



# South East Queensland Horse Trail Network Interim Assessment: Mapleton National Park



Queensland  
Government



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

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Photo taken at Mapleton site 5 on 22 Aug 2017 (Michael Ngugi and John Neldner) and used with permission.

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## Introduction:

Mapleton National Park conserves the largest parcel of native forest remaining along the Blackall Range in the Sunshine Coast Hinterland (QPWS, 2013). The national park is part of a network of parks and forests that protect the Blackall Range's remnant forest communities, provide essential wildlife habitat and scenic places for nature-based recreation. It contains ecosystems and species of conservation value which are of significance to state biodiversity and warrant a high level of protection. Mapleton National Park was gazetted on 3 June 2011 and is an amalgamation of part of Mapleton Forest Reserve (transferred from State Forest tenure under the Southeast Queensland Forests Agreement in 2003) and Delicia Road Conservation Park (QPWS, 2013).

Mapleton National Park (Recovery), also gazetted in June 2011, was previously Mapleton Forest Reserve and covers those areas required for foliage collection. The remaining area of Mapleton Forest Reserve (127ha) contains the Southeast Queensland (SEQ) horse trail network, communication tower, weir and pipeline, Delicia Road mountain-bike area and road revocation (QPWS, 2013). The addition of Mapleton National Park to the protected area estate acknowledges this significant contribution to retaining areas of high-level ecological integrity in Southeast Queensland. Horse riding opportunities previously allowed on the State Forest tenure are available on Mapleton Forest Reserve which runs through and adjacent to the national park. The Jinbara People have a successful native title determination over Mapleton National Park and Mapleton National Park Recovery. An Indigenous Land Use Agreement has been made between the State of Queensland and the Jinibara People Aboriginal Corporation in March 2013. The geographic area includes, but is not limited to, the traditional interests of Jinibara, Kabi Kabi and Gubbi Gubbi people (QPWS, 2013).

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 (Ansong and Pickering, 2013; Potito and Beatty, 2005). 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/parks-and-forests/monitoring-and-managing-potential-impacts)).

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*

Mapleton National Park (NP) including the areas of Forest Reserve covers an area of 10,467 hectares was assessed at five sites containing a total of ten transects in the two most extensive Regional Ecosystems (REs). The regional ecosystems are RE 12.12.2 and 12.12.4 and 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 Mapleton NP arranged by regional ecosystem.*

<b>Regional Ecosystem</b>	<b>Extent (ha)</b>	<b>Proportion of park/reserve (%)</b>	<b>No. of transects examined</b>
<b>12.12.2</b> <i>Eucalyptus pilularis</i> tall open forest on igneous rocks especially granite	4 878	46.6	8
<b>12.12.4</b> <i>Eucalyptus siderophloia</i> , <i>E. propinqua</i> , <i>E. acmenoides</i> open forest on near coastal hills on igneous rocks	334	3.2	2

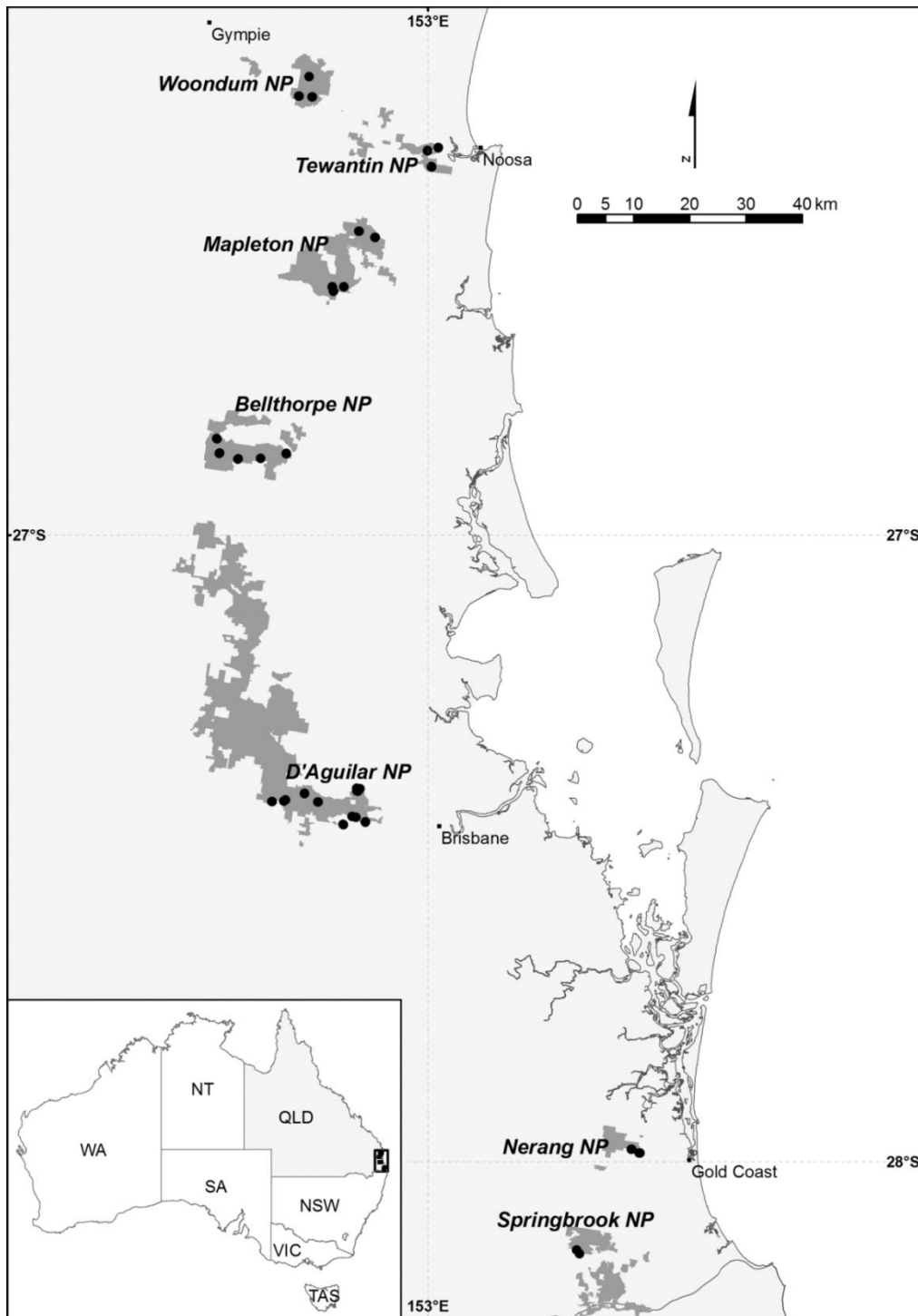


Figure 1. Map of Australia showing Queensland State, location of the seven National Parks (NP) in southeast Queensland that have designated horse trail network, and distribution and location of study sites (Ngugi *et al.* 2014).

### ***Site selection and Sampling***

Permanent sites for vegetation monitoring were established in 2013 along the horse trail network in Bellthorpe National Park and monitored in 2017 and 2020. 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 m<sup>2</sup>). 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.* (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, 2020). 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:**

Mapleton National Park (NP) was assessed at five sites containing a total of 10 transects in the two most extensive Regional Ecosystems (REs). 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 plant species richness and cover in the trail-edge transects is presented in Table 2. No non-native plant species were observed along the trail edge of the monitored forest trails. Within the QBEIS transect, the highest mean cover of non-native species was 1.1% and the highest cover observed at any site was 2.2%. The highest mean of non-native species richness in the QBEIS sites two species with the majority sites having one species (Table 2).

BioCondition score among all the sites ranged from 69 to 100% on a 0 to 100% scale (the higher the score the better the condition) with the lowest mean score of 76% indicating that most sites were in reasonably good condition (Table 3). All the RE recorded high BioCondition scores.

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 Mapleton National Park. 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)
<b>12.12.2a</b> <i>Eucalyptus pilularis</i> tall open forest on Mesozoic to Proterozoic igneous rocks	2A, 3A	1	0	0	0	0	0	0	2	1 – 2
		2	0	0	0	0	0	0	1	1
		3	0	0	0	0	-	-	-	-
<b>12.12.2b</b> <i>Eucalyptus pilularis</i> tall open forest with a distinct understorey dominated by rainforest species on Mesozoic to Proterozoic igneous rocks	13947B, 3B	1	0	0	0	0	0.5	0 - 1	1	1
		2	0	0	0	0	0.5	0 - 1	1	1
		3	0	0	0	0	1.1	0 – 2.2	1	1
<b>12.12.4</b> <i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> +/- <i>Lophostemon confertus</i> , <i>Syncarpia glomulifera</i> , <i>Eucalyptus acmenoides</i> woodland to open forest usually on rocky near coastal areas on Mesozoic to Proterozoic igneous rocks	4A, 4B	1	0	0	0	0	0	0	2	1 – 2
		2	0	0	0	0	0	0	1	1
		3	0	0	0	0	0.3	0 – 0.6	2	1 - 2

\*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 Mapleton National Park.

Regional Ecosystem	Sites	Site Visit	BioCondition mean	BioCondition Range
<b>12.12.2a</b> <i>Eucalyptus pilularis</i> tall open forest on Mesozoic to Proterozoic igneous rocks	13947A, 2A, 2B, 3A	1	80	70 – 91
		2	82	75 – 86
		3	83	81 – 88
<b>12.12.2b</b> <i>Eucalyptus pilularis</i> tall open forest with a distinct understorey dominated by rainforest species on Mesozoic to Proterozoic igneous rocks	13947B, 3B, 5A, 5B	1	76	69 – 85
		2	80	70 – 88
		3	90	80 – 100
<b>12.12.4</b> <i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> +/- <i>Lophostemon confertus</i> , <i>Syncarpia glomulifera</i> , <i>Eucalyptus acmenoides</i> woodland to open forest usually on rocky near coastal areas on Mesozoic to Proterozoic igneous rocks	4A, 4B	1	81	81 – 82
		2	90	86 – 93
		3	91	91-91

## 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 Bellthorpe National 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 five sites (10 transects) across three sampling time points (2013, 2017 and 2020), the majority of sites along designated horse trails in Mapleton National Park showed little to no invasion by non-native species.

Non-native weed species were found to occur at a minimal level across all of the examined regional ecosystems within Mapleton – 12.12.2a/12.12.2b and 12.12.4 – all of which were tall open forest environments dominated by either *Eucalyptus pilularis* or *Eucalyptus racemosa* subsp. *racemosa*. Of the three non-native species that were identified in the survey areas (*Lantana camara*, *Cinnamomum camphor* and *Passiflora suberosa*), all were localised within the QBEIS forest transects (sites 2A, 3A, 3B and 4A) with none present in the associated trail-edge transects.

The presence of non-native plants in the BioCondition assessment forest transects without representatives in the transects adjacent to the trail-edge suggests complex modes of seed dispersal that may not be exclusively dependent on horse trail networks (Ngugi *et al.* 2014). Other such vectors may include mammals and birds (Willson and Crome, 1989) and anthropogenic vectors such as clothing and vehicles (Ansong & Pickering., 2014). The absence of non-native species may be the result of active weed management by National Park authorities that include chemical spraying and the use of fire (Ngugi *et al.* 2014; QPWS, 2012).

Of the 10 transects assessed in the surveys, only two (3B and 4A) contained non-native species through time across all sampling years. Site 3B consistently had *Lantana camara* present across all time points at very low levels of coverage, while site 4A had both *Cinnamomum camphor* and *Passiflora suberosa* present across all years. However, the cover of these non-native species made up less than 5% of the assessment area. This structuring suggests that *Lantana camara* may preferentially colonise ecosystems of *Eucalyptus pilularis* tall open forest with a distinct understorey dominated by rainforest species (12.12.2b), while *Cinnamomum camphor* and *Passiflora suberosa* may prefer woodland to open forest ecosystems that are dominated by *Eucalyptus racemosa* subsp. *racemosa*, with or without the presence of *Lophostemon confertus*, *Syncarpia glomulifera*, *Eucalyptus acmenoides* (12.12.4). However the

distribution of these species between these two regional ecosystems may simply be due to the stochastic nature of seed dispersal.

The remaining non-native species occurred at two other transects (2A and 3A), within *Eucalyptus pilularis* tall open forest (12.12.2a) but were found only in specific years and absent in subsequent visits. Transect 2A was found to contain *C. camphora* during the 2013 sampling only, but not in subsequent sampling time points. Similarly, transect 3A was found to contain *C. camphora* during the 2017 sampling only and *L. camara* in the 2013 sampling only.

### **BioCondition scores within the forest transects**

Sites 2, 3, 4 and 5 all showed consistently high BioCondition scores across all three sampling time points, however fires in 2013 and 2017 caused a decline in BioCondition scores for affected sites. Transects 4A and 5A declined following a fire in 2017 and transect 4B was impacted by a fire in 2013, however sampling in 2020 revealed that BioCondition scores for these sites had returned to benchmark level or near-benchmark level. Transect 13947B exhibited lower BioCondition scores when compared to other transects within Mapleton National Park. The score for this site was constrained by the lack of large trees at the site.

### **Conclusion**

The threat of incursion of non-native species is present in Mapleton National Park. This is mainly from continued and active usage of trails for recreation and mechanical maintenance of the trails. QPWS&P management has kept up with trail edge maintenance and hence reducing incursion and spread of non-native species. The BioCondition scores for the forests were consistently high and monitoring should continue assess incursions and management of non-native species.

