siderophloia* (61.8, 10.8), *Lophostemon suaveolens* (38.2, 12.6), *Angophora leiocarpa* (23.5, 6.0), *Melaleuca quinquenervia* (17.6, 15.8)

Additional species:

Corymbia tessellaris (14.7, 10.8), *Eucalyptus exserta* (14.7, 4.7), *Corymbia citriodora subsp. variegata* (11.8, 9.3), *Corymbia trachyphloia subsp. trachyphloia* (8.8, 3.7), *Eucalyptus crebra* (8.8, 3.5), *Eucalyptus tindaliae* (5.9, 1.5), *Eucalyptus resinifera* (2.9, 22.0), *Angophora woodsiana* (2.9, 18.0), *Eucalyptus seeana* (2.9, 5.0), *Casuarina cunninghamiana subsp. cunninghamiana* (2.9, 3.0), *Eucalyptus acmenoides* (2.9, 3.0), *Eucalyptus carnea* (2.9, 0.5), *Dendrophthoe vitellina* (2.9, 0.0), *Eucalyptus fibrosa subsp. Fibrosa* (2.9, 0.0), *Syncarpia glomulifera subsp. glomulifera* (2.9, 0.0), *Toona ciliata* (2.9, 0.0)

Stratum: Tree 2

Height: average: 11.46m; range: 7.00 - 18.00m; (34 sites)

Crown Cover: average: 23.6%; range: 1.0 - 70.0%; (34 sites)

Stem Count: average: 632 stems/ha; range: 20 - 2,000 stems/ha; std. deviation: 608.2 stems/ha; (15 sites)

Basal area: average: 8.5 m²/ha; range: 1.0 - 26.0 m²/ha; std. deviation: 6.8 m²/ha; (27 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Lophostemon suaveolens (76.5, 9.4), *Melaleuca quinquenervia* (55.9, 12.4), *Corymbia intermedia* (44.1, 4.9), *Eucalyptus tereticornis* (23.5, 5.8), *Eucalyptus siderophloia* (23.5, 3.7), *Acacia disparrima subsp. disparrima* (17.6, 4.0)

Additional species:

Alphitonia excelsa (17.6, 2.0), *Angophora leiocarpa* (14.7, 3.5), *Allocasuarina littoralis* (11.8, 5.8), *Glochidion sumatranum* (8.8, 9.0), *Corymbia tessellaris* (8.8, 3.0), *Melaleuca salicina* (5.9, 13.5), *Banksia integrifolia* (5.9, 5.5), *Casuarina glauca* (5.9, 5.0), *Glochidion ferdinandi var. ferdinandi* (5.9, 5.0), *Melaleuca linariifolia* (5.9, 3.5), *Acacia concurrens* (5.9, 2.8), *Eucalyptus exserta* (5.9, 2.0), *Parsonia straminea* (5.9, 1.0), *Acacia melanoxylon* (5.9, 0.5), *Elaeocarpus obovatus* (5.9, 0.0), *Notelaea longifolia* (5.9, 0.0), *Eucalyptus tindaliae* (2.9, 7.0), *Acacia fimbriata* (2.9, 5.0), *Acacia leiocalyx subsp. leiocalyx* (2.9, 5.0), *Corymbia trachyphloia subsp. trachyphloia* (2.9, 5.0), *Ficus coronata* (2.9, 5.0), *Melaleuca viridiflora* (2.9, 5.0), *Waterhousea floribunda* (2.9, 5.0), *Allocasuarina torulosa* (2.9, 4.0), *Cinnamomum camphora** (2.9, 1.0), *Pinus elliotii** (2.9, 1.0), *Aegiceras corniculatum* (2.9, 0.0), *Angophora woodsiana* (2.9, 0.0), *Avicennia marina subsp. australasica* (2.9, 0.0), *Bruguiera gymnorhiza* (2.9, 0.0), *Dendrophthoe vitellina* (2.9, 0.0), *Hibiscus tiliaceus* (2.9, 0.0), *Jagera pseudorhus var. pseudorhus* (2.9, 0.0), *Lophostemon confertus* (2.9, 0.0), *Melaleuca styphelioides* (2.9, 0.0), *Syncarpia glomulifera subsp. glomulifera* (2.9, 0.0), *Xylocarpus granatum* (2.9, 0.0)

Stratum: Tree 3

Height: average: 6.94m; range: 5.00 - 8.50m; (8 sites)

Crown Cover: average: 25.8%; range: 10.0 - 55.0%; (8 sites)

Stem Count: average: 1,376 stems/ha; range: 1,376 - 1,376 stems/ha; std. deviation: 0.0 stems/ha; (1 site)

Basal area: average: 2.0 m²/ha; range: 2.0 - 2.0 m²/ha; std. deviation: 0.0 m²/ha; (2 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Lophostemon suaveolens (20.6, 10.6), *Melaleuca quinquenervia* (14.7, 8.5), *Glochidion sumatranum* (8.8, 5.8), *Acacia disparrima subsp. disparrima* (5.9, 8.5), *Corymbia intermedia* (5.9, 2.0), *Acacia melanoxylon* (2.9, 10.0)

Additional species:

Lophostemon confertus (2.9, 10.0), *Elaeocarpus reticulatus* (2.9, 9.0), *Allocasuarina torulosa* (2.9, 6.0), *Waterhousea floribunda* (2.9, 6.0), *Acacia leiocalyx subsp. leiocalyx* (2.9, 5.0), *Angophora leiocarpa* (2.9, 5.0), *Banksia integrifolia subsp. compar* (2.9, 5.0), *Angophora subvelutina* (2.9, 3.0), *Eucalyptus tereticornis* (2.9, 3.0), *Allocasuarina littoralis* (2.9, 0.0), *Symplocos stawellii* (2.9, 0.0)

Stratum: Shrub 1

Height: average: 2.72m; range: 0.80 - 5.00m; (32 sites)

Crown Cover: average: 20.5%; range: 1.6 - 83.5%; (32 sites)

Stem Count: average: 2,302 stems/ha; range: 10 - 10,800 stems/ha; std. deviation: 2,866.7 stems/ha; (17 sites)

Basal area: average: 2.5 m²/ha; range: 1.0 - 5.0 m²/ha; std. deviation: 1.3 m²/ha; (10 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Acacia disparrima subsp. disparrima (47.1, 5.2), *Acacia leiocalyx subsp. leiocalyx* (44.1, 6.3), *Lophostemon suaveolens* (41.2, 5.4), *Alphitonia excelsa* (38.2, 3.8), *Lantana camara** (32.4, 13.4), *Melaleuca quinquenervia* (26.5, 9.0)

Additional species: *Eucalyptus tereticornis* (14.7, 0.5), *Leptospermum polygalifolium* (11.8, 26.0), *Baccharis halimifolia** (11.8, 16.5), *Glochidion sumatranum* (11.8, 3.6), *Corymbia intermedia* (11.8, 0.0), *Allocasuarina littoralis* (8.8, 5.0), *Acacia concurrens* (8.8, 1.5), *Cinnamomum camphora** (8.8, 1.0), *Hakea florulenta* (8.8, 0.5), *Corymbia tessellaris* (8.8, 0.0), *Glochidion ferdinandi var. ferdinandi* (8.8, 0.0), *Lophostemon confertus* (5.9, 9.0), *Angophora leiocarpa* (5.9, 2.0), *Persoonia stradbrokeensis* (5.9, 2.0), *Maclura cochinchinensis* (5.9, 1.0), *Parsonia straminea* (5.9, 1.0), *Senna pendula var. glabrata** (5.9, 1.0), *Trema tomentosa* (5.9, 1.0),

Acacia maidenii (5.9, 0.0), *Banksia integrifolia* (5.9, 0.0), *Breynia oblongifolia* (5.9, 0.0), *Clerodendrum floribundum* (5.9, 0.0), *Melaleuca salicina* (5.9, 0.0), *Acacia flavescens* (2.9, 10.0), *Casuarina glauca* (2.9, 6.0), *Acacia falcata* (2.9, 5.0), *Melaleuca linariifolia* (2.9, 3.0), *Eucalyptus tindaliae* (2.9, 2.0), *Ligustrum sinense** (2.9, 1.0), *Murraya paniculata* 'Exotica'* (2.9, 1.0), *Pittosporum revolutum* (2.9, 1.0), *Stephania japonica* (2.9, 1.0), *Grevillea banksii* (2.9, 0.6), *Elaeocarpus reticulatus* (2.9, 0.4), *Solanum chrysotrichum** (2.9, 0.2), *Solanum mauritianum** (2.9, 0.2), *Wikstroemia indica* (2.9, 0.2), *Acacia fimbriata* (2.9, 0.0), *Acacia melanoxylon* (2.9, 0.0), *Archontophoenix cunninghamiana* (2.9, 0.0), *Asparagus africanus** (2.9, 0.0), *Austromyrtus dulcis* (2.9, 0.0), *Dodonaea triquetra* (2.9, 0.0), *Endiandra sieberi* (2.9, 0.0), *Eucalyptus crebra* (2.9, 0.0), *Eucalyptus siderophloia* (2.9, 0.0), *Grevillea robusta* (2.9, 0.0), *Hovea acutifolia* (2.9, 0.0), *Livistona australis* (2.9, 0.0), *Melastoma malabathricum* subsp. *malabathricum* (2.9, 0.0), *Myrsine variabilis* (2.9, 0.0), *Ochna serrulata** (2.9, 0.0), *Pinus elliotii** (2.9, 0.0), *Psychdrax odorata* (2.9, 0.0), *Pultenaea paleacea* (2.9, 0.0), *Sida hackettiana* (2.9, 0.0), *Sida rhombifolia** (2.9, 0.0), *Syagrus romanzoffiana** (2.9, 0.0), *Symplocos stawellii* (2.9, 0.0), *Trophis scandens* subsp. *scandens* (2.9, 0.0)

Stratum: Shrub 2

Height: average: 1.20m; range: 1.20 - 1.20m; (1 site)

Crown Cover: No data available.