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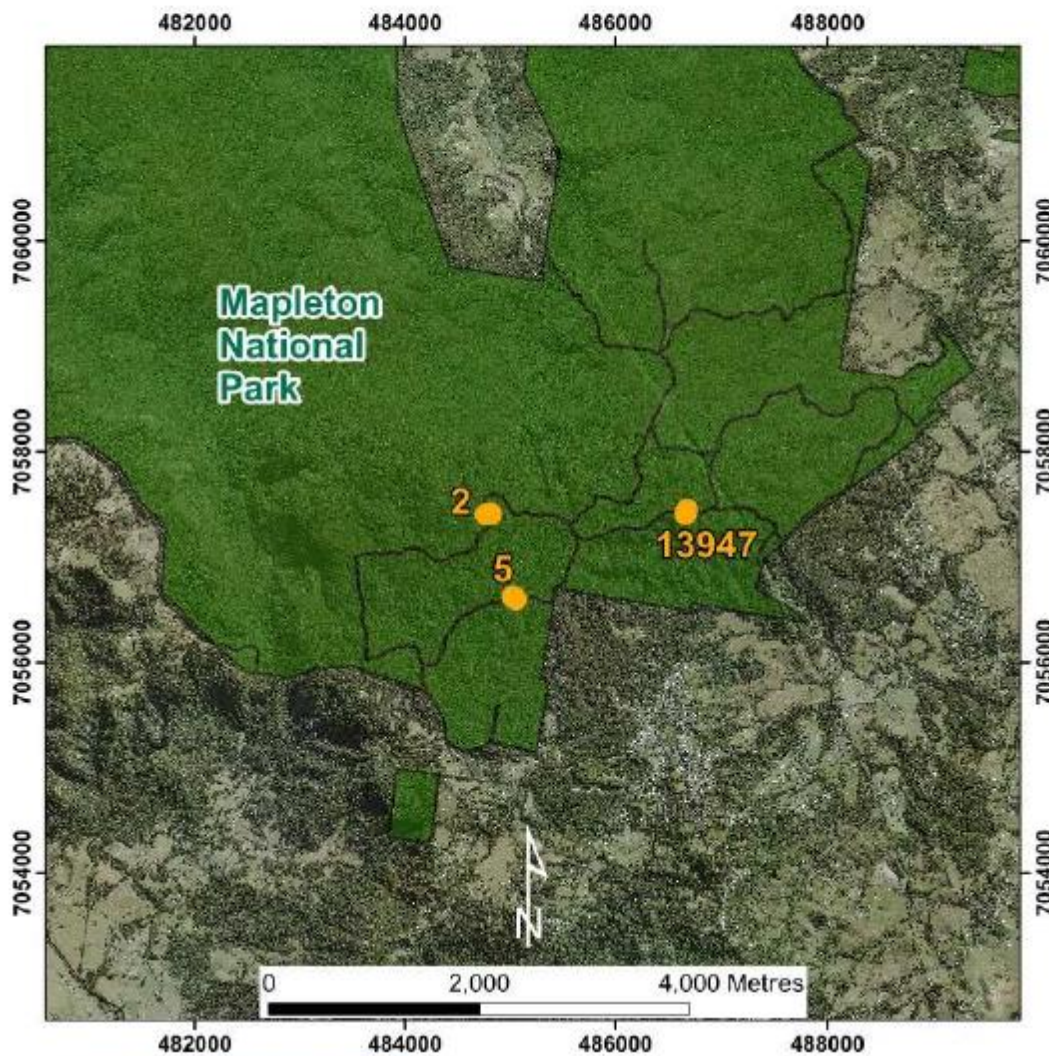
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## Appendix I. Site report cards



**SEQ Monitoring Report Card**

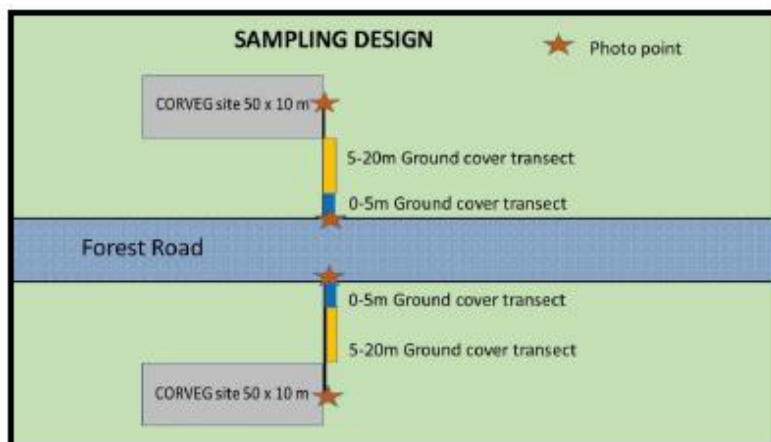
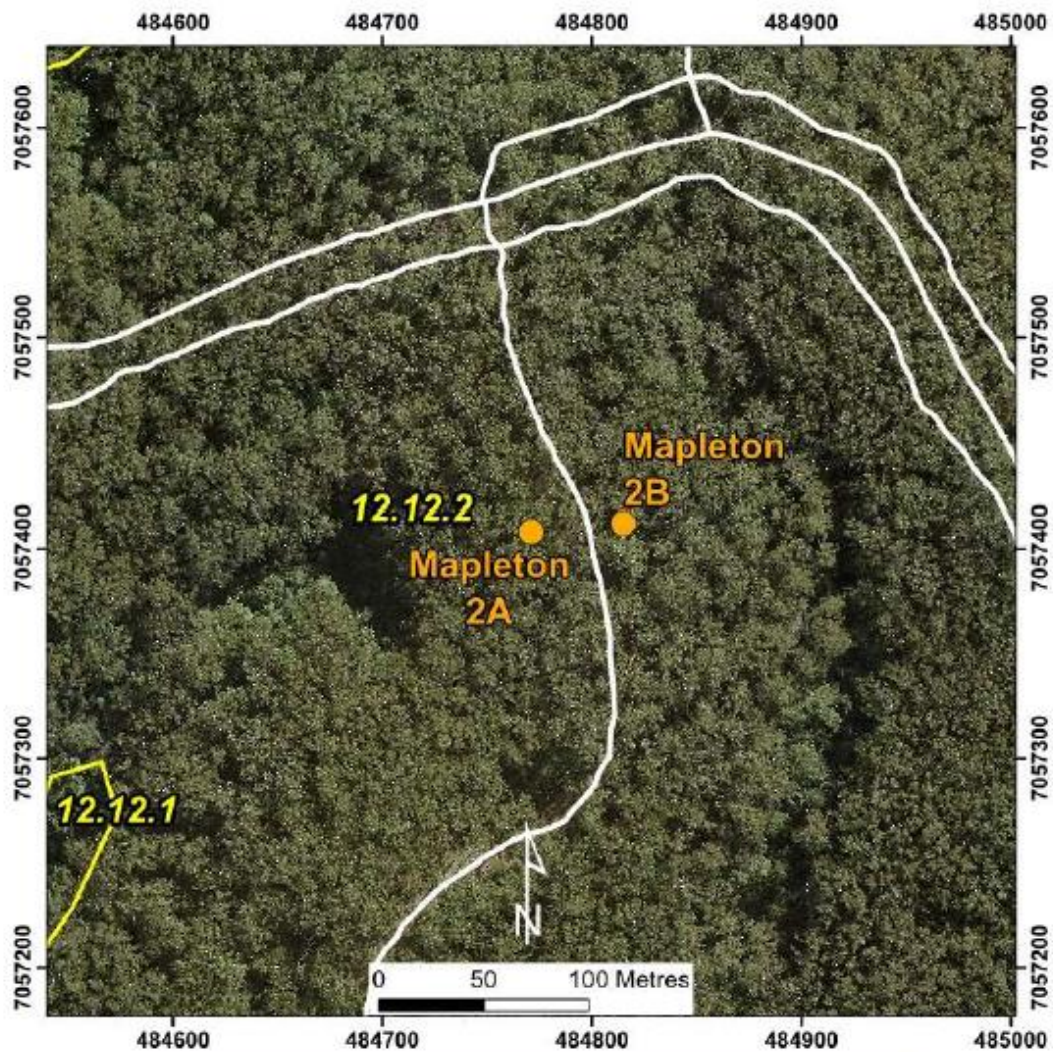
**Mapleton 2A**

Regional Ecosystem 12.12.2

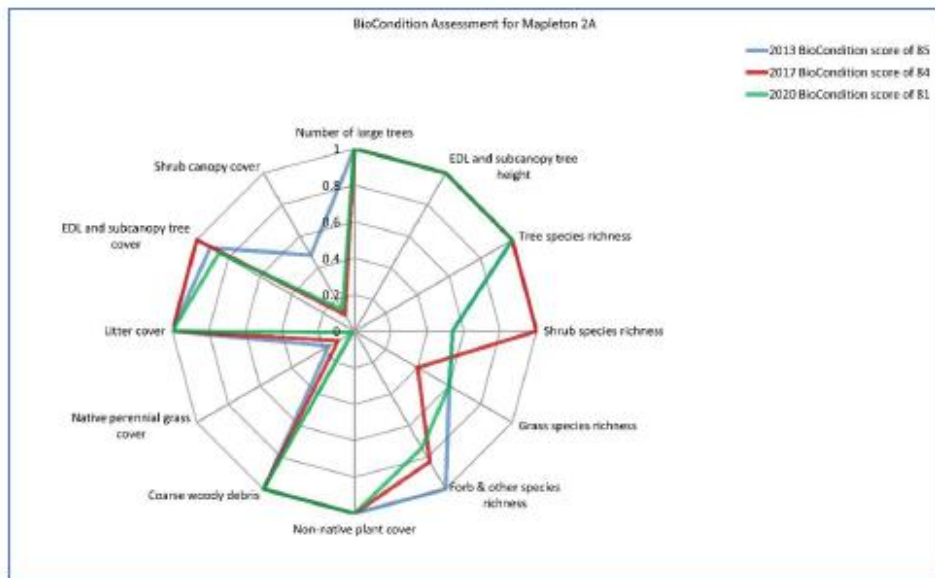
*Eucalyptus pilularis*, *Syncarpia glomulifera*, *Eucalyptus microcorys* tall open forest

Queensland Herbarium, October 2021





## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 85    2017 – 84    2020 – 81  
 Fire History: Burnt May 2020 (previous record – 1989)



Forest monitoring transect August 2017

Forest monitoring transect June 2020

General Comments: The BioCondition score for this site was consistently high. The score has declined due to decreasing shrub canopy cover and shrub, grass, forb and other ground layer species richness. Note that these values are not attributable to the hot fire of 2020 which killed or scorched many of the shrubs and low trees. Many of the T3 trees were resprouting at the base in 2021.

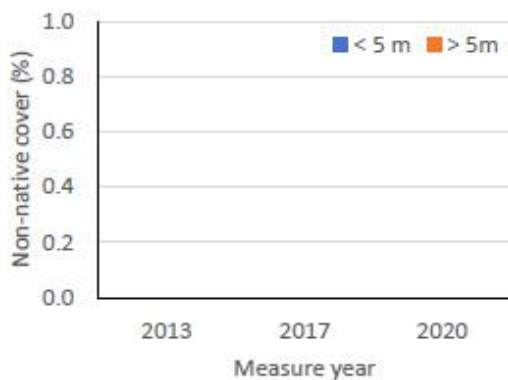


## Trail-edge ground cover transect at Mapleton 2A

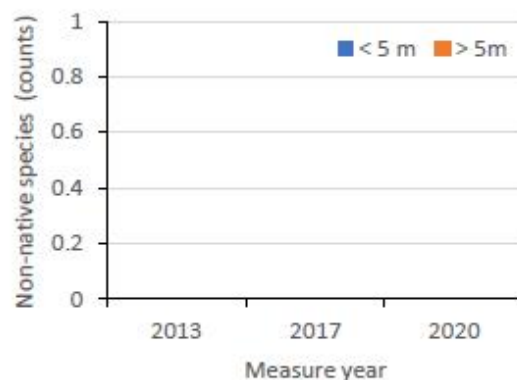


Trail-edge transect August 2017

Trail-edge transect June 2020

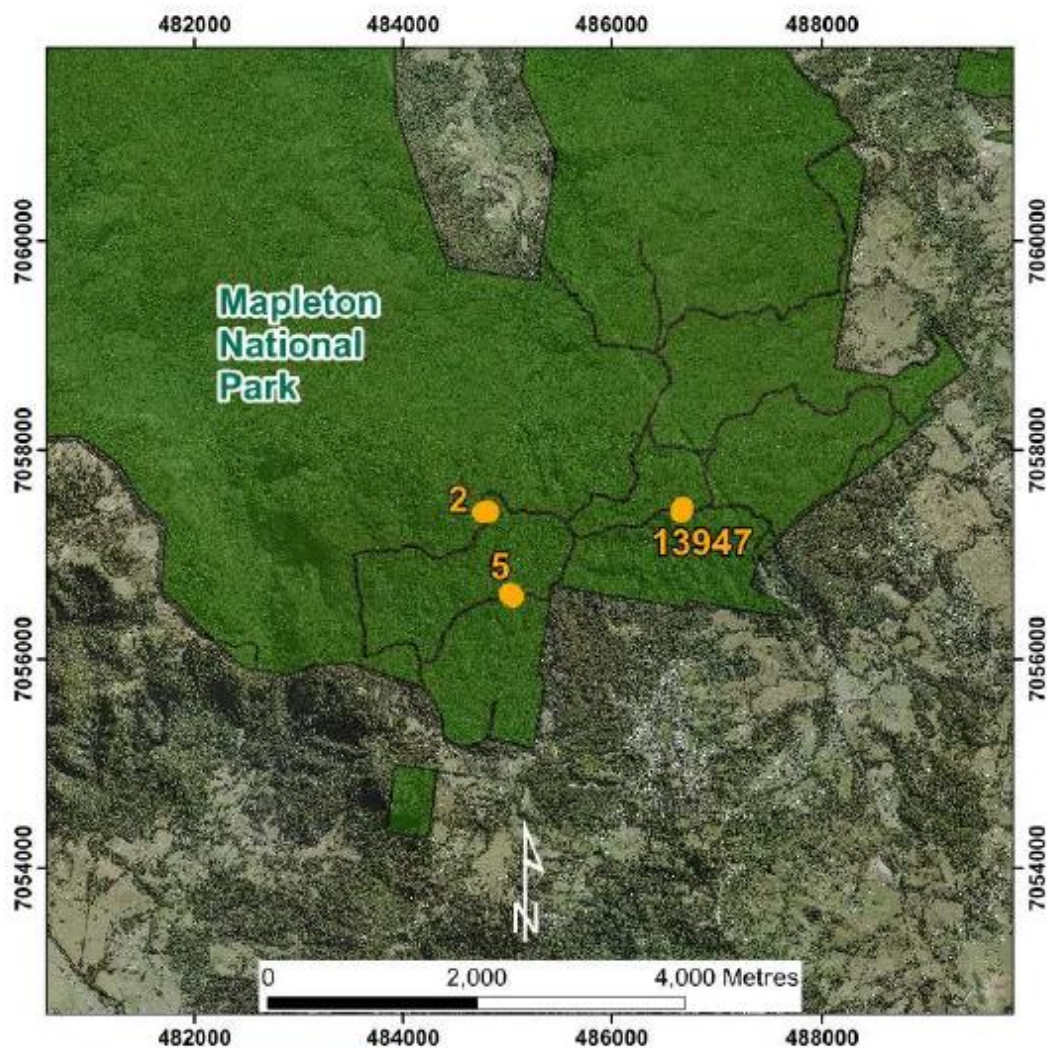


Non-native species cover



Number of non-native species

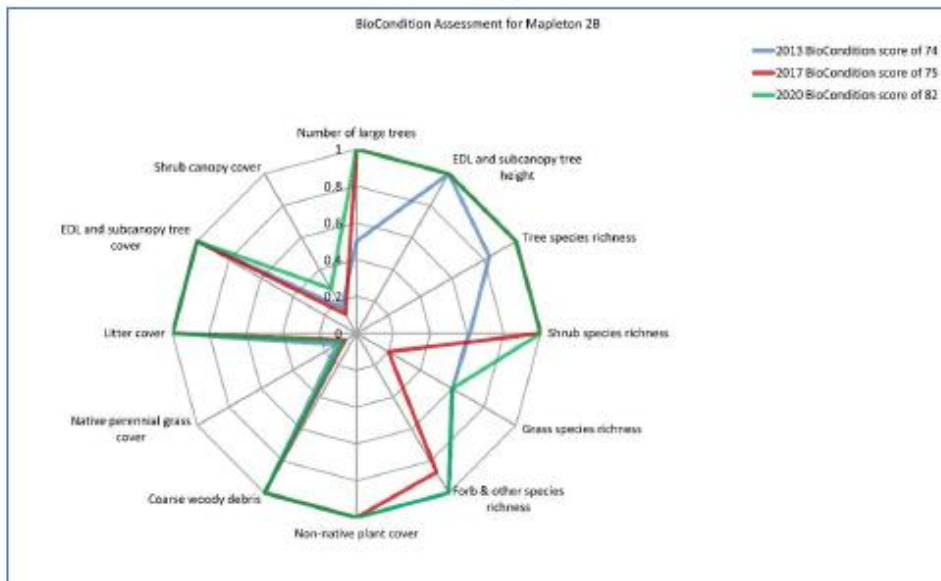
This site has maintained the highest possible score for non-native plant cover. There have been no non-native species identified on the trail-edge transect. The only non-native species recorded in the QBEIS site was camphor laurel (*Cinnamomum camphora*) at the 2013 sampling only. The trail verge was cleared up to 10 metres and covered with wood chips to act as fire break in 2015, and is regularly slashed over plant cover.