Stem Count: No data available.

Basal area: No data available.

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Acrotriche aggregata (2.9, 0.0), *Carissa ovata* (2.9, 0.0),

Additional species:

Stratum: Ground

Height: average: 0.62m; range: 0.20 - 1.00m; (18 sites)

Projective foliage cover (PFC): average: 49.5%; range: 9.2 - 96.0%; (18 sites)

Species list (frequency (%), average cover (%)):

Grass - perennial:

Most frequent species (up to 6):

Imperata cylindrica (94.4, 21.6), *Themeda triandra* (72.2, 15.3), *Entolasia stricta* (44.4, 5.3), *Cymbopogon refractus* (33.3, 4.6),

Ottochloa gracillima (33.3, 19.1), *Paspalum scrobiculatum* (33.3, 0.2)

Additional species:

Eragrostis spartinoides (27.8, 2.0), *Microlaena stipoides* (27.8, 8.0), *Panicum effusum* (27.8, 0.6), *Alloteropsis semialata* (16.7, 0.0), *Arundinella nepalensis* (16.7, 15.7), *Capillipedium spicigerum* (16.7, 2.0), *Digitaria parviflora* (16.7, 0.0), *Eremochloa bimaculata* (16.7, 7.8), *Oplismenus aemulus* (16.7, 2.0), *Paspalidium distans* (16.7, 0.0), *Paspalidium gausum* (16.7, 1.0), *Aristida warburgii* (11.1, 0.0), *Chloris gayana** (11.1, 0.0), *Dichelachne micrantha* (11.1, 0.0), *Eragrostis brownii* (11.1, 0.0), *Panicum simile* (11.1, 0.0), *Paspalidium gracile* (11.1, 2.5), *Sacciolepis indica* (11.1, 1.5), *Aristida calycina* var. *calycina* (5.6, 0.0), *Chrysopogon fallax* (5.6, 0.0), *Chrysopogon sylvaticus* (5.6, 3.1), *Cynodon dactylon** (5.6, 0.0), *Dichelachne** (5.6, 0.0), *Digitaria* (5.6, 0.0), *Digitaria breviglumis* (5.6, 0.0), *Digitaria didactyla** (5.6, 0.0), *Digitaria longiflora* (5.6, 0.0), *Echinochloa telmatophila* (5.6, 0.0), *Eragrostis* (5.6, 0.6), *Eriochloa procera* (5.6, 0.0), *Heteropogon contortus* (5.6, 1.0), *Leptochloa* (5.6, 0.0), *Megathyrus maximus** (5.6, 12.0), *Megathyrus maximus* var. *maximus** (5.6, 0.0), *Oplismenus imbecillis* (5.6, 0.0), *Ottochloa nodosa* (5.6, 0.0), *Paspalum dilatatum** (5.6, 0.0), *Poa sieberiana* (5.6, 25.0), *Sarga leiocladum* (5.6, 27.0), *Setaria sphacelata** (5.6, 2.0), *Urochloa mutica** (5.6, 2.0)

Grass - annual/biennial:

Most frequent species (up to 6):

*Eragrostis cilianensis** (5.6, 0.0),

Additional species:

Forbs & other:

Most frequent species (up to 6):

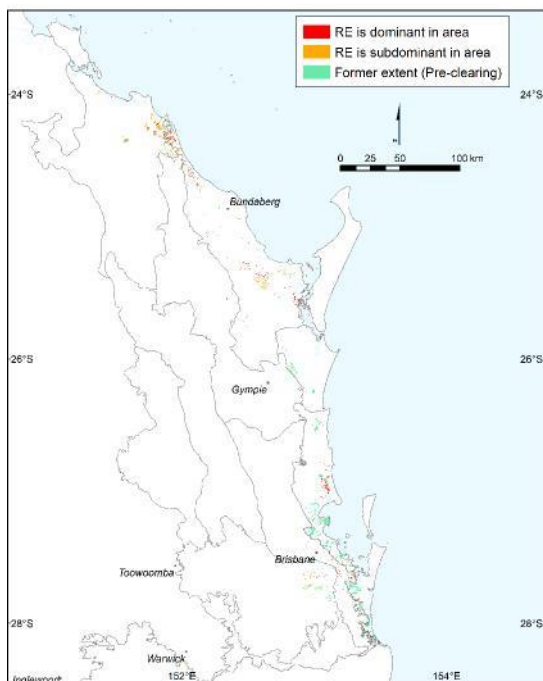
Cyanthillium cinereum (72.2, 0.2), *Lobelia purpurascens* (72.2, 2.3), *Passiflora suberosa** (50.0, 0.8), *Brunoniella australis* (44.4, 0.0), *Dianella caerulea* (44.4, 0.0), *Lomandra longifolia* (44.4, 4.4)

Additional species:

Parsonia straminea (44.4, 4.0), *Phyllanthus virgatus* (44.4, 0.0), *Centella asiatica* (38.9, 0.0), *Geitonoplesium cymosum* (38.9, 0.0), *Desmodium rhytidophyllum* (33.3, 0.0), *Eustrephus latifolius* (33.3, 0.0), *Murdannia graminea* (33.3, 0.0), *Ageratum houstonianum** (27.8, 0.0), *Goodenia rotundifolia* (27.8, 0.0), *Polymeria calycina* (27.8, 0.0), *Fimbristylis dichotoma* (22.2, 0.0), *Glycine clandestina* var. *clandestina* (22.2, 0.0), *Lantana camara** (22.2, 19.0), *Lomandra laxa* (22.2, 2.8), *Pteridium esculentum* (22.2, 4.7), *Stephania japonica* (22.2, 0.0), *Acacia disparrima* subsp. *disparrima* (16.7, 0.0), *Alphitonia excelsa* (16.7, 0.0), *Bidens pilosa** (16.7, 1.0), *Cassytha pubescens* (16.7, 0.0), *Commelina lanceolata* (16.7, 0.0), *Dianella revoluta* var. *revoluta* (16.7, 0.0), *Emilia sonchifolia** (16.7, 0.0), *Gahnia aspera* (16.7, 3.0), *Glochidion ferdinandi* var. *ferdinandi* (16.7, 0.0), *Glochidion sumatranum* (16.7, 0.0), *Gomphocarpus physocarpus** (16.7, 0.0), *Lepidosperma laterale* (16.7, 0.6), *Lomandra multiflora* subsp. *multiflora* (16.7, 5.4), *Pimelea linifolia* (16.7, 2.0), *Smilax australis* (16.7, 0.0), *Solanum seaforthianum** (16.7, 0.0), *Tricoryne elatior* (16.7, 0.0), *Asclepias curassavica** (11.1, 0.0), *Chrysocephalum apiculatum* (11.1, 0.0), *Crassocephalum crepidioides** (11.1, 0.0), *Cupaniopsis anacardioides* (11.1, 0.0), *Cyperus leiocaulon* (11.1, 0.0), *Dianella rara* (11.1, 0.0), *Flemingia parviflora* (11.1, 1.0), *Galactia tenuiflora* (11.1, 0.0), *Lomandra confertifolia* subsp. *pallida* (11.1, 0.0), *Lophostemon suaveolens* (11.1, 0.4), *Maclura cochinchinensis* (11.1, 0.0), *Melastoma malabathricum* subsp. *malabathricum* (11.1, 0.0), *Ochna serrulata** (11.1, 0.0), *Oxalis* (11.1, 0.0), *Passiflora foetida** (11.1, 0.0), *Pigea stellarioides* (11.1, 0.0), *Pseuderanthemum variabile* (11.1, 1.0), *Pycnospora lutescens* (11.1, 0.0), *Scleria levis* (11.1, 0.0), *Sida rhombifolia** (11.1, 0.0), *Sigesbeckia orientalis* (11.1, 0.0), *Solanum nigrum** (11.1, 0.0), *Telmatoblechnum indicum* (11.1, 0.0), *Acacia concurrens* (5.6, 0.0), *Acacia leiocalyx* subsp. *leiocalyx* (5.6, 0.0), *Acacia maidenii* (5.6, 0.0), *Acacia melanoxylon* (5.6, 1.0), *Acronychia imperforata* (5.6, 0.0), *Ambrosia artemisiifolia** (5.6, 0.0), *Aristolochia meridionalis* (5.6, 0.0), *Asparagus* (5.6, 1.0), *Asparagus africanus** (5.6, 0.0), *Austromyrtus dulcis* (5.6, 0.6), *Baloskion pallens* (5.6, 0.0), *Baumea* (5.6, 1.0), *Breynia oblongifolia* (5.6, 0.0), *Brunoniella acaulis* (5.6, 0.0), *Caladenia catenata* (5.6, 0.0), *Calochlaena dubia* (5.6, 5.0), *Carex* (5.6, 0.0), *Carex brunnea* (5.6, 0.0), *Carissa ovata* (5.6, 0.0), *Cassytha filiformis* (5.6, 1.0), *Casuarina** (5.6, 0.0), *Causonis clematidea* (5.6, 0.0), *Chamaecrista nomame* (5.6, 0.0), *Cheilanthes sieberi* (5.6, 0.0), *Cheilanthes sieberi* subsp. *sieberi* (5.6, 0.0), *Chorizema parviflorum* (5.6, 0.0), *Commelina diffusa* (5.6, 0.0), *Convolvulus arvensis** (5.6, 0.0), *Corybas barbarae* (5.6, 1.0), *Corymbia tessellaris* (5.6, 0.0), *Corymbia torelliana* (5.6, 0.0), *Crotalaria montana* (5.6, 0.0), *Curculigo ensifolia* var. *ensifolia* (5.6, 0.0), *Cyclophyllum coprosmoides* (5.6, 0.0), *Cyperus haspan* (5.6, 0.0), *Cyperus sesquiflorus** (5.6, 0.0), *Daviesia umbellulata* (5.6, 0.0), *Desmodium gunnii* (5.6, 0.0), *Desmodium varians* (5.6, 0.0), *Dianella brevipedunculata* (5.6, 0.0), *Dianella caerulea* var. *caerulea* (5.6, 0.0), *Dichondra repens* (5.6, 0.0), *Einadia hastata* (5.6, 0.0), *Elaeocarpus reticulatus* (5.6, 1.0), *Endiandra muelleri* subsp. *muelleri* (5.6, 1.2), *Epacris microphylla* (5.6, 0.0), *Erigeron bonariensis** (5.6, 0.0), *Eriocaulon australe* (5.6, 1.0), *Eucalyptus tereticornis* (5.6, 0.0), *Ficus rubiginosa* (5.6, 0.0), *Fimbristylis cinnamometorum* (5.6, 0.0), *Fimbristylis vaginata* (5.6, 0.0), *Geodorum densiflorum* (5.6, 0.0), *Glossocardia bidens* (5.6, 0.0), *Glycine clandestina* var. *sericea* (5.6, 0.0), *Glycine tomentella* (5.6, 0.0), *Gonocarpus chinensis* subsp. *verrucosus* (5.6, 0.0), *Gonocarpus micranthus* subsp. *ramosissimus* (5.6, 0.0), *Goodenia bellidifolia* subsp. *argentea* (5.6, 0.0), *Goodenia mystrophylla* (5.6, 0.0), *Grevillea leiophylla* (5.6, 0.0), *Hakea florulenta* (5.6, 0.0), *Haloragis heterophylla* (5.6, 0.0), *Heptapleurum actinophyllum* (5.6, 0.0), *Hibbertia scandens* (5.6, 0.0), *Hydrocotyle acutiloba* (5.6, 0.0), *Hydrocotyle tripartita* (5.6, 2.0), *Hypericum gramineum* (5.6, 0.0), *Hypoxis arillacea* (5.6, 0.0), *Hypoxis pratensis* (5.6, 0.0), *Jacaranda mimosifolia** (5.6, 0.0), *Jacksonia scoparia* (5.6, 0.0), *Jagera pseudorhus* (5.6, 0.0), *Juncus polyanthemus* (5.6, 0.0), *Lagenophora stipitata* (5.6, 0.0), *Ligustrum sinense** (5.6, 0.0), *Lindsaea dimorpha* (5.6, 1.4), *Lindsaea incisa* (5.6, 0.0), *Lomandra confertifolia* (5.6, 3.0), *Lomandra filiformis* (5.6, 0.0), *Lomatia silaifolia* (5.6, 0.0), *Machaerina articulata* (5.6, 0.0), *Macrotyloma axillare* var. *axillare** (5.6, 0.0), *Melaleuca linariifolia* (5.6, 0.0), *Mitrasacme alsinoides* (5.6, 0.0), *Notelaea ovata* (5.6, 0.0), *Oxalis corniculata** (5.6, 0.0), *Oxalis exilis* (5.6, 0.0), *Oxalis perennans* (5.6, 0.0), *Pandorea pandorana* (5.6, 0.0), *Passiflora subpeltata** (5.6, 0.0), *Persoonia media* (5.6, 0.0), *Petalostigma pubescens* (5.6, 0.0), *Pittosporum revolutum* (5.6, 0.0), *Polygala paniculata** (5.6, 0.0), *Poranthera microphylla* (5.6, 0.0), *Pterostylis nutans* (5.6, 0.0), *Pultenaea spinosa* (5.6, 0.0), *Richardia brasiliensis** (5.6, 0.0), *Rivina humilis** (5.6, 3.0), *Rostellularia adscendens* (5.6, 0.0), *Rostellularia obtusa* (5.6, 0.0), *Rubus parvifolius* (5.6, 0.0), *Schinus terebinthifolius** (5.6, 0.0), *Schoenus apogon* (5.6, 5.0), *Schoenus apogon* var. *apogon* (5.6, 0.0), *Scleria mackaviensis* (5.6, 1.0), *Scleria terrestris* (5.6, 0.0), *Senna pendula* var. *glabrata** (5.6, 0.0), *Smilax glyciophylla* (5.6, 0.0), *Solanum americanum** (5.6, 0.0), *Solanum mauritianum** (5.6, 0.0), *Solanum stelligerum* (5.6, 0.0), *Sonchus oleraceus** (5.6, 0.0), *Sporadanthus caudatus* (5.6, 10.0), *Tagetes minuta** (5.6, 0.0), *Torenia crustacea* (5.6, 0.0), *Trophis scandens* subsp. *scandens* (5.6, 0.0), *Verbena* (5.6, 0.0), *Viola banksii* (5.6, 0.0), *Viola hederacea* (5.6, 0.0), *Wikstroemia indica* (5.6, 0.0), *Zieria minutiflora* subsp. *minutiflora* (5.6, 0.4)

Species list: Frequency (percent of total sites) and cover (average of species cover across sites where that species is present). Ordered by decreasing frequency. Naturalised species have an asterisk (*) after the name. indet. after listed name if indeterminate species or genus.

12.3.6: *Melaleuca quinquenervia* +/- *Eucalyptus tereticornis*, *Lophostemon suaveolens*, *Corymbia intermedia* open forest on coastal alluvial plains



Mapping data	Pre-clearing area = 31,394.0 ha; Remnant area 2019 = 12,304.1 ha; Remnant percent remaining in 2019 = 39.2 %
Species richness	total: 281 (23 sites); woody: 82 (23 sites); ground: 195 (17 sites); average spp./site: 29.9, standard deviation: 10.7 (17 sites)
Basal area	average/site: 29.4 m ² /ha; range: 5.0 - 63.5 m ² /ha; std. deviation: 12.1; (23 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 16.35m; range: 11.00 - 27.00m; (23 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 59.9%; range: 18.0 - 91.0%; (23 sites)
Structural formation	Open Forest: 47.8 %; Woodland: 26.1 %; Closed Forest: 17.4 %; Open Woodland: 4.3 %; Tall Open Forest: 4.3 %; (23 sites)
Representative site(s)	1991, 2530, 2873, 3099, 3224, 3342, 3406, 3470, 5011, 6668, 8343, 9237, 9506, 9516, 9523, 10414, 10617, 10626, 13551, 13791, 14308, 16751, 17216

Stratum: Emergent

Height: average: 25.29m; range: 20.00 - 32.00m; (7 sites)

Crown Cover: average: 5.9%; range: 0.0 - 10.0%; (7 sites)

Stem Count: average: 100 stems/ha; range: 40 - 140 stems/ha; std. deviation: 52.9 stems/ha; (3 sites)

Basal area: average: 3.3 m²/ha; range: 1.0 - 6.0 m²/ha; std. deviation: 2.2 m²/ha; (6 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Eucalyptus tereticornis (30.4, 6.5), *Corymbia intermedia* (8.7, 2.0),

Additional species:

Stratum: Tree 1 (EDL)

Height: average: 16.35m; range: 11.00 - 27.00m; (23 sites)

Crown Cover: average: 59.9%; range: 18.0 - 91.0%; (23 sites)

Stem Count: average: 1,253 stems/ha; range: 180 - 2,640 stems/ha; std. deviation: 782.5 stems/ha; (9 sites)

Basal area: average: 24.7 m²/ha; range: 5.0 - 62.0 m²/ha; std. deviation: 11.7 m²/ha; (23 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Melaleuca quinquenervia (95.7, 39.4), *Lophostemon suaveolens* (60.9, 16.8), *Eucalyptus tereticornis* (56.5, 10.4), *Corymbia intermedia* (52.2, 9.0), *Allocasuarina littoralis* (8.7, 17.5), *Parsonsia straminea* (8.7, 10.0)

Additional species:

Glochidion sumatranum (4.3, 24.0), *Lophostemon confertus* (4.3, 16.0), *Alphitonia excelsa* (4.3, 8.0), *Glochidion ferdinandi* var. *ferdinandi* (4.3, 8.0), *Eucalyptus exserta* (4.3, 2.0), *Eucalyptus microcorys* (4.3, 2.0), *Eucalyptus latisinensis* (4.3, 1.0), *Banksia integrifolia* (4.3, 0.0), *Eucalyptus resinifera* (4.3, 0.0), *Melaleuca salicina* (4.3, 0.0), *Melaleuca viridiflora* (4.3, 0.0)

Stratum: Tree 2

Height: average: 8.78m; range: 6.00 - 18.00m; (18 sites)

Crown Cover: average: 20.7%; range: 1.0 - 73.2%; (18 sites)