**SEQ Monitoring Report Card**  
**Mapleton 2B**  
Regional Ecosystem 12.12.2  
*Eucalyptus pilularis*, *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: 2013 – 74    2017 – 75    2020 – 82  
 Fire History: Most recent record – 1989



Forest monitoring transect August 2017

Forest monitoring transect June 2020

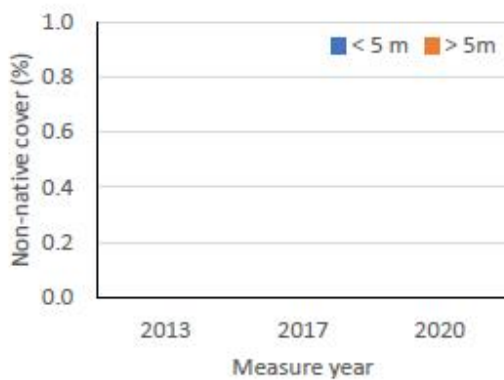
**General Comments:** The high BioCondition score for this site has improved due to increases in large tree abundance, shrub canopy cover, and tree, shrub, grass, and forb and other ground layer species richness. Shrub and perennial grass cover are still below the benchmark values. Despite no fire data since 1989, scars suggest there may have been fire more recently.

## Trail-edge ground cover transect at Mapleton 2B

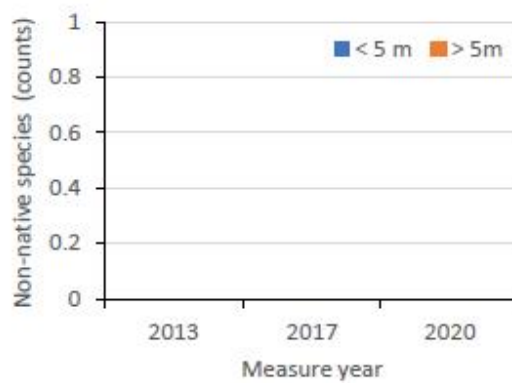


Trail edge transect August 2017

Trail edge transect June 2020



Non-native species cover

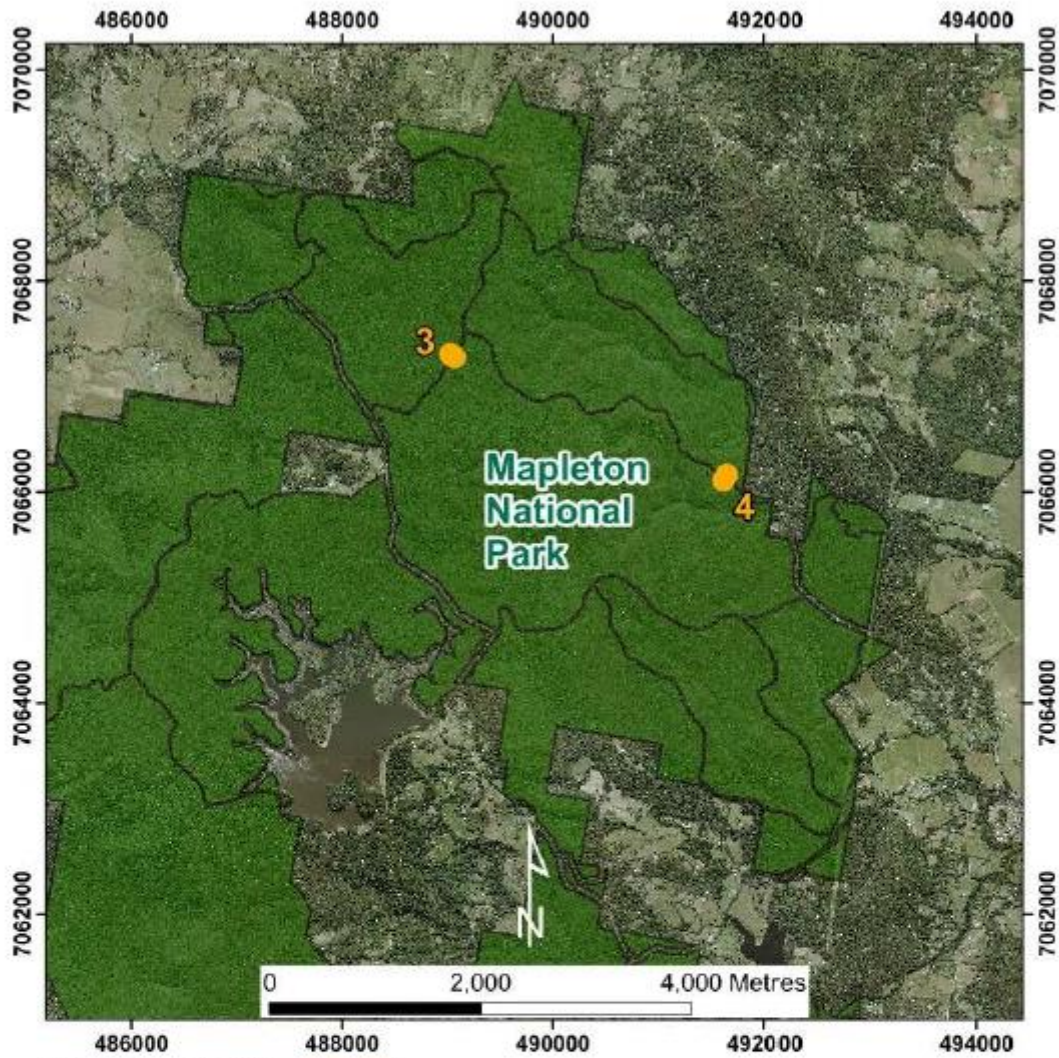


Number of non-native species

**General comments:** This site has maintained the highest possible score for non-native plant cover. There have been no non-native species identified on the ground cover transect or QBEIS site. The track verge was cleared up to 10 metres and covered with wood chips to act as fire break in 2015, and vegetation is regularly slashed.



Mapleton National Park: Site 3



**SEQ Monitoring Report Card**

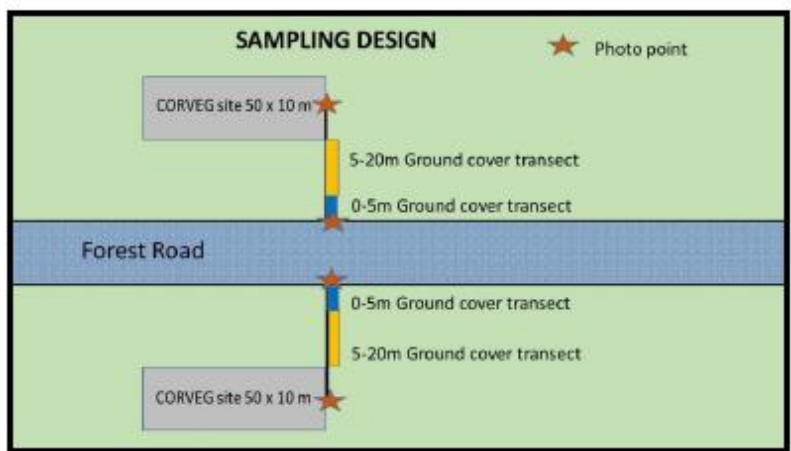
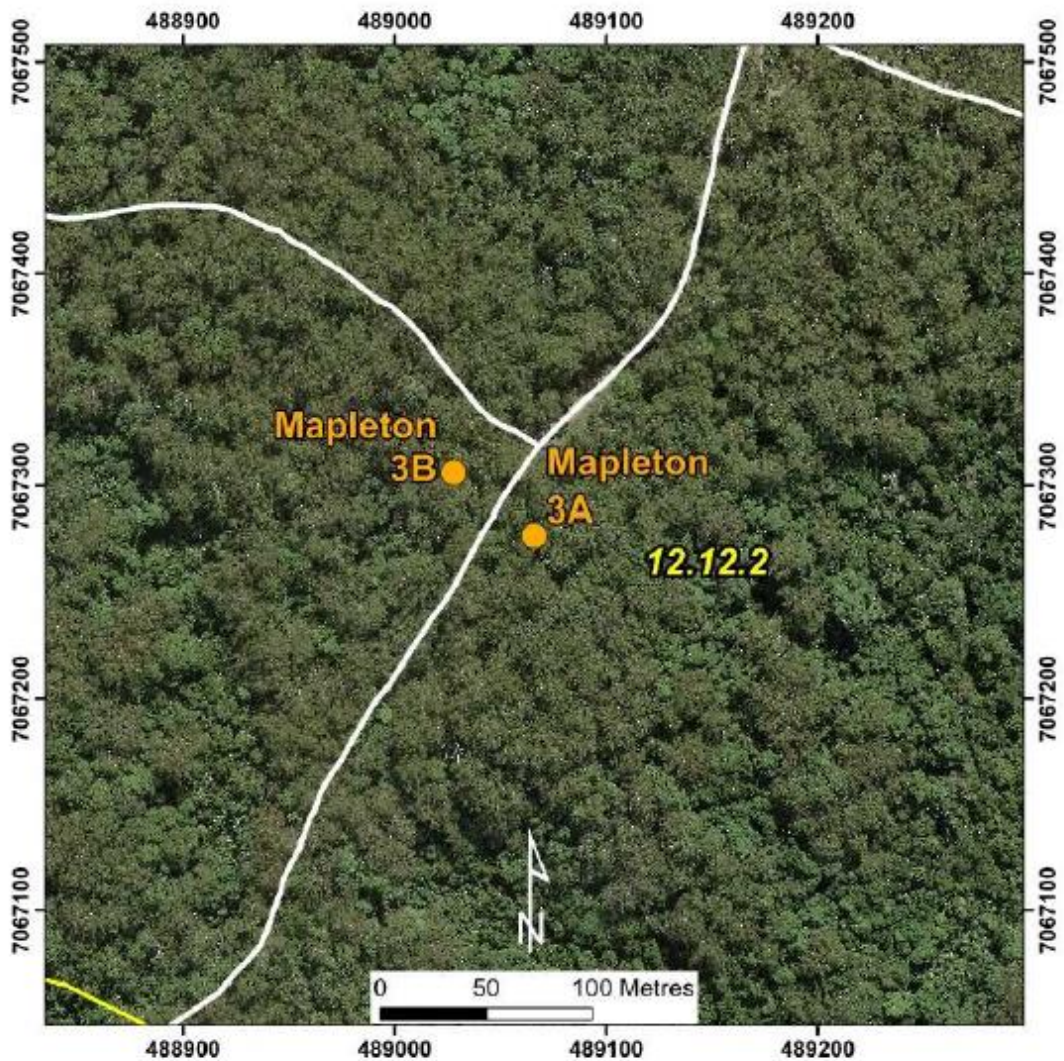
**Mapleton 3A**

Regional Ecosystem 12.12.2

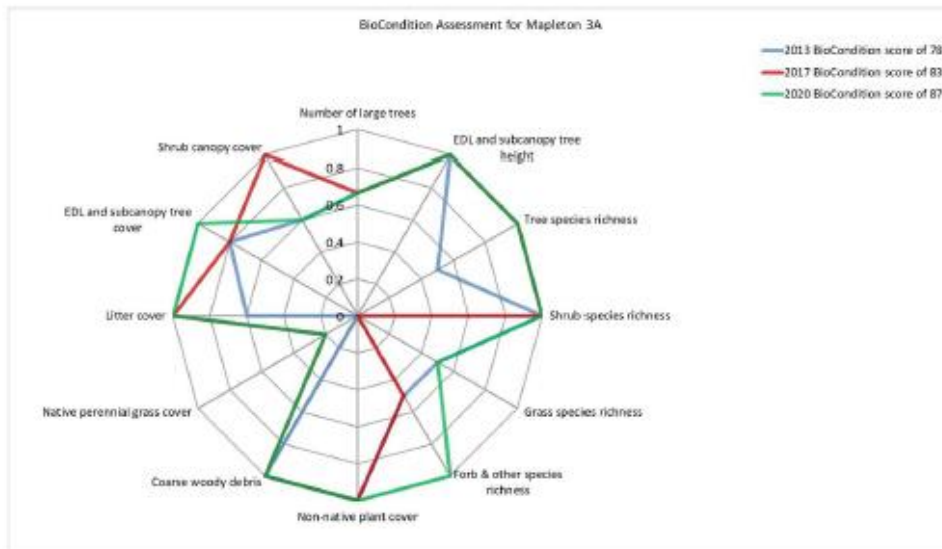
*Eucalyptus pilularis*, *Eucalyptus microcorys*, *Corymbia intermedia* open forest

Queensland Herbarium, October 2021





## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 78    2017 – 83    2020 – 87  
 Fire History: Burnt August 2014



Forest monitoring transect August 2017

Forest monitoring transect June 2020

**General Comments:** This was a former location of DYP105 and was recovering from a control burn during the 2017 visit. It has consistently had a high BioCondition score. The perennial grass cover and grass species richness were low compared to the benchmark. This may be accounted for by the high cover of ferns. No non-native species were recorded.

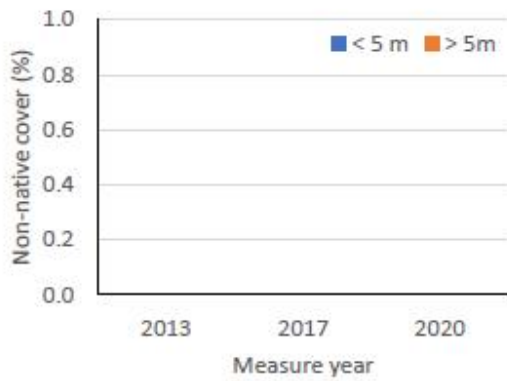


## Trail-edge ground cover transect at Mapleton 3A

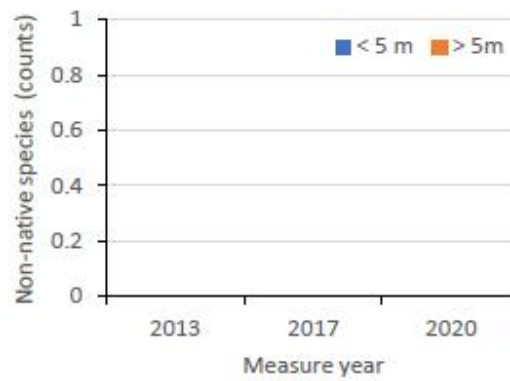


Trail edge transect August 2017

Trail edge transect June 2020

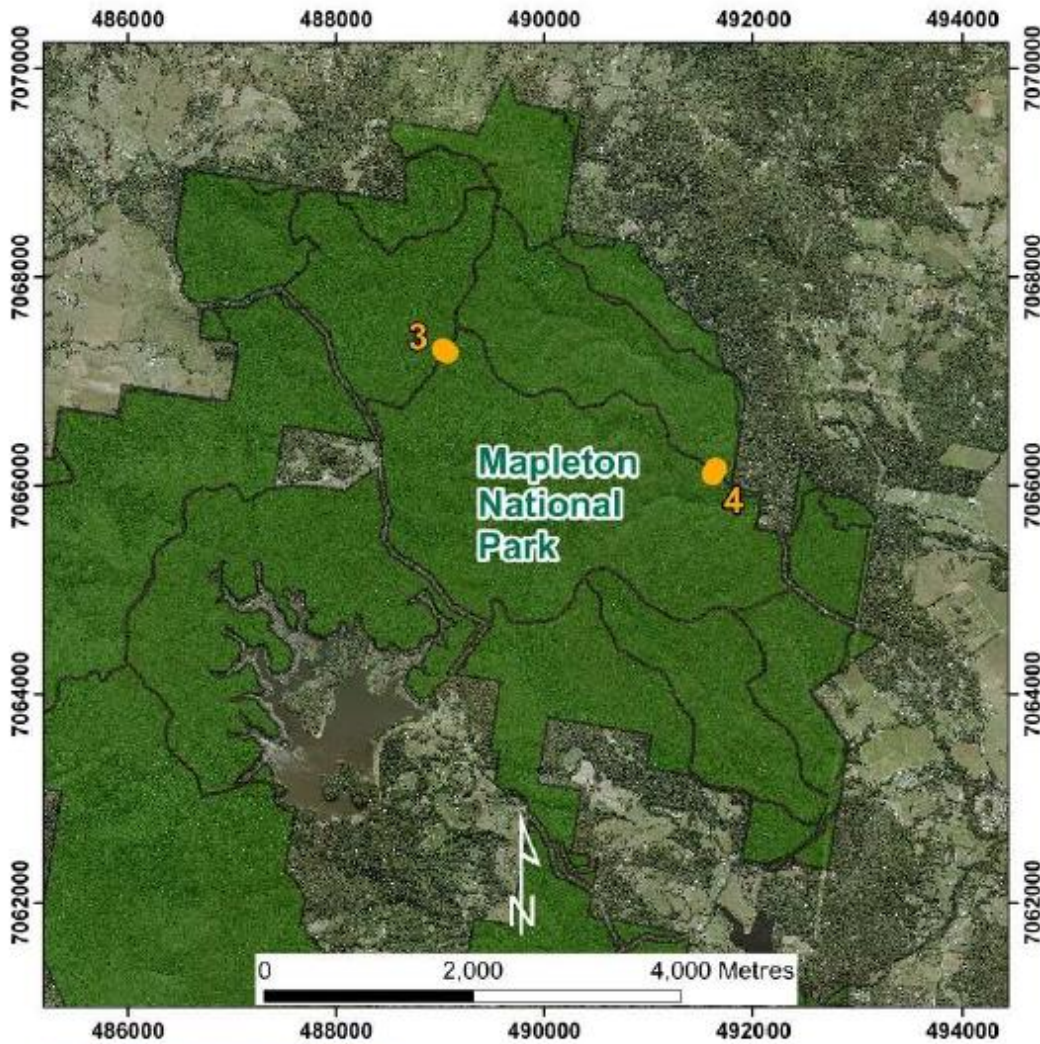


Non-native species cover



Number of non-native species

**General comments:** No non-native species were recorded in the trail-edge transect. *Lantana camara* (2013 only) and *Cinnamomum camphora* (2013 and 2017) were recorded at sparse cover levels in the QBEIS site but not in 2020.