Stem Count: average: 479 stems/ha; range: 120 - 1,500 stems/ha; std. deviation: 513.1 stems/ha; (7 sites)

Basal area: average: 6.3 m²/ha; range: 1.5 - 16.0 m²/ha; std. deviation: 4.6 m²/ha; (13 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Lophostemon suaveolens (56.5, 10.9), *Melaleuca quinquenervia* (56.5, 10.5), *Corymbia intermedia* (17.4, 9.6), *Glochidion sumatranum* (17.4, 4.6), *Allocasuarina littoralis* (13.0, 23.5), *Alphitonia excelsa* (13.0, 10.0)

Additional species:

Acacia disparrima subsp. *disparrima* (8.7, 0.6), *Parsonsia straminea* (4.3, 10.0), *Acacia melanoxylon* (4.3, 6.0), *Melicope elleryana* (4.3, 2.0), *Acacia leiocalyx* subsp. *leiocalyx* (4.3, 1.0), *Eucalyptus siderophloia* (4.3, 1.0), *Livistona australis* (4.3, 1.0), *Pimelea linifolia* subsp. *linifolia* (4.3, 1.0), *Symplocos thwaitesii* (4.3, 1.0), *Dendrophthoe vitellina* (4.3, 0.0), *Lophostemon confertus* (4.3, 0.0), *Pinus elliotii** (4.3, 0.0)

Stratum: Tree 3

Height: average: 8.00m; range: 8.00 - 8.00m; (1 site)

Crown Cover: average: 40.2%; range: 40.2 - 40.2%; (1 site)

Stem Count: average: 1,040 stems/ha; range: 1,040 - 1,040 stems/ha; std. deviation: 0.0 stems/ha; (1 site)

Basal area: average: 1.0 m²/ha; range: 1.0 - 1.0 m²/ha; std. deviation: 0.0 m²/ha; (1 site)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Allocasuarina littoralis (4.3, 23.4), *Lophostemon suaveolens* (4.3, 8.8), *Glochidion ferdinandi* var. *ferdinandi* (4.3, 6.4), *Elaeocarpus reticulatus* (4.3, 1.6), *Acacia melanoxylon* (4.3, 0.0), *Billardiera scandens* (4.3, 0.0)

Additional species:

Symplocos stawellii (4.3, 0.0)

Stratum: Shrub 1

Height: average: 2.26m; range: 1.00 - 4.50m; (23 sites)

Crown Cover: average: 15.7%; range: 0.6 - 80.0%; (22 sites)

Stem Count: average: 469 stems/ha; range: 40 - 1,800 stems/ha; std. deviation: 617.1 stems/ha; (7 sites)

Basal area: average: 1.7 m²/ha; range: 1.0 - 3.0 m²/ha; std. deviation: 1.1 m²/ha; (3 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6): *Alphitonia excelsa* (39.1, 2.0), *Lantana camara** (30.4, 6.8), *Acacia leiocalyx* subsp. *leiocalyx* (30.4, 3.5), *Lophostemon suaveolens* (30.4, 3.1), *Acacia disparrima* subsp. *disparrima* (21.7, 6.7), *Leptospermum polygalifolium* (21.7, 3.4)

Additional species:

*Baccharis halimifolia** (17.4, 27.0), *Allocasuarina littoralis* (17.4, 9.0), *Melaleuca quinquenervia* (17.4, 1.4), *Glochidion sumatranum* (13.0, 6.8), *Parsonia straminea* (13.0, 3.5), *Banksia robur* (8.7, 12.0), *Acacia leptocarpa* (8.7, 4.0), *Banksia oblongifolia* (8.7, 3.0), *Cinnamomum camphora** (8.7, 1.0), *Solanum mauritanium** (8.7, 1.0), *Acacia melanoxylon* (8.7, 0.0), *Corymbia intermedia* (8.7, 0.0), *Glochidion ferdinandi* var. *ferdinandi* (8.7, 0.0), *Pultenaea retusa* (8.7, 0.0), *Pultenaea myrtoides* (4.3, 48.0), *Xanthorrhoea fulva* (4.3, 16.0), *Melaleuca linariifolia* (4.3, 9.0), *Melaleuca thymifolia* (4.3, 8.0), *Dodonaea triquetra* (4.3, 5.0), *Hodgkinsonia ovatiflora* (4.3, 4.0), *Persoonia comifolia* (4.3, 4.0), *Acacia concurrens* (4.3, 3.0), *Passiflora subpeltata** (4.3, 3.0), *Casuarina glauca* (4.3, 2.0), *Elaeocarpus reticulatus* (4.3, 1.6), *Ficus coronata* (4.3, 1.0), *Livistona australis* (4.3, 1.0), *Myrsine* (4.3, 1.0), *Psychotria loniceroides* (4.3, 1.0), *Rhodomyrtus psidioides* (4.3, 1.0), *Schinus terebinthifolius** (4.3, 1.0), *Trema tomentosa* (4.3, 1.0), *Grevillea banksii* (4.3, 0.7), *Polyscias elegans* (4.3, 0.6), *Sida rhombifolia** (4.3, 0.5), *Commersonia bartramia* (4.3, 0.2), *Acrotriche aggregata* (4.3, 0.0), *Archontophoenix cunninghamiana* (4.3, 0.0), *Asclepias curassavica** (4.3, 0.0), *Austromyrtus dulcis* (4.3, 0.0), *Billardiera scandens* (4.3, 0.0), *Citrus x limon** (4.3, 0.0), *Cordyline rubra* (4.3, 0.0), *Cupaniopsis anacardioides* (4.3, 0.0), *Cyclophyllum coprosmoides* (4.3, 0.0), *Desmodium nemorosum* (4.3, 0.0), *Eucalyptus exserta* (4.3, 0.0), *Eucalyptus siderophloia* (4.3, 0.0), *Ficus rubiginosa* (4.3, 0.0), *Guioa semiglaucula* (4.3, 0.0), *Hakea actites* (4.3, 0.0), *Hakea florulenta* (4.3, 0.0), *Hibiscus heterophyllus* (4.3, 0.0), *Homalanthus populifolius* (4.3, 0.0), *Livistona decora* (4.3, 0.0), *Melaleuca nodosa* (4.3, 0.0), *Melastoma malabathricum* subsp. *malabathricum* (4.3, 0.0), *Notelaea longifolia* (4.3, 0.0), *Persoonia virgata* (4.3, 0.0), *Rhodamnia rubescens* (4.3, 0.0), *Senna pendula* var. *glabrata** (4.3, 0.0), *Symplocos stawellii* (4.3, 0.0), *Symplocos thwaitesii* (4.3, 0.0), *Synoum glandulosum* (4.3, 0.0)

Stratum: Ground

Height: average: 0.61m; range: 0.30 - 1.00m; (17 sites)

Projective foliage cover (PFC): average: 60.5%; range: 14.0 - 100.0%; (17 sites)

Species list (frequency (%), average cover (%)):

Grass - perennial:

Most frequent species (up to 6):

Imperata cylindrica (94.1, 27.0), *Themeda triandra* (76.5, 26.4), *Ottochloa gracillima* (41.2, 16.2), *Entolasia stricta* (35.3, 1.2), *Paspalum scrobiculatum* (29.4, 2.0), *Paspalidium distans* (23.5, 1.0)

Additional species:

Eremochloa bimaculata (17.6, 13.7), *Panicum effusum* (17.6, 0.0), *Sacciolepis indica* (17.6, 1.0), *Alloteropsis semialata* (11.8, 1.0), *Capillipedium spicigerum* (11.8, 10.0), *Cymbopogon refractus* (11.8, 0.0), *Digitaria parviflora* (11.8, 0.6), *Entolasia marginata* (11.8, 0.0), *Heteropogon contortus* (11.8, 1.0), *Melinis repens** (11.8, 0.0), *Oplismenus aemulus* (11.8, 0.0), *Panicum simile* (11.8, 5.0), *Aristida gracilipes* (5.9, 0.0), *Aristida warburgii* (5.9, 3.0), *Axonopus compressus** (5.9, 1.0), *Cynodon dactylon* var. *dactylon** (5.9, 0.0), *Digitaria ramularis* (5.9, 0.0), *Echinopogon caespitosus* var. *caespitosus* (5.9, 0.0), *Eragrostis* (5.9, 8.0), *Eragrostis brownii* (5.9, 0.0), *Eragrostis spartinoides* (5.9, 0.0), *Eriachne pallescens* (5.9, 20.0), *Ischaemum* (5.9, 20.0), *Ischaemum australe* var. *australe* (5.9, 20.0), *Oplismenus imbecillis* (5.9, 0.0), *Paspalidium disjunctum* (5.9, 0.0), *Paspalidium gausum* (5.9, 0.0), *Paspalidium gracile* (5.9, 0.0), *Paspalum longifolium* (5.9, 2.0), *Paspalum urvillei** (5.9, 0.0), *Poaceae* (5.9, 0.0)

Grass - annual/biennial:

Not present

Forbs & other:

Most frequent species (up to 6):

Lobelia purpurascens (58.8, 0.6), *Lomandra longifolia* (52.9, 7.2), *Pteridium esculentum* (41.2, 13.0), *Centella asiatica* (35.3, 2.0), *Ageratum houstonianum** (29.4, 2.0), *Alphitonia excelsa* (29.4, 0.0)