**SEQ Monitoring Report Card**

**Mapleton 3B**

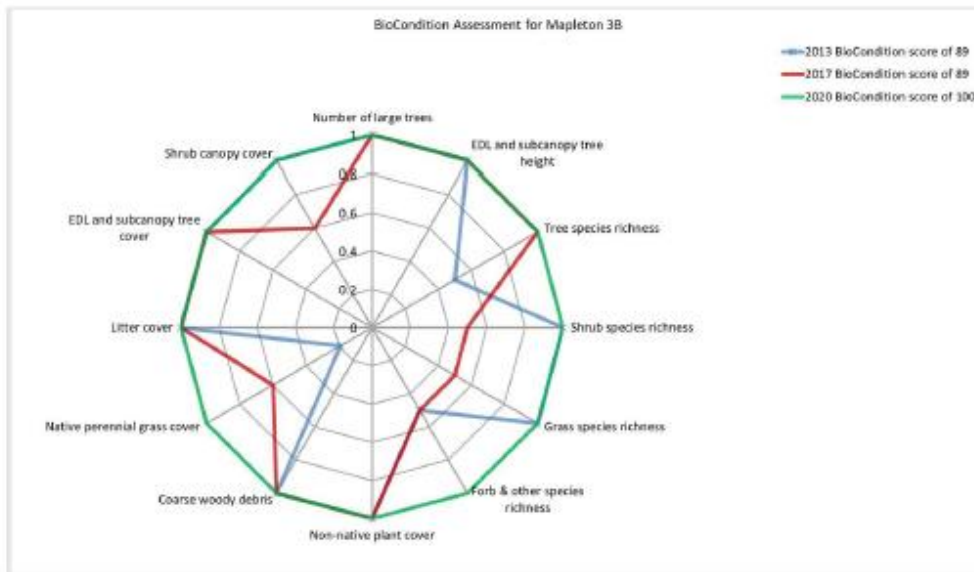
Regional Ecosystem 12.12.2

*Eucalyptus pilularis*, *Eucalyptus microcorys*, *Corymbia intermedia* tall open forest

Queensland Herbarium, October 2021



## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 89    2017 – 89    2020 – 100  
 Fire History: Burnt January 1995



Forest monitoring transect August 2017

Forest monitoring transect June 2020

**General Comments:** This site consistently had a very high BioCondition scores. While species richness values for shrubs, grasses and forbs were suboptimal in 2013 and 2017 they were optimal in 2020.

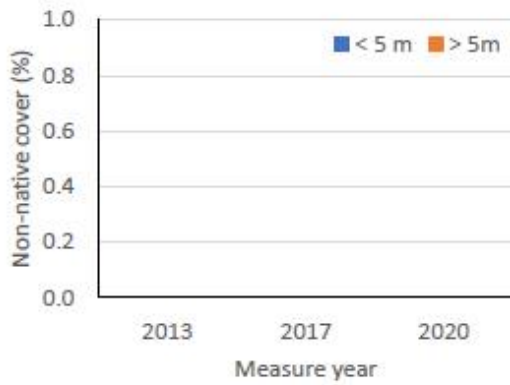


## Trail-edge ground cover transect at Mapleton 3B

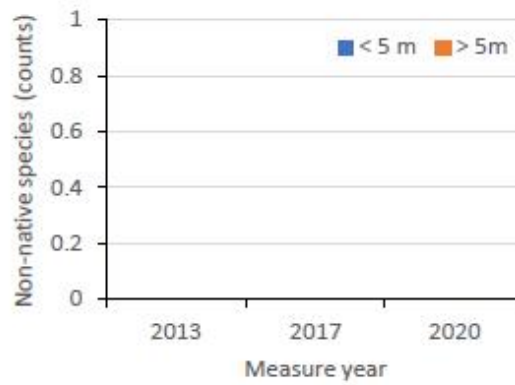


Trail edge transect August 2017

Trail edge transect June 2020

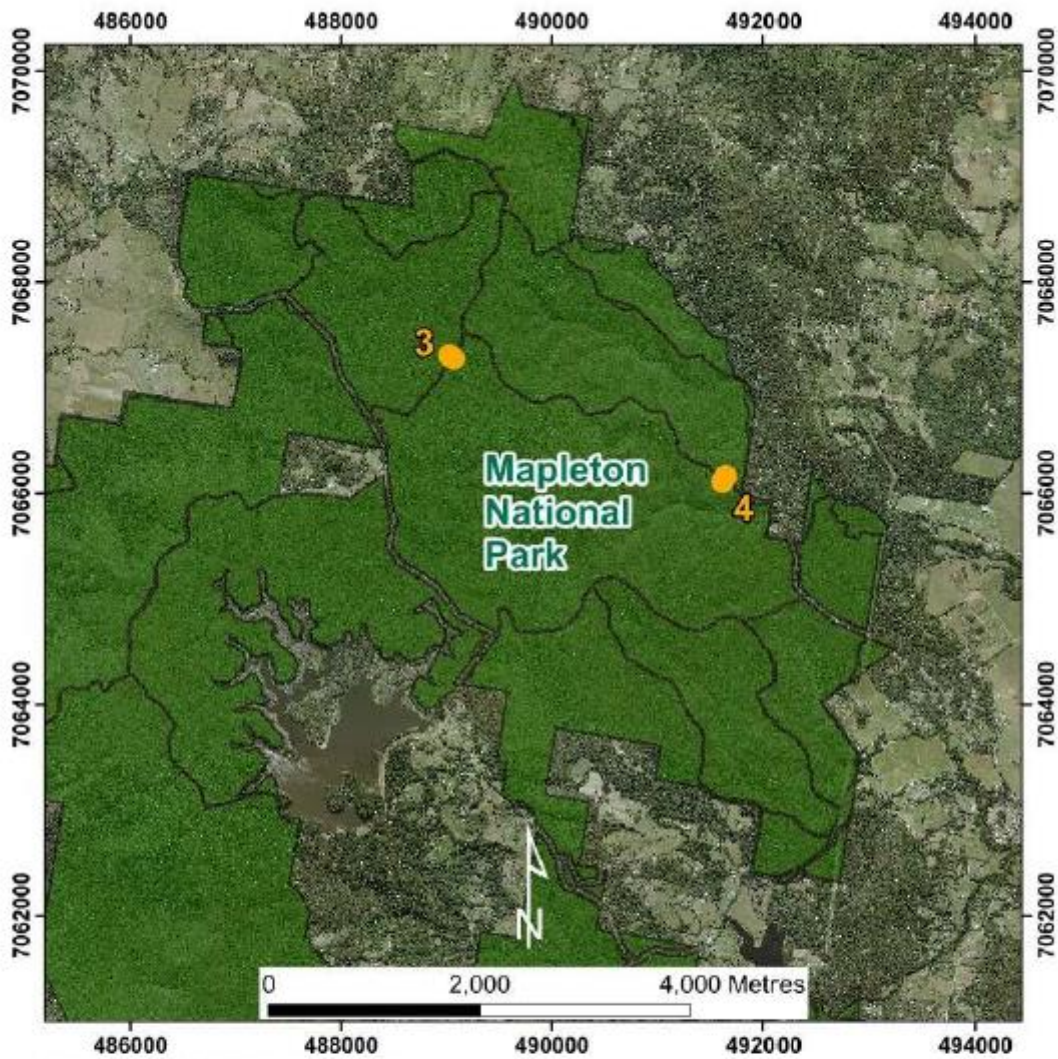


Non-native species cover



Number of non-native species

**General comments:** There were no non-native species recorded in the trail-edge transect. *Lantana camara* was consistently present with very low cover in the QBEIS site.



**SEQ Monitoring Report Card**

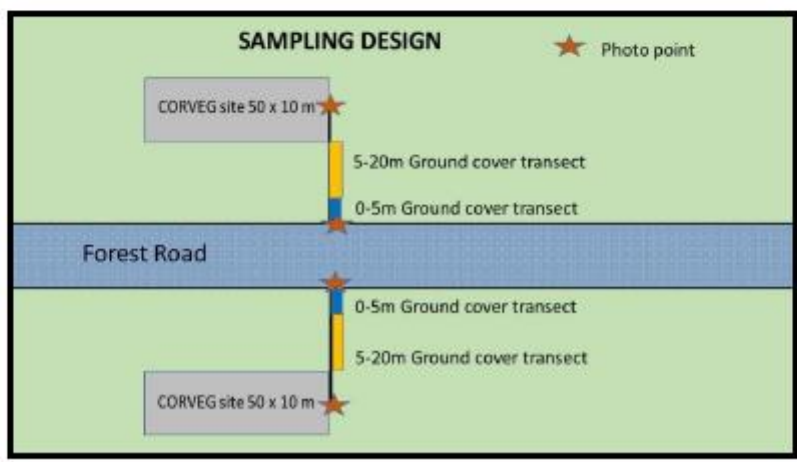
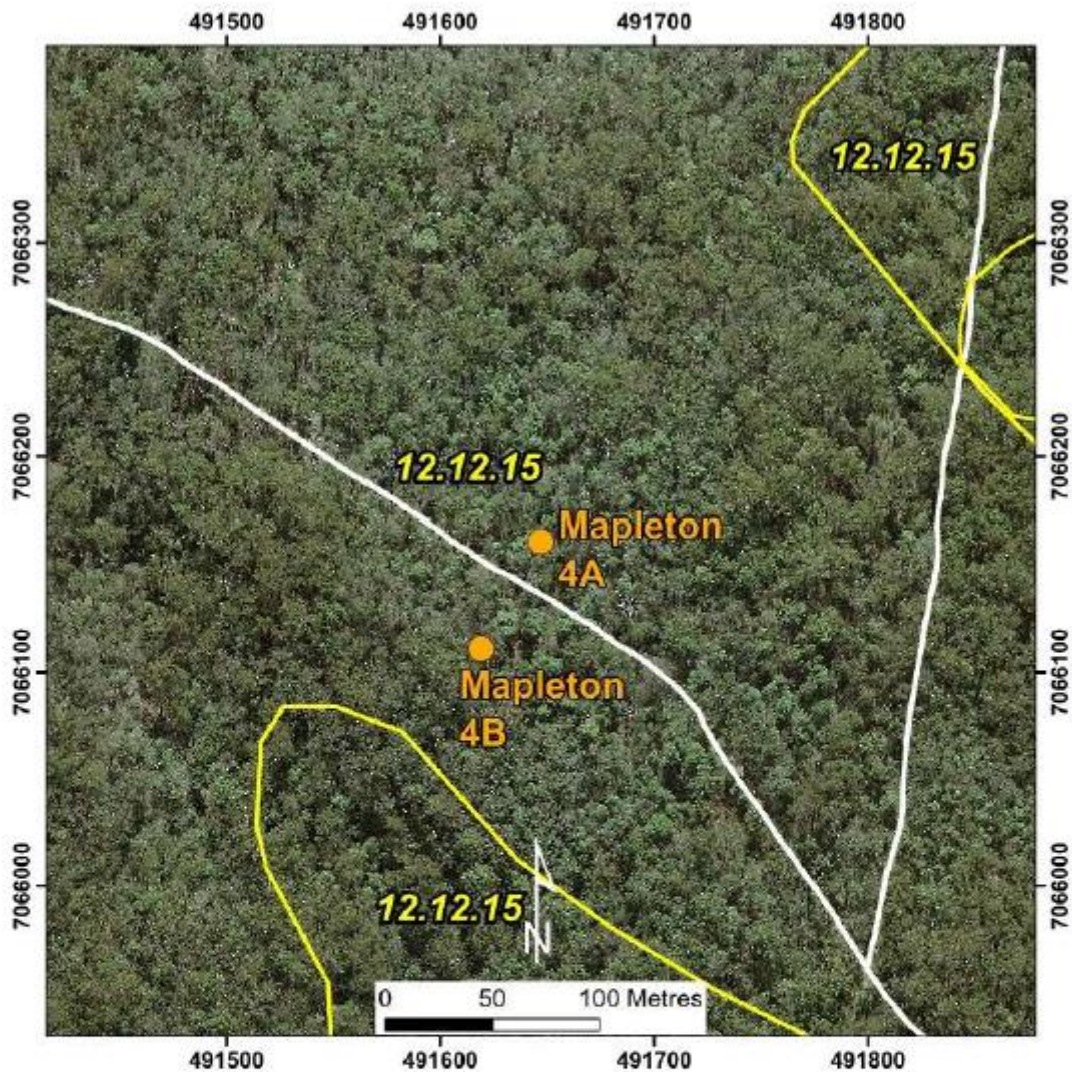
**Mapleton 4A**

Regional Ecosystem 12.12.4

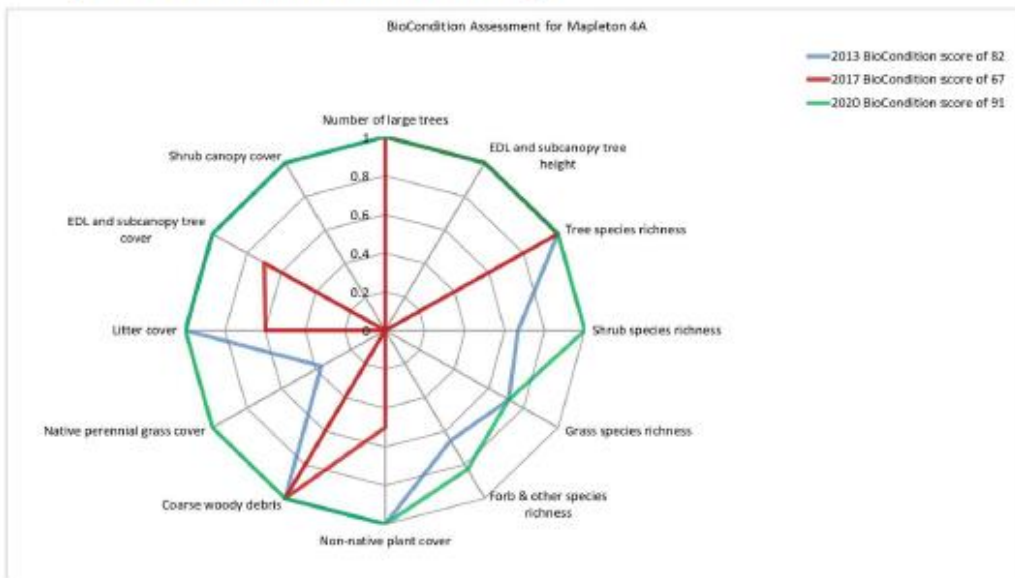
*Eucalyptus acmenoides, Syncarpia glomulifera, Lophostemon confertus*  
open forest

Queensland Herbarium, October 2021





## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 82    2017 – 67    2020 – 91  
 Fire History: Severe fire August 2017 (previous record – 1991)



Forest monitoring transect August 2017

Forest monitoring transect June 2020

General Comments: The decline in BioCondition score reflected the lack of grasses, shrubs and forbs that has all been burnt in the fire a week before. The fire also top-killed most of the T3 low tree layer, however most the *Lophostemon confertus* have resprouted and re-established a T3 layer. The site has recovered to near benchmark condition when samples in 2020 and 2021.