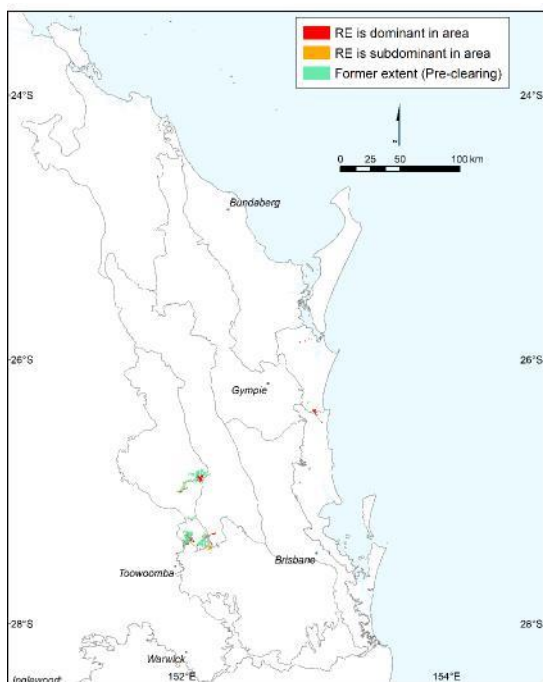
Additional species:

Phyllanthus virgatus (29.4, 0.0), *Baccharis halimifolia** (23.5, 2.0), *Cyanthillium cinereum* (23.5, 0.4), *Melastoma malabathricum* subsp. *malabathricum* (23.5, 0.0), *Bidens pilosa** (17.6, 0.0), *Brunoniella australis* (17.6, 0.0), *Casuarina glauca* (17.6, 0.0), *Dianella caerulea* (17.6, 3.0), *Dianella revoluta* var. *revoluta* (17.6, 0.0), *Emilia sonchifolia** (17.6, 0.0), *Gonocarpus chinensis* subsp. *verrucosus* (17.6,

0.6), *Hypericum gramineum* (17.6, 0.0), *Lepidosperma laterale* (17.6, 0.0), *Parsonsia straminea* (17.6, 2.5), *Passiflora suberosa** (17.6, 0.0), *Philydrum lanuginosum* (17.6, 1.0), *Styphelia leptospermoides* (17.6, 0.0), *Xanthorrhoea fulva* (17.6, 14.0), *Acacia concurrens* (11.8, 0.0), *Acacia disparrima* subsp. *disparrima* (11.8, 0.0), *Acacia leiocalyx* subsp. *leiocalyx* (11.8, 0.0), *Cassytha pubescens* (11.8, 0.0), *Corymbia intermedia* (11.8, 0.0), *Crassocephalum crepidioides** (11.8, 0.0), *Cyperus haspan* (11.8, 0.0), *Cyperus polystachyos* (11.8, 0.0), *Desmodium rhytidophyllum* (11.8, 0.0), *Eustrephus latifolius* (11.8, 0.0), *Fimbristylis dichotoma* (11.8, 0.0), *Glochidion ferdinandi* var. *ferdinandi* (11.8, 0.0), *Glycine clandestina* (11.8, 0.0), *Goodenia mystrophylla* (11.8, 0.0), *Hakea florulenta* (11.8, 0.0), *Hibbertia vestita* (11.8, 0.0), *Juncus polyanthemus* (11.8, 0.0), *Lantana camara** (11.8, 0.0), *Machaerina articulata* (11.8, 1.0), *Machaerina juncea* (11.8, 0.0), *Machaerina rubiginosa* (11.8, 7.0), *Murdannia graminea* (11.8, 0.0), *Oxalis chnoodes* (11.8, 0.0), *Passiflora subpeltata** (11.8, 32.0), *Pultenaea retusa* (11.8, 0.0), *Sida cordifolia** (11.8, 0.0), *Sphaeromorphaea* (11.8, 0.0), *Stephania japonica* (11.8, 0.0), *Symphotrichum subulatum** (11.8, 0.0), *Tricoryne anceps* (11.8, 0.0), *Viola betonicifolia* (11.8, 0.0), *Xyris complanata* (11.8, 0.0), *Acacia longifolia* (5.9, 0.0), *Adiantum hispidulum* (5.9, 0.0), *Alternanthera brasiliana** (5.9, 0.0), *Angophora leiocarpa* (5.9, 0.0), *Asparagus africanus** (5.9, 0.0), *Banksia integrifolia* (5.9, 0.0), *Banksia oblongifolia* (5.9, 0.0), *Banksia robur* (5.9, 0.0), *Billardiera scandens* (5.9, 0.0), *Breynia oblongifolia* (5.9, 0.0), *Bryophyllum** (5.9, 0.0), *Caladenia carneae* (5.9, 0.2), *Cassytha filiformis* (5.9, 1.0), *Centratherum punctatum** (5.9, 0.0), *Cheilanthes sieberi* (5.9, 0.0), *Cheilanthes tenuifolia* (5.9, 0.0), *Choretrum candollei* (5.9, 0.0), *Chrysocephalum apiculatum* (5.9, 0.0), *Cirsium vulgare** (5.9, 0.0), *Commelina diffusa* (5.9, 2.0), *Crinum pedunculatum* (5.9, 0.0), *Crotalaria* (5.9, 0.0), *Curculigo ensifolia* var. *ensifolia* (5.9, 0.0), *Cycnogeton procerus* (5.9, 0.0), *Cymbidium canaliculatum* (5.9, 0.0), *Cyperus difformis* (5.9, 0.0), *Cyperus javanicus* (5.9, 0.0), *Cyperus pilosus* (5.9, 0.0), *Cyperus trinervis* (5.9, 0.0), *Desmodium* (5.9, 0.0), *Dianella* (5.9, 0.0), *Dianella rara* (5.9, 0.0), *Dodonaea triquetra* (5.9, 0.0), *Eleocharis acuta* (5.9, 0.0), *Endiandra sieberi* (5.9, 0.0), *Erigeron bonariensis** (5.9, 0.0), *Eucalyptus pilularis* (5.9, 0.0), *Eucalyptus robusta* x *Eucalyptus tereticornis* (5.9, 0.0), *Eucalyptus tereticornis* (5.9, 0.0), *Fimbristylis cinnamometorum* (5.9, 0.0), *Fimbristylis vaginata* (5.9, 0.0), *Gahnia aspera* (5.9, 0.0), *Gahnia sieberiana* (5.9, 0.0), *Geitonoplesium cymosum* (5.9, 0.0), *Geodorum densiflorum* (5.9, 0.0), *Glochidion sumatranum* (5.9, 0.0), *Gomphocarpus fruticosus** (5.9, 0.0), *Gomphocarpus physocarpus** (5.9, 0.0), *Gompholobium pinnatum* (5.9, 0.0), *Gonocarpus* (5.9, 0.0), *Grevillea leiophylla* (5.9, 0.0), *Grewia latifolia* (5.9, 0.0), *Hakea actites* (5.9, 0.0), *Hardenbergia violacea* (5.9, 0.0), *Hibbertia scandens* (5.9, 0.0), *Homoranthus virgatus* (5.9, 0.0), *Hydrocotyle acutiloba* (5.9, 0.0), *Hydrocotyle tripartita* (5.9, 0.0), *Hypochaeris radicata** (5.9, 0.0), *Hypoxis pratensis* (5.9, 0.0), *Juncus kraussii* (5.9, 0.0), *Lagenophora stipitata* (5.9, 0.0), *Lepironia articulata** (5.9, 1.0), *Lobelia membranacea* (5.9, 0.0), *Lomandra confertifolia* subsp. *pallida* (5.9, 1.0), *Lomandra hystrix* (5.9, 0.0), *Lomandra laxa* (5.9, 2.4), *Lomandra multiflora* subsp. *multiflora* (5.9, 0.0), *Lophostemon suaveolens* (5.9, 0.0), *Ludwigia* (5.9, 0.0), *Lumnitzera racemosa* (5.9, 0.0), *Melaleuca nodosa* (5.9, 0.0), *Melaleuca thymifolia* (5.9, 2.0), *Melicope elleryana* (5.9, 0.0), *Myriophyllum gracile* (5.9, 0.0), *Ochna serrulata** (5.9, 0.0), *Oxalis radicata* (5.9, 0.0), *Parsonsia eucalyptophylla* (5.9, 0.0), *Passiflora edulis** (5.9, 0.0), *Passiflora foetida** (5.9, 0.0), *Phyllanthus gunnii* (5.9, 0.0), *Pimelea linifolia* subsp. *linifolia* (5.9, 0.0), *Polygala* (5.9, 0.0), *Polymeria calycina* (5.9, 0.0), *Ptilothrix deusta* (5.9, 0.0), *Ranunculus inundatus* (5.9, 0.0), *Schoenus brevifolius* (5.9, 1.0), *Scleria levis* (5.9, 0.0), *Scleria tricuspidata* (5.9, 0.0), *Solanum americanum** (5.9, 0.0), *Sonchus oleraceus** (5.9, 0.0), *Spergularia rubra** (5.9, 0.0), *Styliidium debile* (5.9, 0.0), *Telmatoblechnum indicum* (5.9, 0.0), *Trema tomentosa* var. *aspera* (5.9, 0.0), *Tricoryne elatior* (5.9, 0.0), *Triglochin* (5.9, 0.0), *Verbena* (5.9, 0.0), *Xanthorrhoea johnsonii* (5.9, 0.0), *Xanthorrhoea latifolia* subsp. *latifolia* (5.9, 1.0), *Xyris juncea* (5.9, 0.0), *Zornia muriculata* (5.9, 0.0)

Species list: Frequency (percent of total sites) and cover (average of species cover across sites where that species is present). Ordered by decreasing frequency. Naturalised species have an asterisk (*) after the name. indet. after listed name if indeterminate species or genus.