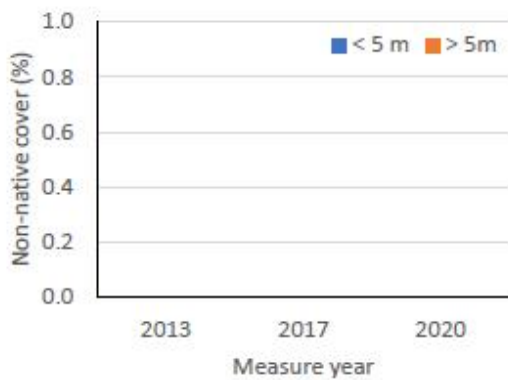
## Trail-edge ground cover transect at Mapleton 4A



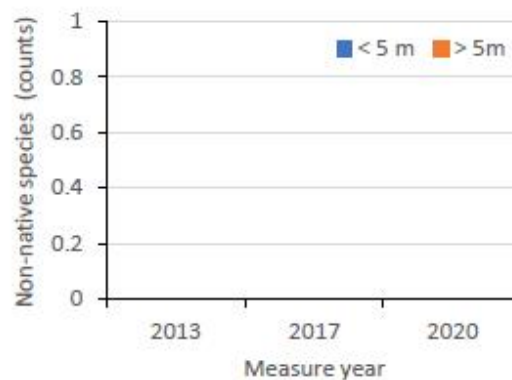
Trail-edge transect August 2017



Trail-edge transect June 2020

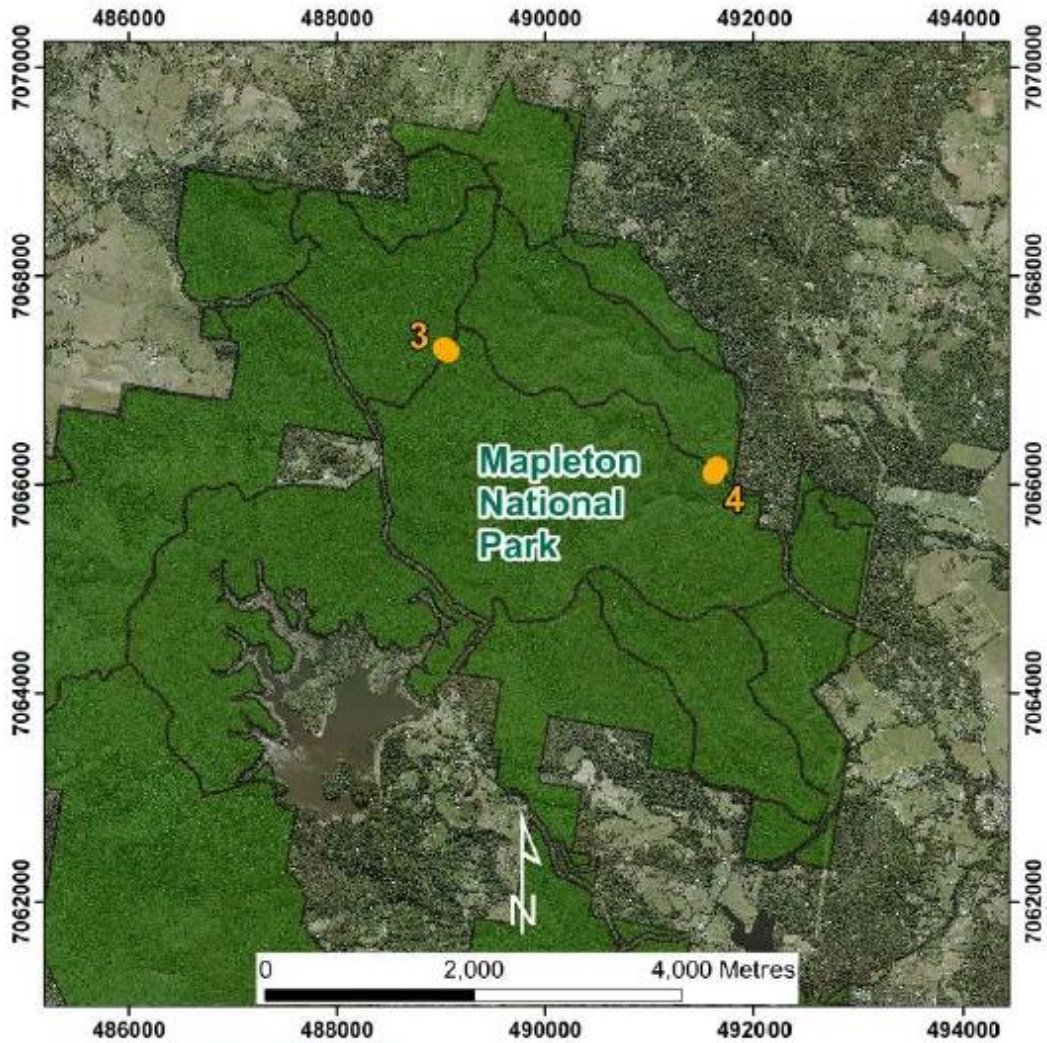


Non-native species cover



Number of non-native species

General comments: This site has maintained the highest possible score for non-native plant cover. There have been no non-native species identified on the trail-edge transect. *Cinnamomum camphora* and *Passiflora suberosa* species were recorded in the QBEIS forest site both prior and after the 2017 fire but the cover was less than 5%



**SEQ Monitoring Report Card**

**Mapleton 4B**

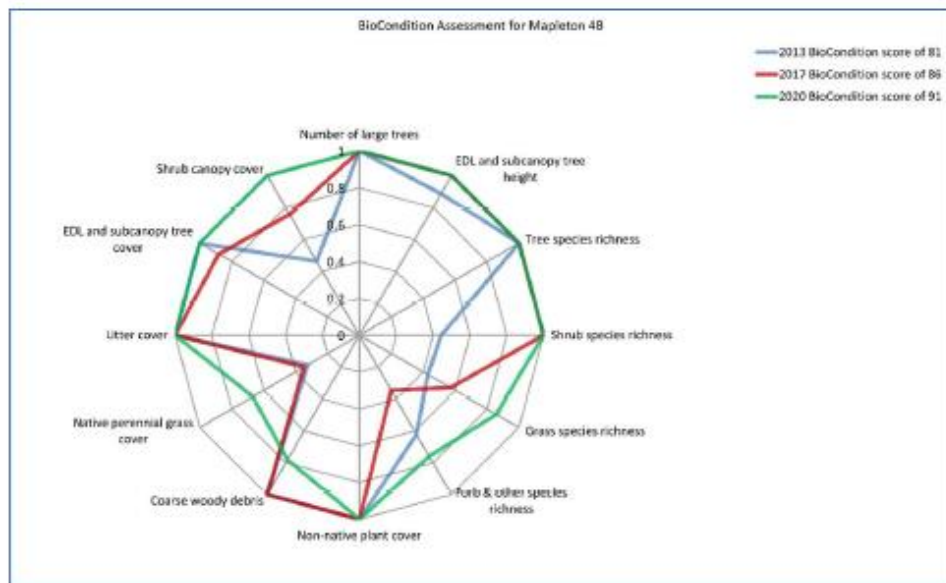
Regional Ecosystem 12.12.4

*Eucalyptus acmenoides*, *Lophostemon confertus*, *Corymbia trachyphloia*, *Syncarpia glomulifera* open forest

Queensland Herbarium, October 2021



## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 81    2017 – 86    2020 – 91  
 Fire History: Burnt August 2013



Forest monitoring transect August 2017

Forest monitoring transect June 2020

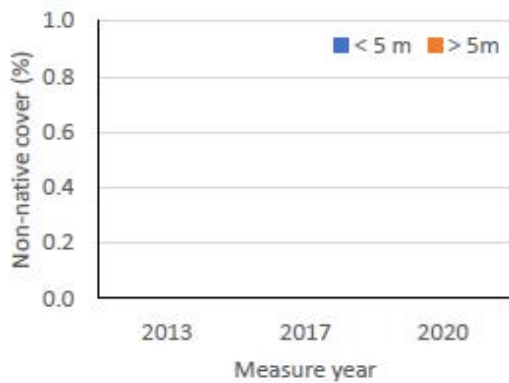
**General Comments:** This site improved on its high BioCondition score after a fire in August 2013. The perennial grass cover and shrub cover increased over time, but perennial grass cover remained suboptimal.

## Trail-edge ground cover transect at Mapleton 4B

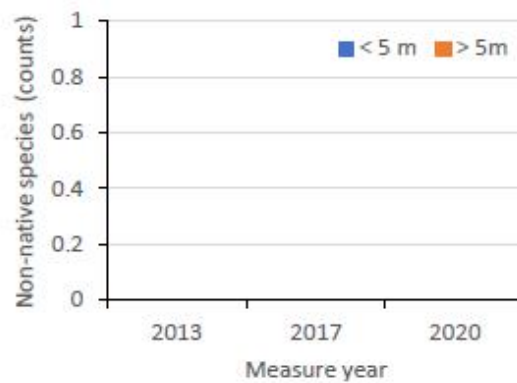


Trail-edge transect August 2017

Trail-edge transect June 2020



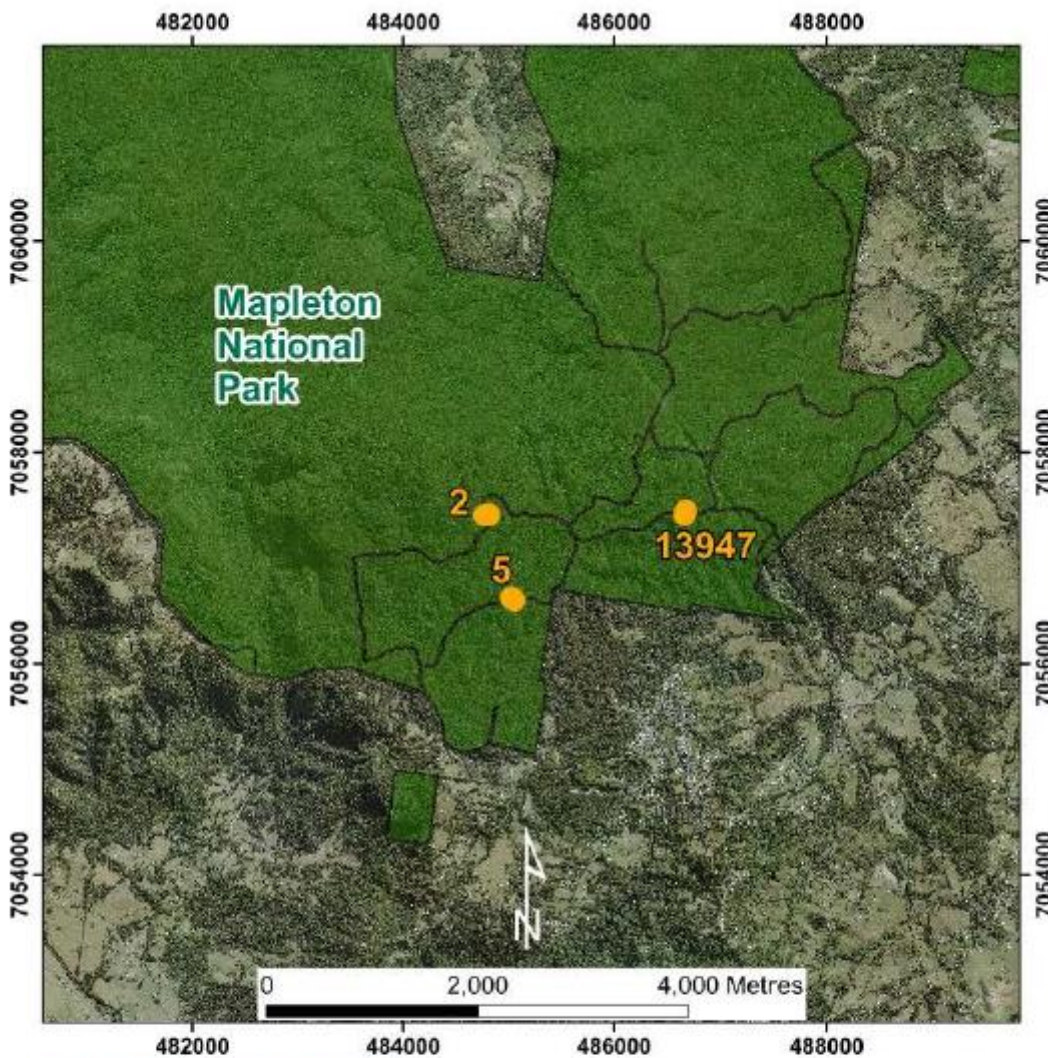
Non-native species cover



Number of non-native species

**General comments:** This site has maintained the highest possible BioCondition score. There have been no non-native species identified on the trail-edge transect or QBEIS forest site.