12.5.6c: *Eucalyptus pilularis* open forest on remnant Tertiary surfaces. Usually deep red soils



Mapping data	Pre-clearing area = 16,107.9 ha; Remnant area 2019 = 5,582.6 ha; Remnant percent remaining in 2019 = 34.7 %
Species richness	total: 157 (10 sites); woody: 77 (9 sites); ground: 88 (7 sites); average spp./site: 33.0, standard deviation: 8.5 (7 sites)
Basal area	average/site: 22.1 m ² /ha; range: 16.0 - 34.0 m ² /ha; std. deviation: 5.3; (9 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 28.30m; range: 19.00 - 40.00m; (10 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 61.0%; range: 32.0 - 100.0%; (10 sites)
Structural formation	Open Forest: 40.0 %; Tall Woodland: 20.0 %; Tall Open Forest: 20.0 %; Woodland: 10.0 %; Tall Closed Forest: 10.0 %; (10 sites)
Representative site(s)	3204, 3434, 3497, 4098, 4113, 5152, 14682, 17215, 17230, 17231

Stratum: Tree 1 (EDL)

Height: average: 28.30m; range: 19.00 - 40.00m; (10 sites)

Crown Cover: average: 61.0%; range: 32.0 - 100.0%; (10 sites)

Stem Count: average: 205 stems/ha; range: 160 - 240 stems/ha; std. deviation: 41.2 stems/ha; (4 sites)

Basal area: average: 17.3 m²/ha; range: 10.0 - 23.0 m²/ha; std. deviation: 4.6 m²/ha; (9 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Eucalyptus pilularis (100.0, 29.3), *Eucalyptus microcorys* (40.0, 34.8), *Corymbia intermedia* (40.0, 5.5), *Corymbia trachyphloia* subsp. *trachyphloia* (30.0, 23.0), *Lophostemon confertus* (30.0, 0.0), *Endiandra sieberi* (20.0, 21.0)

Additional species:

Syncarpia glomulifera subsp. *glomulifera* (20.0, 21.0), *Eucalyptus robusta* (20.0, 12.2), *Eucalyptus siderophloia* (20.0, 3.0), *Eucalyptus acmenoides* (20.0, 2.0), *Eucalyptus biturbinata* (20.0, 2.0), *Eucalyptus saligna* (10.0, 19.0), *Eucalyptus racemosa* subsp. *racemosa* (10.0, 12.0), *Eucalyptus montivaga* (10.0, 10.0), *Allocasuarina littoralis* (10.0, 2.0), *Eucalyptus propinqua* (10.0, 0.0), *Melaleuca quinquenervia* (10.0, 0.0)

Stratum: Tree 2

Height: average: 17.00m; range: 9.00 - 31.00m; (9 sites)

Crown Cover: average: 18.8%; range: 2.0 - 66.4%; (9 sites)

Stem Count: average: 365 stems/ha; range: 180 - 580 stems/ha; std. deviation: 179.9 stems/ha; (4 sites)

Basal area: average: 4.8 m²/ha; range: 1.0 - 13.0 m²/ha; std. deviation: 3.7 m²/ha; (8 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Lophostemon confertus (30.0, 24.2), *Allocasuarina littoralis* (30.0, 5.7), *Corymbia intermedia* (30.0, 2.0), *Eucalyptus microcorys* (30.0, 1.5), *Syncarpia glomulifera subsp. glomulifera* (20.0, 5.1), *Endiandra sieberi* (20.0, 0.0)

Additional species:

Corymbia trachyphloia subsp. trachyphloia (10.0, 20.0), *Livistona australis* (10.0, 12.0), *Sannantha bidwillii* (10.0, 10.0), *Eucalyptus pilularis* (10.0, 5.0), *Acacia maidenii* (10.0, 3.8), *Acacia leiocalyx subsp. leiocalyx* (10.0, 2.0), *Acacia penninervis var. longiracemosa* (10.0, 2.0), *Allocasuarina torulosa* (10.0, 2.0), *Elaeocarpus reticulatus* (10.0, 2.0), *Baeckea frutescens* (10.0, 1.0), *Eucalyptus montivaga* (10.0, 1.0), *Eucalyptus saligna* (10.0, 1.0), *Eucalyptus siderophloia* (10.0, 1.0), *Leptospermum whitei* (10.0, 1.0), *Alphitonia excelsa* (10.0, 0.0), *Eucalyptus robusta* (10.0, 0.0), *Flagellaria indica* (10.0, 0.0), *Melaleuca quinquenervia* (10.0, 0.0), *Sarcopetalum harveyanum* (10.0, 0.0)

Stratum: Tree 3

Height: average: 7.00m; range: 5.00 - 8.00m; (5 sites)

Crown Cover: average: 6.5%; range: 0.0 - 19.4%; (4 sites)

Stem Count: average: 400 stems/ha; range: 160 - 640 stems/ha; std. deviation: 339.4 stems/ha; (2 sites)

Basal area: average: 1.0 m²/ha; range: 1.0 - 1.0 m²/ha; std. deviation: 0.0 m²/ha; (2 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Livistona australis (10.0, 17.4), *Acacia melanoxylon* (10.0, 3.0), *Clerodendrum floribundum* (10.0, 2.0), *Lophostemon confertus* (10.0, 2.0), *Lophostemon suaveolens* (10.0, 1.0), *Glochidion ferdinandi var. ferdinandi* (10.0, 0.6)

Additional species:

Acacia disparima subsp. disparima (10.0, 0.0), *Acacia irrorata subsp. irrorata* (10.0, 0.0), *Alphitonia excelsa* (10.0, 0.0), *Elaeocarpus reticulatus* (10.0, 0.0), *Endiandra sieberi* (10.0, 0.0), *Neolitsea dealbata* (10.0, 0.0), *Sannantha bidwillii* (10.0, 0.0), *Syzygium oleosum* (10.0, 0.0)

Stratum: Shrub 1

Height: average: 2.16m; range: 1.60 - 3.00m; (10 sites)

Crown Cover: average: 23.3%; range: 3.0 - 77.2%; (10 sites)

Stem Count: average: 4,090 stems/ha; range: 1,520 - 6,280 stems/ha; std. deviation: 2,281.8 stems/ha; (4 sites)

Basal area: average: 1.5 m²/ha; range: 1.0 - 2.0 m²/ha; std. deviation: 0.7 m²/ha; (2 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

*Lantana camara** (50.0, 6.4), *Livistona australis* (40.0, 17.8), *Allocasuarina torulosa* (40.0, 9.8), *Syncarpia glomulifera subsp. glomulifera* (40.0, 3.9), *Leucopogon pimeleoides* (40.0, 3.3), *Lophostemon confertus* (40.0, 1.7)

Additional species:

Alphitonia excelsa (30.0, 6.3), *Sannantha bidwillii* (20.0, 32.2), *Syzygium oleosum* (20.0, 6.2), *Elaeocarpus reticulatus* (20.0, 5.0), *Hibiscus heterophyllus* (20.0, 5.0), *Dodonaea triquetra* (20.0, 4.4), *Denhamia silvestris* (20.0, 2.0), *Endiandra sieberi* (20.0, 1.0), *Acacia nerifolia* (20.0, 0.5), *Breynia oblongifolia* (20.0, 0.5), *Austromyrtus dulcis* (20.0, 0.0), *Dioscorea transversa* (20.0, 0.0), *Glochidion ferdinandi var. ferdinandi* (20.0, 0.0), *Smilax australis* (20.0, 0.0), *Wikstroemia indica* (20.0, 0.0), *Baeckea frutescens* (10.0, 20.0),

Acacia implexa (10.0, 8.0), *Acacia irrorata* subsp. *irrorata* (10.0, 2.0), *Acacia disparrima* subsp. *disparrima* (10.0, 1.0), *Banksia robur* (10.0, 1.0), *Glochidion sumatranum* (10.0, 1.0), *Leptospermum whitei* (10.0, 1.0), *Xanthorrhoea johnsonii* (10.0, 1.0), *Psychotria loniceroides* (10.0, 0.8), *Syagrus romanzoffiana** (10.0, 0.8), *Pittosporum venulosum* (10.0, 0.6), *Ligustrum lucidum** (10.0, 0.5), *Acacia melanoxylon* (10.0, 0.0), *Acmena smithii* (10.0, 0.0), *Asplenium australasicum* (10.0, 0.0), *Astrotricha latifolia* (10.0, 0.0), *Banksia integrifolia* subsp. *integrifolia* (10.0, 0.0), *Canarium australasicum* (10.0, 0.0), *Cassinia laevis* subsp. *rosmarinifolia* (10.0, 0.0), *Cissus hypoglauca* (10.0, 0.0), *Corymbia intermedia* (10.0, 0.0), *Eucalyptus microcorys* (10.0, 0.0), *Eucalyptus pilularis* (10.0, 0.0), *Flagellaria indica* (10.0, 0.0), *Flindersia schottiana* (10.0, 0.0), *Geitonoplesium cymosum* (10.0, 0.0), *Hibbertia aspera* subsp. *aspera* (10.0, 0.0), *Hovea acutifolia* (10.0, 0.0), *Indigofera australis* (10.0, 0.0), *Jagera pseudorhus* var. *pseudorhus* (10.0, 0.0), *Logania albiflora* (10.0, 0.0), *Lophostemon suaveolens* (10.0, 0.0), *Melodinus australis* (10.0, 0.0), *Neolitsea dealbata* (10.0, 0.0), *Notelaea punctata* (10.0, 0.0), *Ochna serrulata** (10.0, 0.0), *Passiflora suberosa** (10.0, 0.0), *Platylobium formosum* (10.0, 0.0), *Polyscias elegans* (10.0, 0.0), *Trema tomentosa* (10.0, 0.0)

Stratum: Ground

Height: average: 0.58m; range: 0.40 - 0.75m; (7 sites)

Projective foliage cover (PFC): average: 37.7%; range: 0.0 - 75.0%; (7 sites)

Species list (frequency (%), average cover (%)):

Grass - perennial:

Most frequent species (up to 6):

Imperata cylindrica (71.4, 4.2), *Themeda triandra* (57.1, 13.0), *Entolasia stricta* (42.9, 1.7), *Oplismenus aemulus* (28.6, 1.0), *Ottochloa gracillima* (28.6, 24.6), *Digitaria parviflora* (14.3, 2.0)

Additional species:

Microlaena stipoides (14.3, 2.0), *Ottochloa nodosa* (14.3, 0.0), *Panicum effusum* (14.3, 0.0), *Poa* (14.3, 0.0)

Grass - annual/biennial:

Not present

Forbs & other:

Most frequent species (up to 6):

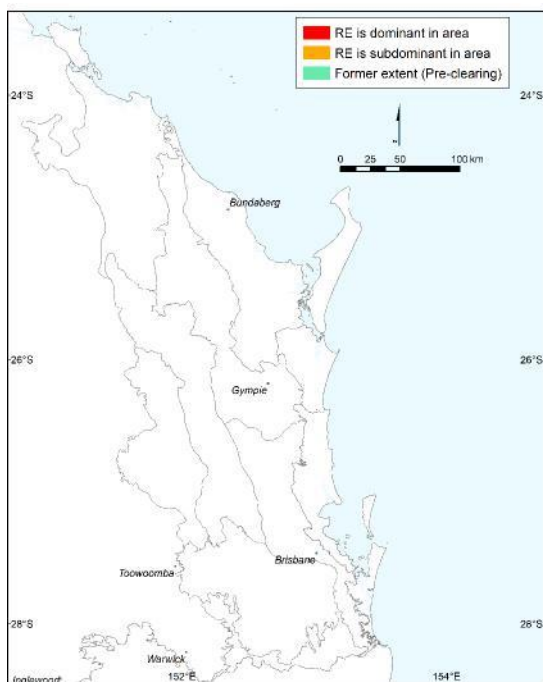
Pteridium esculentum (71.4, 2.1), *Smilax australis* (57.1, 3.2), *Telmatoblechnum indicum* (57.1, 2.8), *Dianella caerulea* (42.9, 1.7), *Lomandra longifolia* (42.9, 6.0), *Austromyrtus dulcis* (28.6, 0.0)

Additional species:

Baloskion tetraphyllum subsp. *meiostachyum* (28.6, 1.5), *Billardiera scandens* (28.6, 0.4), *Breynia oblongifolia* (28.6, 2.0), *Cassytha filiformis* (28.6, 0.0), *Cissus hypoglauca* (28.6, 0.0), *Desmodium rhytidophyllum* (28.6, 0.0), *Dodonaea triquetra* (28.6, 5.0), *Gahnia aspera* (28.6, 0.6), *Gahnia clarkei* (28.6, 26.2), *Livistona australis* (28.6, 2.3), *Lomandra filiformis* subsp. *filiformis* (28.6, 0.7), *Xanthorrhoea latifolia* subsp. *latifolia* (28.6, 5.5), *Acacia disparrima* subsp. *disparrima* (14.3, 0.0), *Acacia penninervis* var. *longiracemosa* (14.3, 0.0), *Alphitonia excelsa* (14.3, 2.0), *Asperula conferta* (14.3, 0.0), *Astrotricha latifolia* (14.3, 2.4), *Brunoniella australis* (14.3, 0.0), *Cassytha pubescens* (14.3, 1.0), *Caustis flexuosa* (14.3, 13.4), *Centratherum punctatum** (14.3, 0.0), *Cupaniopsis parvifolia* (14.3, 0.0), *Cyclophyllum coprosmoides* (14.3, 0.0), *Denhamia bilocularis* (14.3, 0.0), *Desmodium gunnii* (14.3, 0.0), *Dianella* (14.3, 1.0), *Dianella nervosa* (14.3, 0.0), *Dichondra repens* (14.3, 0.0), *Elaeocarpus reticulatus* (14.3, 1.0), *Eustrephus latifolius* (14.3, 1.0), *Flagellaria indica* (14.3, 0.0), *Glycine clandestina* var. *clandestina* (14.3, 1.0), *Gomphocarpus physocarpus** (14.3, 0.0), *Goodenia rotundifolia* (14.3, 1.0), *Hardenbergia violacea* (14.3, 0.0), *Hibbertia scandens* (14.3, 0.0), *Hibbertia vestita* (14.3, 0.0), *Homoranthus virgatus* (14.3, 0.0), *Hovea* (14.3, 0.0), *Hydrocotyle laxiflora* (14.3, 0.0), *Indigofera australis* (14.3, 0.0), *Lepidosperma laterale* (14.3, 1.0), *Leptospermum whitei* (14.3, 0.0), *Lomandra laxa* (14.3, 0.0), *Lophostemon confertus* (14.3, 0.0), *Melaleuca quinquenervia* (14.3, 0.0), *Mentha satuireioides* (14.3, 0.0), *Oxalis* (14.3, 0.2), *Parsonsia eucalyptophylla* (14.3, 0.0), *Passiflora edulis** (14.3, 0.0), *Passiflora foetida** (14.3, 0.0), *Passiflora suberosa** (14.3, 2.0), *Passiflora subpeltata** (14.3, 0.0), *Pimelea* (14.3, 0.0), *Pimelea linifolia* subsp. *linifolia* (14.3, 0.0), *Pimelea neoanglica* (14.3, 0.0), *Polygala virgata** (14.3, 0.0), *Pomax umbellata* (14.3, 0.0), *Psychotria daphnoides* (14.3, 0.0), *Pultenaea villosa* (14.3, 0.0), *Rubus moluccanus* var. *trilobus* (14.3, 0.0), *Rubus parvifolius* (14.3, 0.0), *Schoenus brevifolius* (14.3, 0.0), *Smilax glycyphylla* (14.3, 0.2), *Stephania japonica* (14.3, 0.0), *Sticherus flabellatus* (14.3, 0.0), *Thysanotus tuberosus* (14.3, 0.0), *Tricoryne anceps* subsp. *pterocaulon* (14.3, 0.0), *Trochocarpa laurina* (14.3, 0.0), *Wikstroemia indica* (14.3, 0.0), *Zieria minutiflora* subsp. *minutiflora* (14.3, 0.0), *Zieria smithii* (14.3, 0.6)

Species list: Frequency (percent of total sites) and cover (average of species cover across sites where that species is present). Ordered by decreasing frequency. Naturalised species have an asterisk (*) after the name. indet. after listed name if indeterminate species or genus.

12.9-10.1x1: *Eucalyptus resinifera*, *E. grandis*, *Corymbia intermedia* tall shrubby open forest often on remnant Tertiary surfaces



Mapping data	Pre-clearing area = 107.2 ha; Remnant area 2019 = 15.8 ha; Remnant percent remaining in 2019 = 14.7 %
Species richness	total: 85 (4 sites); woody: 64 (4 sites); ground: 34 (4 sites); average spp./site: 36.2, standard deviation: 8.1 (4 sites)
Basal area	average/site: 31.0 m ² /ha; range: 16.0 - 41.0 m ² /ha; std. deviation: 10.8; (4 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 25.00m; range: 18.00 - 30.00m; (4 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 71.5%; range: 35.0 - 88.8%; (4 sites)
Structural formation	Open Forest: 50.0 %; Tall Open Forest: 50.0 %; (4 sites)
Representative site(s)	3228, 17212, 17226, 17276

Stratum: Tree 1 (EDL)

Height: average: 25.00m; range: 18.00 - 30.00m; (4 sites)

Crown Cover: average: 71.5%; range: 35.0 - 88.8%; (4 sites)

Stem Count: average: 313 stems/ha; range: 240 - 380 stems/ha; std. deviation: 70.2 stems/ha; (3 sites)

Basal area: average: 16.4 m²/ha; range: 10.0 - 21.0 m²/ha; std. deviation: 5.1 m²/ha; (4 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Syncarpia glomulifera subsp. *glomulifera* (100.0, 21.0), *Lophostemon confertus* (100.0, 4.5), *Eucalyptus resinifera* (75.0, 33.5), *Eucalyptus pilularis* (75.0, 9.6), *Eucalyptus robusta* (50.0, 16.3), *Eucalyptus grandis* (50.0, 4.4)

Additional species:

Endiandra sieberi (25.0, 30.0), *Cryptocarya microneura* (25.0, 1.0), *Melaleuca quinquenervia* (25.0, 1.0), *Corymbia intermedia* (25.0, 0.0), *Leptospermum whitei* (25.0, 0.0)

Stratum: Tree 2

Height: average: 15.25m; range: 8.00 - 20.00m; (4 sites)

Crown Cover: average: 36.9%; range: 16.0 - 61.0%; (4 sites)