**SEQ Monitoring Report Card**

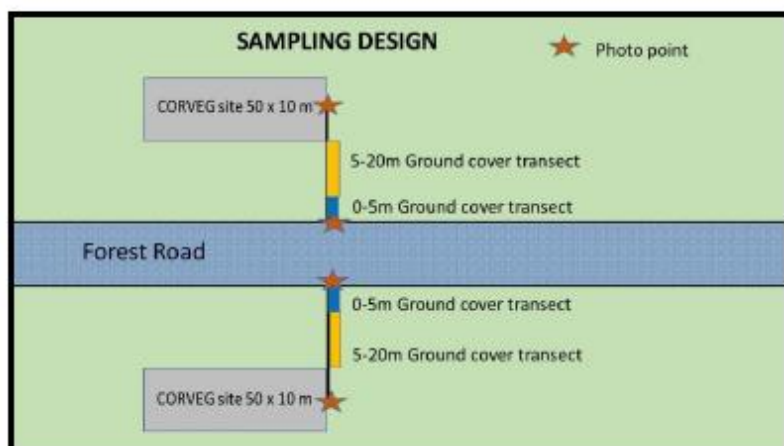
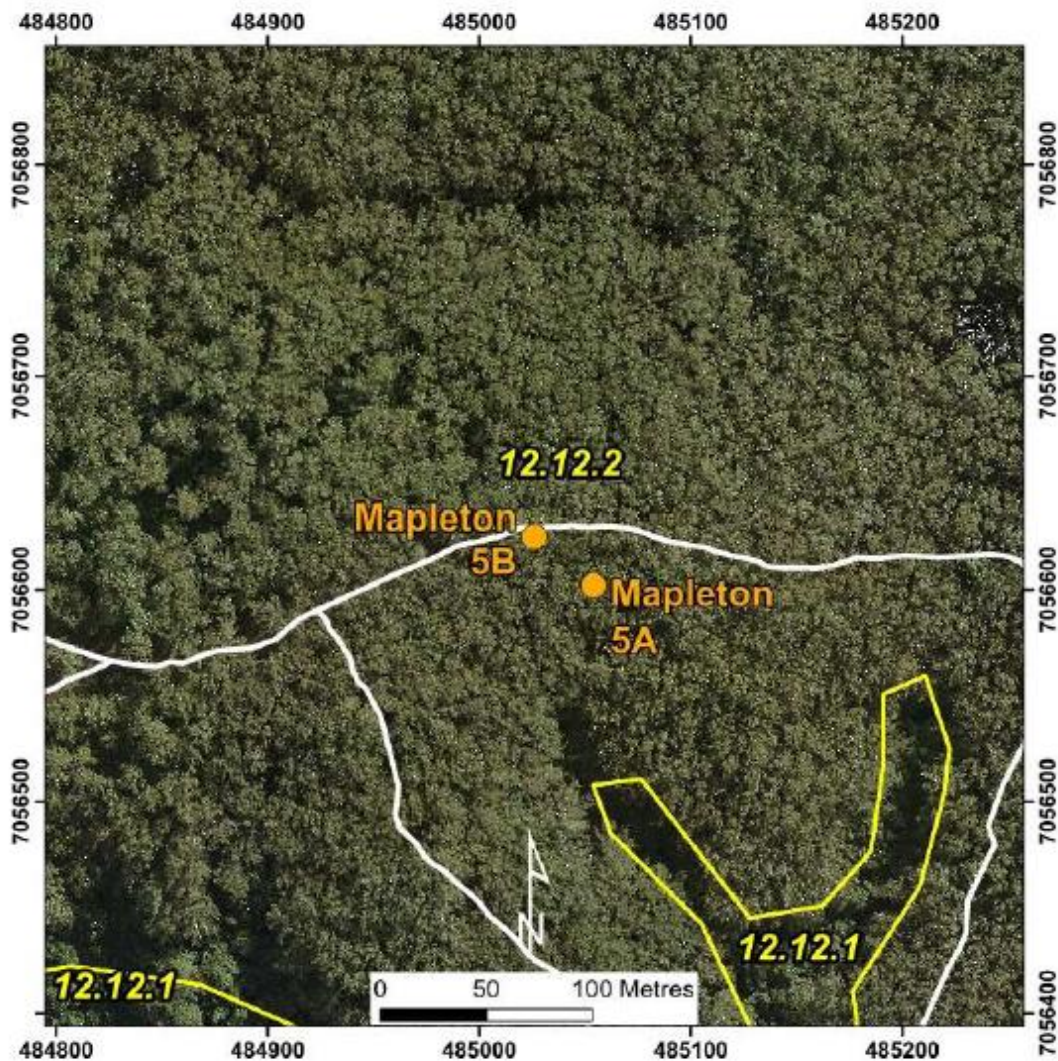
**Mapleton 5A**

Regional Ecosystem 12.12.2

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

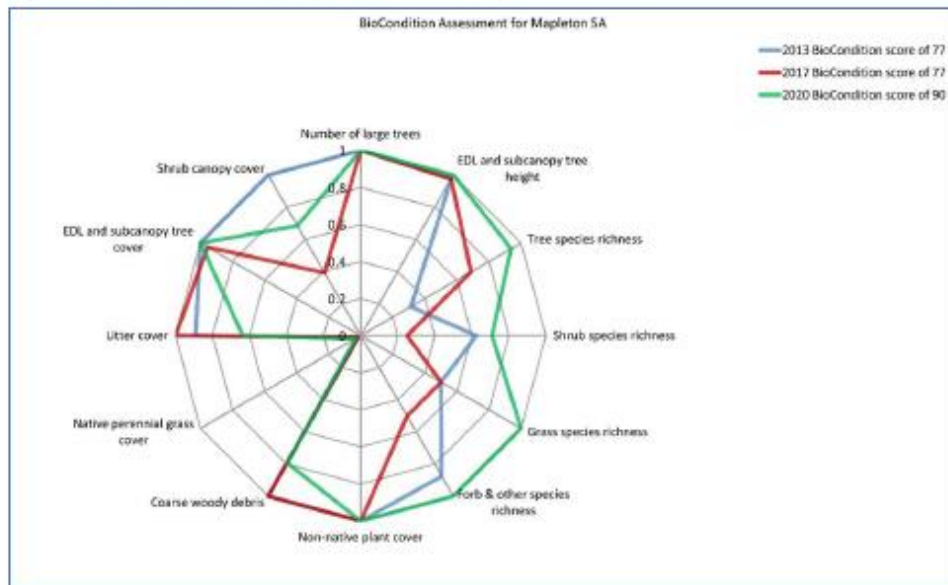
Queensland Herbarium, October 2021







## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2013 – 77    2017 – 77    2020 – 90  
 Fire History: Burnt 1989



Forest monitoring transect August 2017



Forest monitoring transect June 2020

**General Comments:** This site consistently had a high BioCondition score. The ground layer and shrub layers had low cover and species richness values in 2017 because the site had recently been burnt. However these values had recovered to Benchmark values by the 2020 sampling. The relative high cover of T2 and T3 trees reduces the amount of light on the ground leading to lower values for perennial grass cover.

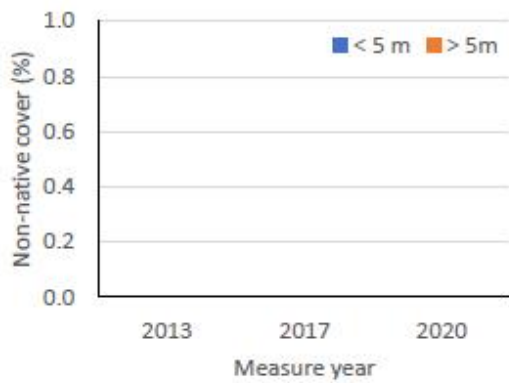
## Trail-edge ground cover transect at Mapleton 5A



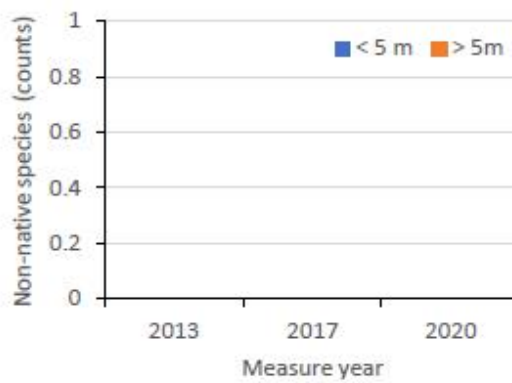
Trail edge transect August 2017



Trail edge transect June 2020



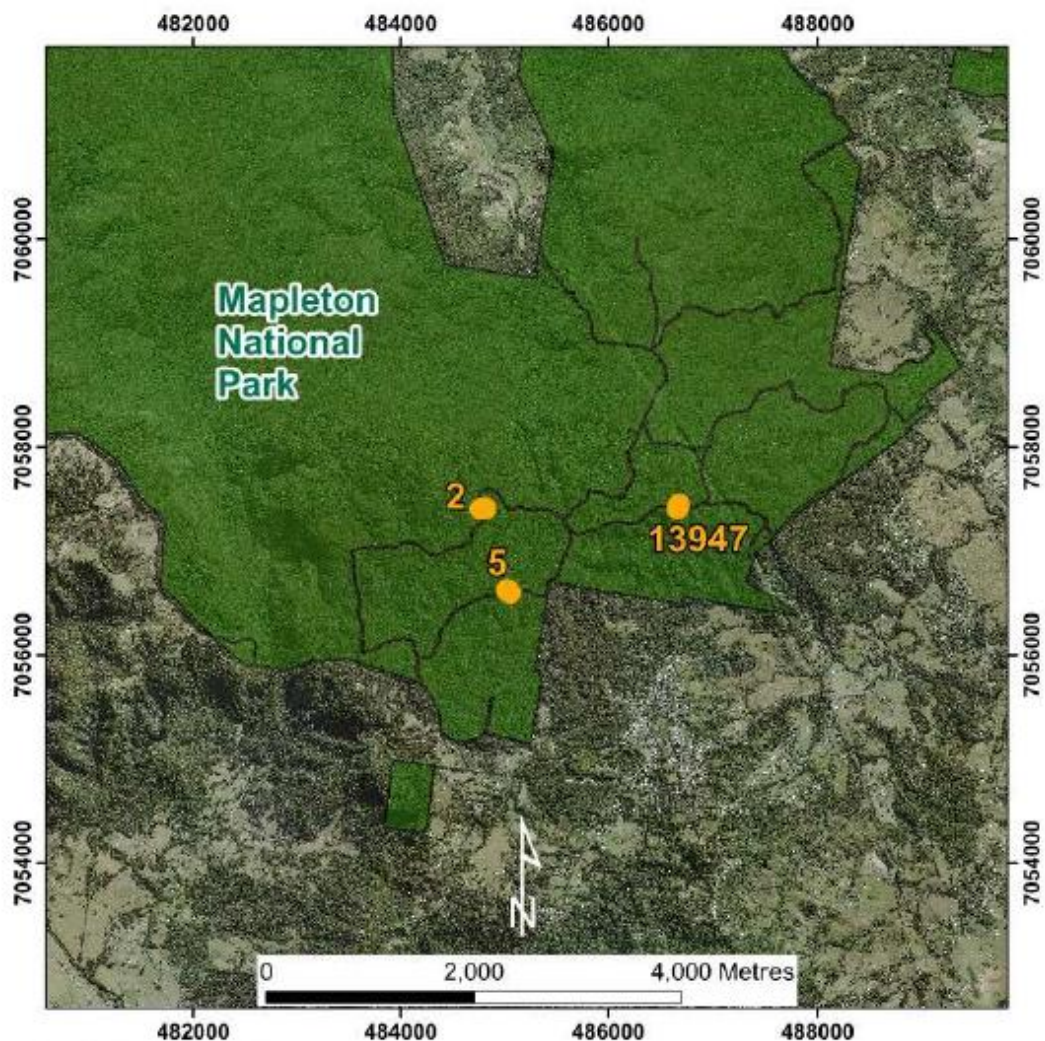
Non-native species cover



Number of non-native species

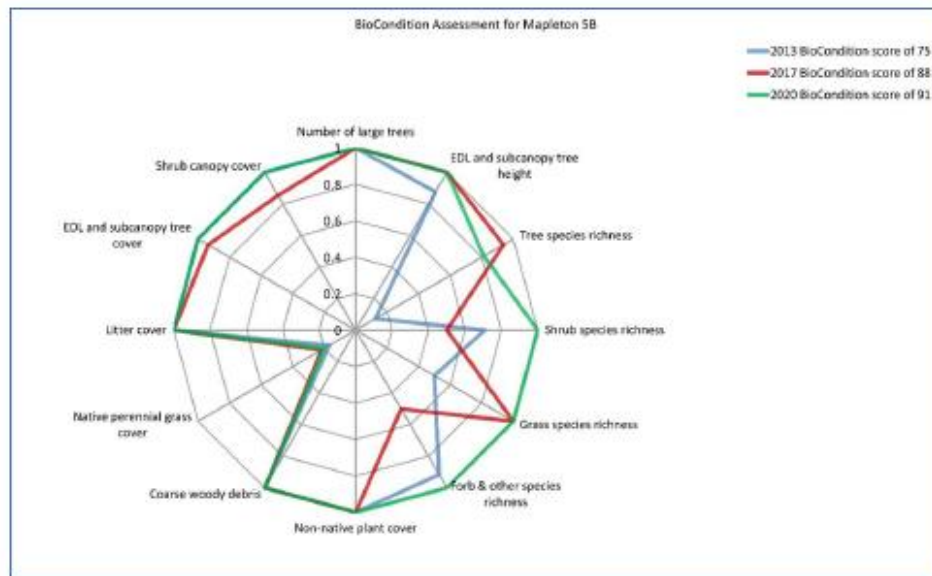
**General comments:** There have been no non-native species identified on the trail-edge transect or QBEIS site. The track verge was cleared up to 10 metres in 2015 for firebreak and the wood was chipped and used as mulch. The trail edge is regularly slashed to reduce plant cover.





**SEQ Monitoring Report Card**  
**Mapleton 5B**  
Regional Ecosystem 12.12.2  
*Eucalyptus pilularis*, *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: 2013 – 75    2017 – 88    2020 – 91  
 Fire History: Burnt July 1995



Forest monitoring transect August 2017

Forest monitoring transect June 2020

General Comments: This site consistently had a high BioCondition score. Tree, shrub and grass species richness improved over the monitoring period but native perennial grass cover remained very low. This is possibly because of the dense litter cover and long period since the last fire in 1995.