Stem Count: average: 860 stems/ha; range: 680 - 1,140 stems/ha; std. deviation: 245.8 stems/ha; (3 sites)

Basal area: average: 13.1 m²/ha; range: 5.0 - 23.5 m²/ha; std. deviation: 8.3 m²/ha; (4 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Lophostemon confertus (75.0, 22.6), *Syncarpia glomulifera* subsp. *glomulifera* (75.0, 21.7), *Endiandra sieberi* (50.0, 14.0), *Leptospermum whitei* (50.0, 6.7), *Allocasuarina torulosa* (50.0, 1.0), *Allocasuarina littoralis* (25.0, 4.8)

Additional species:

Cryptocarya microneura (25.0, 1.0), *Eucalyptus resinifera* (25.0, 1.0), *Livistona australis* (25.0, 1.0), *Sannantha bidwillii* (25.0, 1.0), *Baeckea frutescens* (25.0, 0.0), *Banksia robur* (25.0, 0.0), *Cissus hypoglauca* (25.0, 0.0), *Corymbia intermedia* (25.0, 0.0), *Cryptocarya glaucescens* (25.0, 0.0), *Elaeocarpus reticulatus* (25.0, 0.0), *Flindersia bennettii* (25.0, 0.0), *Melaleuca salicina* (25.0, 0.0), *Parsonsia plaesiophylla* (25.0, 0.0), *Petalostigma triloculare* (25.0, 0.0), *Syzygium oleosum* (25.0, 0.0)

Stratum: Tree 3

Height: average: 8.67m; range: 8.00 - 10.00m; (3 sites)

Crown Cover: average: 50.1%; range: 35.4 - 66.6%; (3 sites)

Stem Count: average: 760 stems/ha; range: 600 - 880 stems/ha; std. deviation: 144.2 stems/ha; (3 sites)

Basal area: average: 1.5 m²/ha; range: 1.0 - 2.0 m²/ha; std. deviation: 0.7 m²/ha; (2 sites)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Syncarpia glomulifera subsp. *glomulifera* (75.0, 13.3), *Cryptocarya glaucescens* (50.0, 10.7), *Petalostigma triloculare* (50.0, 5.6), *Leptospermum whitei* (25.0, 38.2), *Baeckea frutescens* (25.0, 13.4), *Endiandra discolor* (25.0, 10.4)

Additional species:

Flindersia bennettii (25.0, 9.4), *Allocasuarina torulosa* (25.0, 4.0), *Allocasuarina littoralis* (25.0, 3.2), *Elaeocarpus reticulatus* (25.0, 2.0), *Syzygium oleosum* (25.0, 1.8), *Banksia robur* (25.0, 1.0), *Alphitonia excelsa* (25.0, 0.0), *Cissus hypoglauca* (25.0, 0.0), *Cryptocarya microneura* (25.0, 0.0), *Endiandra sieberi* (25.0, 0.0), *Flagellaria indica* (25.0, 0.0), *Flindersia schottiana* (25.0, 0.0), *Guioa acutifolia* (25.0, 0.0), *Notelaea punctata* (25.0, 0.0), *Smilax glycyphylla* (25.0, 0.0), *Synoum glandulosum* subsp. *glandulosum* (25.0, 0.0), *Wilkiea huegeliana* (25.0, 0.0)

Stratum: Shrub 1

Height: average: 2.10m; range: 1.80 - 3.00m; (4 sites)

Crown Cover: average: 17.6%; range: 12.0 - 26.0%; (4 sites)

Stem Count: average: 3,640 stems/ha; range: 2,520 - 4,680 stems/ha; std. deviation: 1,082.2 stems/ha; (3 sites)

Basal area: average: 3.0 m²/ha; range: 3.0 - 3.0 m²/ha; std. deviation: 0.0 m²/ha; (1 site)

Species list (frequency (%), average cover (%)):

Most frequent species (up to 6):

Livistona australis (75.0, 2.2), *Elaeocarpus reticulatus* (50.0, 10.0), *Petalostigma triloculare* (50.0, 9.6), *Austromyrtus dulcis* (50.0, 7.8), *Syzygium oleosum* (50.0, 2.6), *Cryptocarya glaucescens* (50.0, 1.7)

Additional species:

Acacia penninervis var. *longiracemosa* (50.0, 1.0), *Baeckea frutescens* (50.0, 1.0), *Banksia robur* (50.0, 1.0), *Leucopogon pimeleoides* (50.0, 1.0), *Endiandra discolor* (50.0, 0.6), *Endiandra sieberi* (50.0, 0.6), *Syncarpia glomulifera* subsp. *glomulifera* (50.0, 0.6), *Flagellaria indica* (50.0, 0.0), *Lophostemon confertus* (50.0, 0.0), *Myrsine variabilis* (50.0, 0.0), *Notelaea punctata* (50.0, 0.0), *Planchonella chartacea* (50.0, 0.0), *Platylobium formosum* (50.0, 0.0), *Sannantha bidwillii* (50.0, 0.0), *Smilax glycyphylla* (50.0, 0.0), *Wilkiea huegeliana* (50.0, 0.0), *Zieria minutiflora* subsp. *minutiflora* (50.0, 0.0), *Acmena smithii* (25.0, 10.0), *Acrotriche aggregata* (25.0, 10.0), *Calamus muelleri* (25.0, 3.8), *Guioa acutifolia* (25.0, 1.6), *Leptospermum whitei* (25.0, 1.6), *Aotus ericoides* (25.0, 1.0), *Monotoca* sp. (*Fraser Island P.Baxter 777*) (25.0, 1.0), *Acacia irrorata* subsp. *irrorata* (25.0, 0.0), *Allocasuarina torulosa* (25.0, 0.0), *Alphitonia excelsa* (25.0,

0.0), *Breynia oblongifolia* (25.0, 0.0), *Cinnamomum camphora** (25.0, 0.0), *Coelospermum paniculatum* var. *paniculatum* (25.0, 0.0), *Cordyline petiolaris* (25.0, 0.0), *Cordyline rubra* (25.0, 0.0), *Cryptocarya microneura* (25.0, 0.0), *Denhamia celastroides* (25.0, 0.0), *Diospyros pentamera* (25.0, 0.0), *Dodonaea triquetra* (25.0, 0.0), *Elaeocarpus eumundi* (25.0, 0.0), *Flindersia bennettii* (25.0, 0.0), *Hibbertia scandens* (25.0, 0.0), *Jagera pseudorhus* var. *pseudorhus* (25.0, 0.0), *Melaleuca salicina* (25.0, 0.0), *Melodinus australis* (25.0, 0.0), *Parsonia eucalyptophylla* (25.0, 0.0), *Persoonia virgata* (25.0, 0.0), *Ptilidiostigma rhytispermum* (25.0, 0.0), *Smilax australis* (25.0, 0.0), *Synoum glandulosum* subsp. *glandulosum* (25.0, 0.0), *Trochocarpa laurina* (25.0, 0.0)

Stratum: Ground

Height: average: 0.65m; range: 0.60 - 0.80m; (4 sites)

Projective foliage cover (PFC): average: 28.6%; range: 15.2 - 55.0%; (4 sites)

Species list (frequency (%), average cover (%)):

Grass - perennial:

Most frequent species (up to 6):

Ottochloa gracillima (50.0, 4.9), *Entolasia stricta* (25.0, 0.0),

Additional species:

Grass - annual/biennial:

Not present

Forbs & other:

Most frequent species (up to 6):

Gahnia clarkii (75.0, 7.5), *Livistona australis* (75.0, 1.0), *Smilax glycyphylla* (75.0, 2.6), *Telmatoblechnum indicum* (75.0, 1.7), *Alphitonia excelsa* (50.0, 0.3), *Austromyrtus dulcis* (50.0, 2.2)

Additional species:

Baloskion tetraphyllum subsp. *meiostachyum* (50.0, 12.7), *Billardiera scandens* (50.0, 0.0), *Dianella caerulea* (50.0, 0.0), *Lepidosperma laterale* (50.0, 0.7), *Lomandra longifolia* (50.0, 8.4), *Psilotum nudum* (50.0, 0.0), *Pteridium esculentum* (50.0, 0.0), *Schoenus brevifolius* (50.0, 1.6), *Smilax australis* (50.0, 2.4), *Xanthorrhoea latifolia* subsp. *latifolia* (50.0, 0.4), *Acacia penninervis* var. *longiracemosa* (25.0, 0.0), *Calamus muelleri* (25.0, 0.0), *Cassytha filiformis* (25.0, 0.0), *Caustis flexuosa* (25.0, 2.0), *Cordyline petiolaris* (25.0, 0.0), *Elaeocarpus reticulatus* (25.0, 0.2), *Eucalyptus robusta* (25.0, 2.0), *Flagellaria indica* (25.0, 0.4), *Gahnia sieberiana* (25.0, 3.4), *Leptospermum polygalifolium* (25.0, 1.0), *Lomandra laxa* (25.0, 0.0), *Platysace lanceolata* (25.0, 1.0), *Sannantha bidwillii* (25.0, 0.2), *Styphelia leptospermoides* (25.0, 1.0), *Syzygium oleosum* (25.0, 1.6), *Zieria smithii* (25.0, 10.0)

Species list: Frequency (percent of total sites) and cover (average of species cover across sites where that species is present). Ordered by decreasing frequency. Naturalised species have an asterisk (*) after the name. indet. after listed name if indeterminate species or genus.