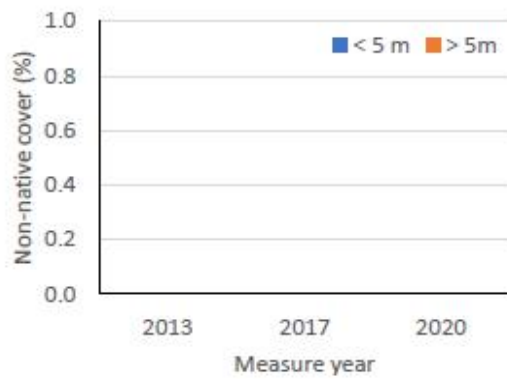


## Trail-edge ground cover transect at Mapleton 5B

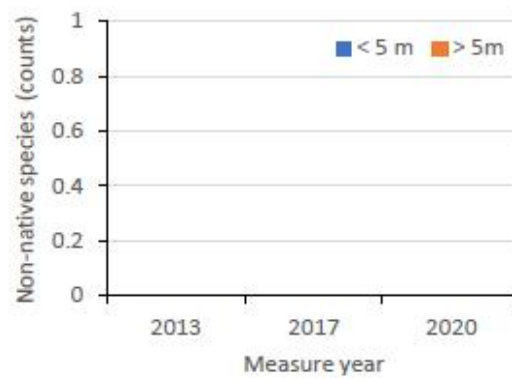


Trail edge transect August 2017

Trail edge transect June 2020

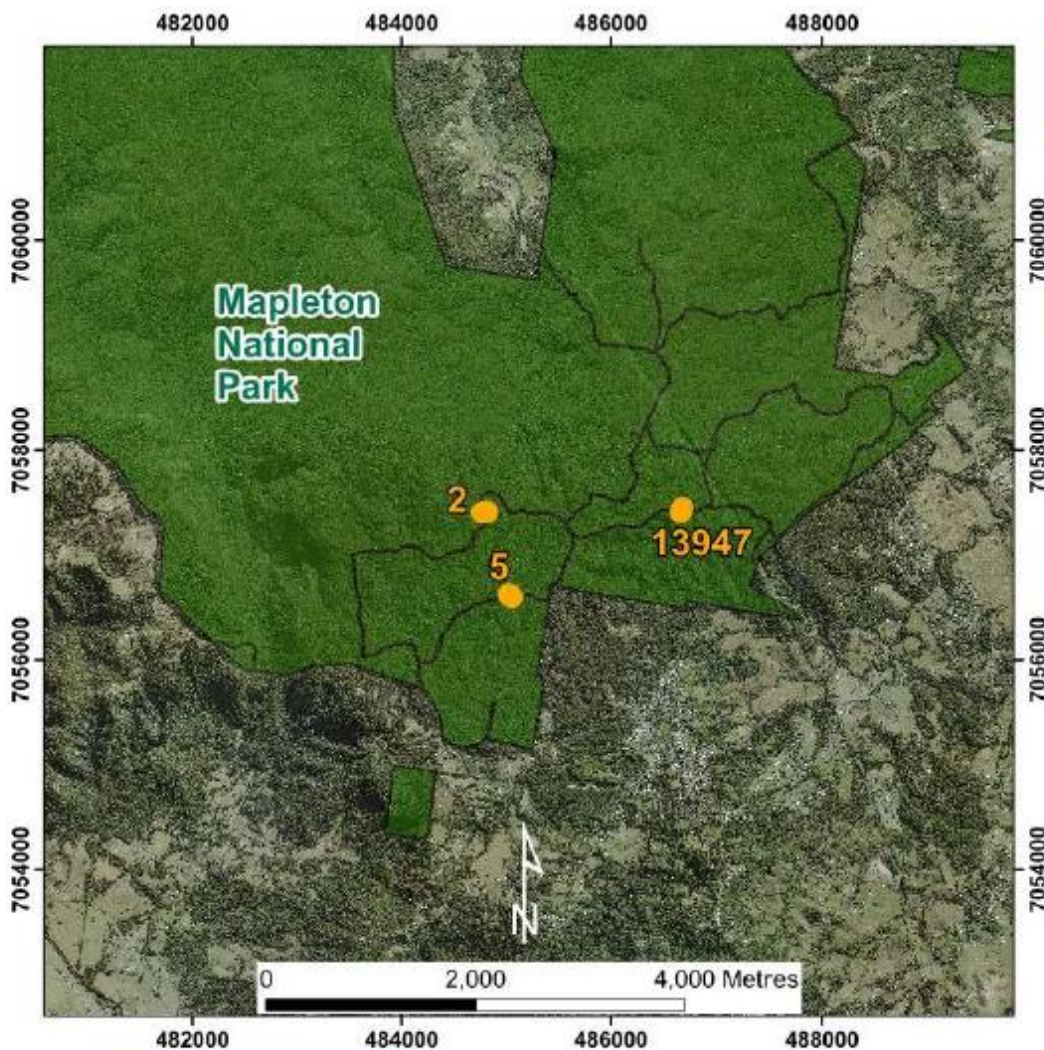


Non-native species cover



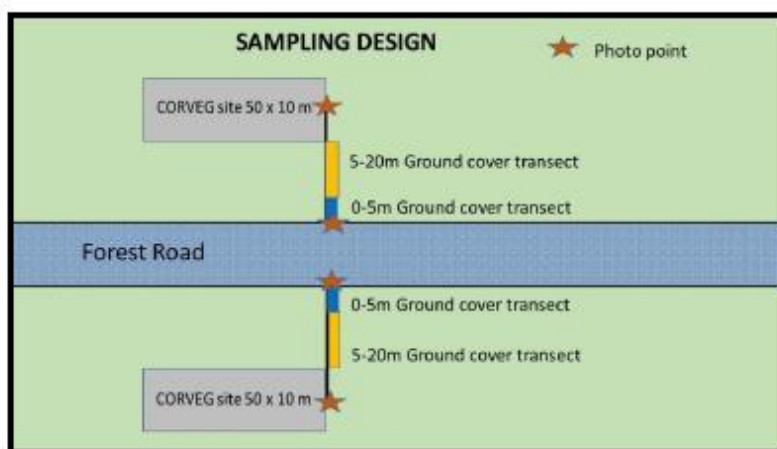
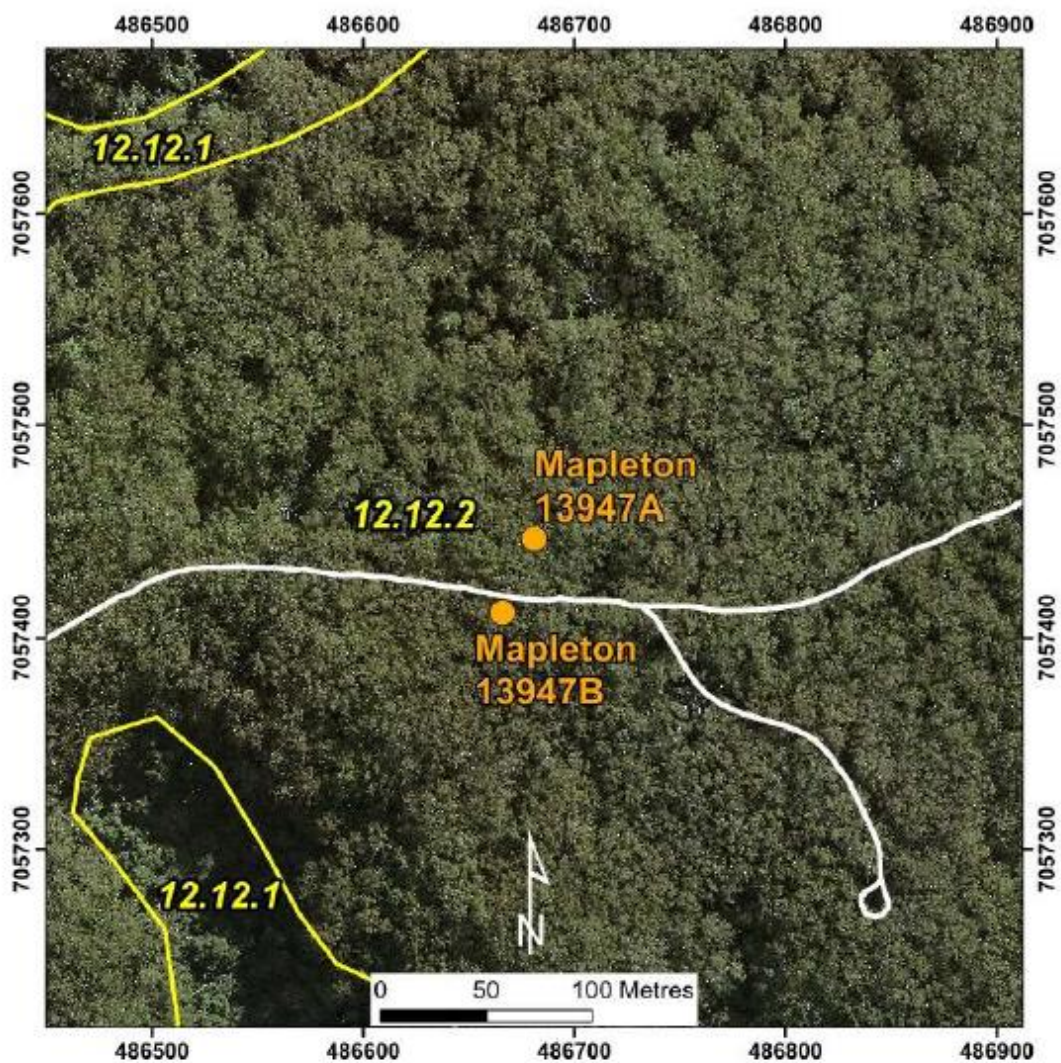
Number of non-native species

There have been no non-native species identified on the trail edge transect or QBEIS site.



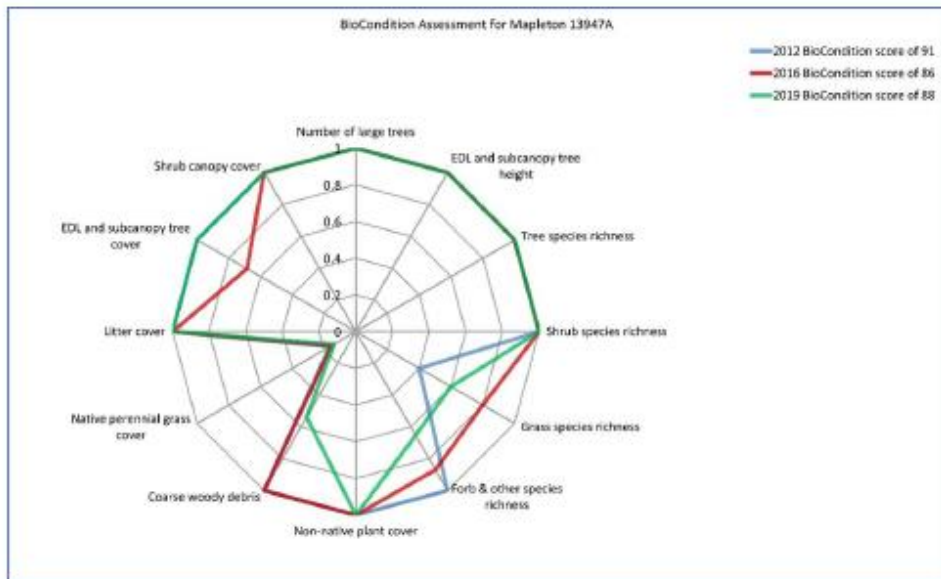
**SEQ Monitoring Report Card**  
**Mapleton 13947A**  
Regional Ecosystem 12.12.2  
*Eucalyptus pilularis*, *Syncarpia glomulifera*, *Eucalyptus microcorys* tall open forest  
Queensland Herbarium, October 2021







## QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled  
 BioCondition scores: 2012 – 91    2016 – 86    2019 – 88  
 Fire History: Burnt September 2013 (sample 2016 suggests fire <1yr prior)



Forest monitoring transect September 2016    Forest monitoring transect September 2019

**General Comments:** This site consistently had a very high BioCondition score. The perennial grass cover and grass species richness were consistently below benchmark values, which may be caused by the high cover of *Pteridium esculentum*. No non-native species were recorded at this location.

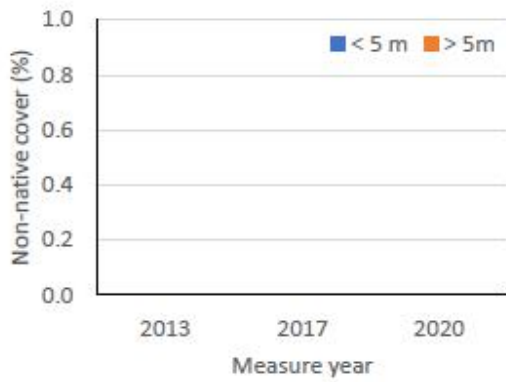
## Trail-edge ground cover transect at Mapleton 13947A



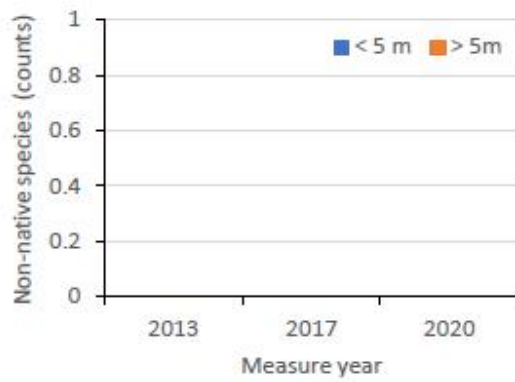
Trail-edge transect September 2016



Trail-edge transect September 2019



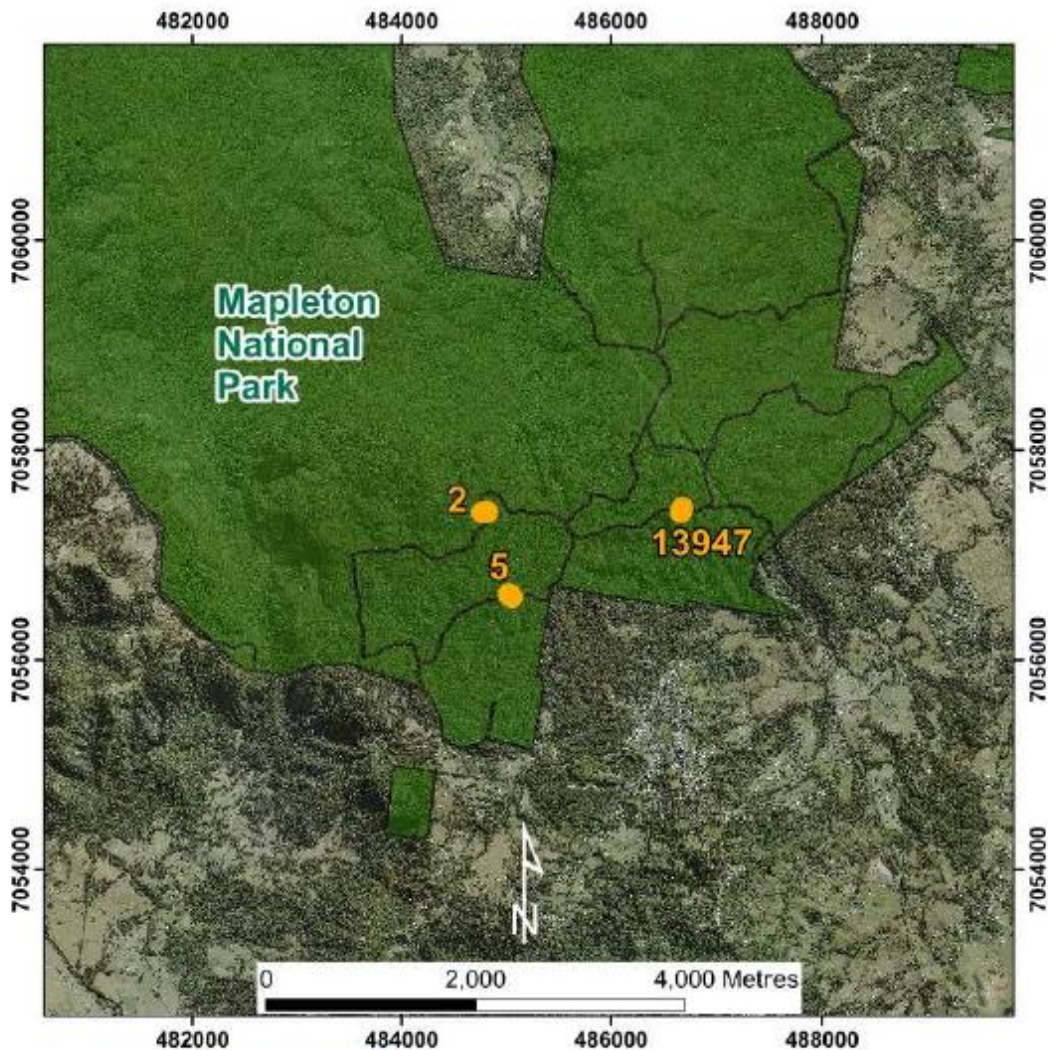
Non-native species cover



Number of non-native species

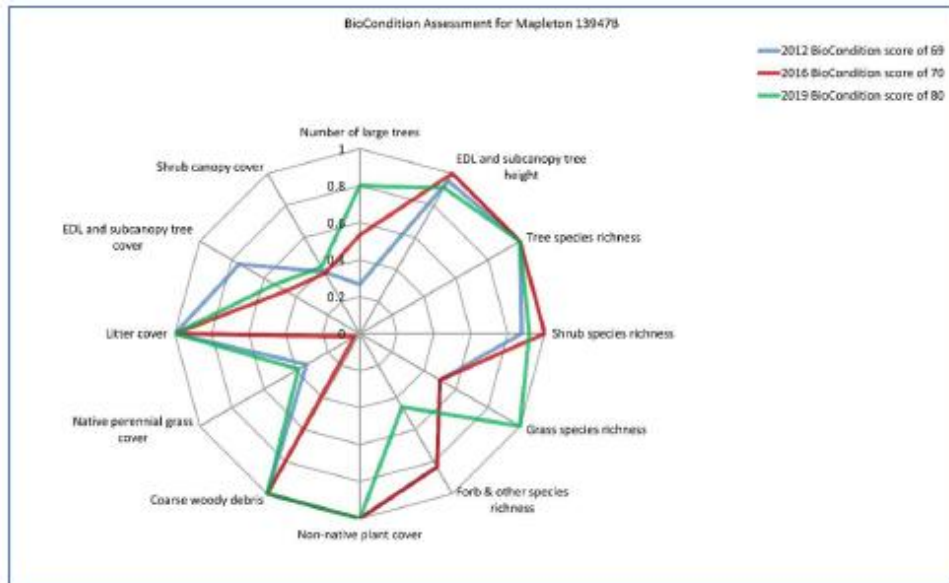
**General comments:** There were no non-native species in the trail-edge transect at any of the samplings.





**SEQ Monitoring Report Card**  
**Mapleton 13947B**  
Regional Ecosystem 12.12.2  
*Eucalyptus pilularis*, *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 – 69    2016 – 70    2019 – 80  
 Fire History: Burnt 1995



Forest monitoring transect September 2016    Forest monitoring transect September 2019

**General Comments:** This site consistently had a moderately high BioCondition score that was constrained by the lack of large trees. The rainforest subcanopy layer reduced the amount of light reaching the ground, and contributed to the low cover of perennial grasses, shrubs and forbs.

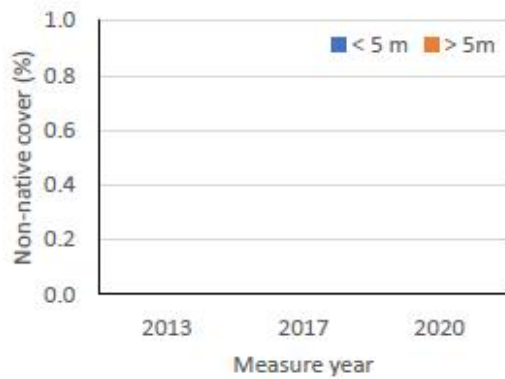


## Trail-edge ground cover transect at Mapleton 13947B

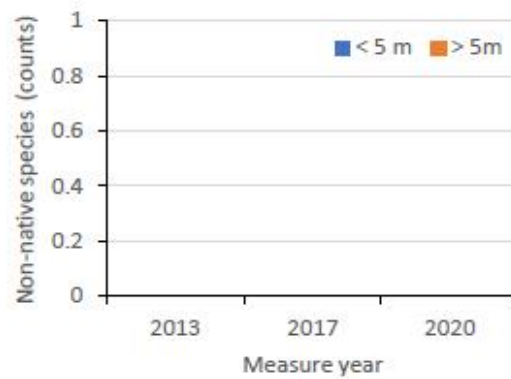


Trail-edge transect September 2016

Trail-edge transect September 2019



Non-native species cover



Number of non-native species

**General comments:** There were no non-native species in the trail-edge transect on the QBEIS at any of the samplings.

## 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.



12.12.2a: *Eucalyptus pilularis* tall open forest on Mesozoic to Proterozoic igneous rocks



<b>Mapping data</b>	No data available.
<b>Species richness</b>	total: 344 (37 sites); woody: 162 (37 sites); ground: 263 (36 sites); average spp./site: 42.5, standard deviation: 7.9 (36 sites)
<b>Basal area</b>	average/site: 25.8 m <sup>2</sup> /ha; range: 16.0 - 41.0 m <sup>2</sup> /ha; std. deviation: 6.2; (37 sites)
<b>Ecological dominant layer (EDL) height</b>	stratum: tree 1; average/site: 32.96m; range: 18.00 - 50.00m; (37 sites)
<b>Ecological dominant layer (EDL) Crown Cover</b>	stratum: tree 1; average: 59.1%; range: 25.0 - 100.0%; (37 sites)
<b>Structural formation</b>	Tall Open Forest: 64.9 %; Open Forest: 21.6 %; Woodland: 8.1 %; Tall Woodland: 2.7 %; Tall Closed Forest: 2.7 %; (37 sites)
<b>Representative site(s)</b>	1982, 3089, 3090, 3093, 3225, 3236, 3238, 3747, 3760, 5465, 6160, 6173, 6179, 6181, 12243, 12437, 13626, 13858, 14884, 15101, 16177, 16872, 17229, 17307, 17309, 17322, 17389, 17392, 17394,

**Stratum: Tree 1 (EDL)**

**Height:** average: 32.96m; range: 18.00 - 50.00m; (37 sites)

**Crown Cover:** average: 59.1%; range: 25.0 - 100.0%; (37 sites)

**Stem Count:** average: 155 stems/ha; range: 40 - 280 stems/ha; std. deviation: 60.5 stems/ha; (26 sites)

**Basal area:** average: 20.3 m<sup>2</sup>/ha; range: 12.0 - 36.0 m<sup>2</sup>/ha; std. deviation: 5.5 m<sup>2</sup>/ha; (37 sites)

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

Most frequent species (up to 6):

*Eucalyptus pilularis* (100.0, 44.5), *Eucalyptus microcorys* (37.8, 8.4), *Corymbia intermedia* (29.7, 8.4), *Syncarpia glomulifera subsp. glomulifera* (21.6, 12.5), *Eucalyptus saligna* (18.9, 9.8), *Eucalyptus racemosa subsp. racemosa* (16.2, 13.9)

Additional species:

*Corymbia trachyphloia subsp. trachyphloia* (13.5, 3.5), *Angophora woodsiana* (10.8, 6.5), *Corymbia gummiifera* (8.1, 13.3), *Eucalyptus tindaliae* (8.1, 5.7), *Eucalyptus carnea* (5.4, 16.5), *Lophostemon confertus* (5.4, 8.0), *Allocasuarina torulosa* (5.4, 5.0), *Eucalyptus resinifera* (5.4, 5.0), *Eucalyptus helidonica* (5.4, 2.0), *Amyema miquelii* (5.4, 0.0), *Eucalyptus siderophloia* (2.7, 30.0), *Eucalyptus propinqua* (2.7, 10.0), *Eucalyptus biturbinata* (2.7, 8.0), *Eucalyptus acmenoides* (2.7, 5.0), *Syncarpia verecunda* (2.7, 5.0), *Angophora subvelutina* (2.7, 0.0)

## Stratum: Tree 2

**Height:** average: 14.62m; range: 5.00 - 28.00m; (33 sites)

**Crown Cover:** average: 25.4%; range: 0.0 - 74.4%; (33 sites)

**Stem Count:** average: 423 stems/ha; range: 140 - 1,280 stems/ha; std. deviation: 280.8 stems/ha; (23 sites)

**Basal area:** average: 5.9 m<sup>2</sup>/ha; range: 1.0 - 15.0 m<sup>2</sup>/ha; std. deviation: 3.4 m<sup>2</sup>/ha; (28 sites)

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

Most frequent species (up to 6):

*Allocasuarina torulosa* (70.3, 6.2), *Eucalyptus pilularis* (48.6, 21.3), *Syncarpia glomulifera subsp. glomulifera* (35.1, 23.9), *Corymbia intermedia* (29.7, 3.8), *Lophostemon confertus* (18.9, 2.2), *Eucalyptus microcorys* (16.2, 12.9)

Additional species:

*Eucalyptus saligna* (13.5, 15.2), *Eucalyptus racemosa subsp. racemosa* (13.5, 11.0), *Syncarpia verecunda* (10.8, 5.8), *Schizomeria ovata* (5.4, 29.2), *Angophora woodsiana* (5.4, 9.5), *Alphitonia excelsa* (5.4, 7.6), *Acacia maidenii* (5.4, 3.0), *Elaeocarpus reticulatus* (5.4, 2.0), *Synoum glandulosum subsp. glandulosum* (5.4, 2.0), *Banksia integrifolia subsp. compar* (5.4, 1.5), *Glochidion ferdinandi var. ferdinandi* (5.4, 0.5), *Callicoma serratifolia* (2.7, 25.0), *Acacia melanoxylon* (2.7, 6.2), *Corymbia gummifera* (2.7, 5.0), *Leptospermum trinervium* (2.7, 5.0), *Acacia irrorata subsp. irrorata* (2.7, 3.0), *Eucalyptus siderophloia* (2.7, 2.0), *Rhodamnia rubescens* (2.7, 2.0), *Trochocarpa laurina* (2.7, 2.0), *Acronychia pubescens* (2.7, 1.0), *Cryptocarya microneura* (2.7, 1.0), *Eucalyptus biturbinata* (2.7, 1.0), *Eucalyptus resinifera* (2.7, 1.0), *Corymbia trachyphloia subsp. trachyphloia* (2.7, 0.5), *Amyema congener* (2.7, 0.0), *Cryptocarya glaucescens* (2.7, 0.0), *Cymbidium madidum* (2.7, 0.0), *Elaeocarpus eumundi* (2.7, 0.0), *Eucalyptus carnea* (2.7, 0.0), *Parsonsia straminea* (2.7, 0.0), *Platyterium bifurcatum* (2.7, 0.0), *Syzygium oleosum* (2.7, 0.0)

## Stratum: Tree 3

**Height:** average: 5.94m; range: 3.50 - 10.00m; (16 sites)

**Crown Cover:** average: 26.4%; range: 0.0 - 69.8%; (16 sites)

**Stem Count:** average: 871 stems/ha; range: 140 - 3,000 stems/ha; std. deviation: 784.0 stems/ha; (13 sites)

**Basal area:** average: 3.8 m<sup>2</sup>/ha; range: 1.0 - 11.0 m<sup>2</sup>/ha; std. deviation: 3.6 m<sup>2</sup>/ha; (8 sites)

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

Most frequent species (up to 6):

*Allocasuarina torulosa* (35.1, 13.6), *Lophostemon confertus* (21.6, 7.7), *Syncarpia glomulifera subsp. glomulifera* (18.9, 24.5), *Elaeocarpus reticulatus* (16.2, 3.8), *Eucalyptus pilularis* (16.2, 2.9), *Cryptocarya glaucescens* (13.5, 3.1)

Additional species:

*Corymbia intermedia* (10.8, 6.6), *Eucalyptus microcorys* (10.8, 4.9), *Synoum glandulosum subsp. glandulosum* (8.1, 10.4), *Schizomeria ovata* (8.1, 4.8), *Cryptocarya macdonaldii* (5.4, 9.8), *Alphitonia excelsa* (5.4, 8.4), *Syzygium oleosum* (5.4, 3.4), *Acacia maidenii* (5.4, 2.4), *Hakea eriantha* (5.4, 1.6), *Parsonsia straminea* (5.4, 0.0), *Acacia melanoxylon* (2.7, 5.6), *Callicoma serratifolia* (2.7, 5.6), *Alsophila australis* (2.7, 0.0), *Archontophoenix cunninghamiana* (2.7, 0.0), *Canarium australasicum* (2.7, 0.0), *Cinnamomum oliveri* (2.7, 0.0), *Cissus hypoglauca* (2.7, 0.0), *Dodonaea triquetra* (2.7, 0.0), *Endiandra sieberi* (2.7, 0.0), *Eucalyptus racemosa subsp. racemosa* (2.7, 0.0), *Eucalyptus saligna* (2.7, 0.0), *Hovea acutifolia* (2.7, 0.0), *Sloanea woollsii* (2.7, 0.0)

## Stratum: Shrub 1

**Height:** average: 1.82m; range: 1.00 - 3.50m; (37 sites)

**Crown Cover:** average: 22.2%; range: 0.0 - 81.0%; (37 sites)

**Stem Count:** average: 4,807 stems/ha; range: 400 - 17,500 stems/ha; std. deviation: 5,041.1 stems/ha; (23 sites)

**Basal area:** average: 1.4 m<sup>2</sup>/ha; range: 1.0 - 2.0 m<sup>2</sup>/ha; std. deviation: 0.6 m<sup>2</sup>/ha; (5 sites)

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

Most frequent species (up to 6):

*Allocasuarina torulosa* (62.2, 2.0), *Lophostemon confertus* (56.8, 2.6), *Acacia maidenii* (51.4, 1.7), *Elaeocarpus reticulatus* (48.6, 3.6),



*Breynia oblongifolia* (37.8, 0.7), *Hovea acutifolia* (35.1, 8.9)

Additional species:

*Platylobium formosum* (32.4, 6.8), *Lomatia silaifolia* (32.4, 2.8), *Syncarpia glomulifera* subsp. *glomulifera* (29.7, 3.4), *Eucalyptus pilularis* (29.7, 1.5), *Dodonaea triquetra* (27.0, 25.3), *Synoum glandulosum* subsp. *glandulosum* (27.0, 4.0), *Glochidion ferdinandi* var. *ferdinandi* (27.0, 3.5), *Cissus hypoglauca* (27.0, 1.0), *Acacia melanoxylon* (24.3, 2.0), *Acrotriche aggregata* (24.3, 1.9), *Pultenaea retusa* (21.6, 1.7), *Cryptocarya glaucescens* (18.9, 3.1), *Astrotricha latifolia* (18.9, 2.2), *Acacia myrtifolia* (18.9, 1.4), *Corymbia intermedia* (18.9, 1.4), *Hibbertia aspera* subsp. *aspera* (18.9, 0.4), *Alphitonia excelsa* (16.2, 4.7), *Acacia irrorata* subsp. *irrorata* (16.2, 4.0), *Alpinia caerulea* (16.2, 2.0), *Hakea eriantha* (16.2, 1.9), *Eupomatia laurina* (16.2, 1.0), *Xanthorrhoea latifolia* subsp. *latifolia* (13.5, 5.0), *Ptilidostigma rhytidpermum* (13.5, 4.0), *Pultenaea villosa* (13.5, 3.4), *Eucalyptus microcorys* (13.5, 2.2), *Smilax glycyphylla* (13.5, 1.0), *Pimelea linifolia* subsp. *linifolia* (13.5, 0.9), *Trochocarpa laurina* (13.5, 0.9), *Banksia integrifolia* subsp. *compar* (13.5, 0.8), *Ozothamnus diosmifolius* (10.8, 3.5), *Pultenaea flexilis* (10.8, 3.5), *Acacia penninervis* var. *penninervis* (10.8, 1.2), *Macrozamia lucida* (10.8, 1.0), *Rubus moluccanus* var. *trilobus* (10.8, 1.0), *Austromyrtus dulcis* (10.8, 0.0), *Geitonoplesium cymosum* (10.8, 0.0), *Acacia longissima* (8.1, 9.5), *Baccharis halimifolia*\* (8.1, 6.0), *Billardiera scandens* (8.1, 2.0), *Seringia arborescens* (8.1, 2.0), *Archontophoenix cunninghamiana* (8.1, 1.2), *Monotoca scoparia* (8.1, 1.2), *Cinnamomum camphora*\* (8.1, 1.0), *Podolobium ilicifolium* (8.1, 1.0), *Schizomeria ovata* (8.1, 1.0), *Trema tomentosa* var. *aspera* (8.1, 1.0), *Xanthorrhoea johnsonii* (8.1, 1.0), *Hibbertia aspera* (8.1, 0.8), *Cryptocarya macdonaldii* (8.1, 0.6), *Commersonia bartramia* (8.1, 0.0), *Eustrephus latifolius* (8.1, 0.0), *Leptospermum trinervium* (5.4, 4.5), *Banksia spinulosa* var. *collina* (5.4, 4.0), *Rubus rosifolius* (5.4, 2.0), *Persoonia iogyna* (5.4, 1.5), *Denhamia silvestris* (5.4, 1.2), *Indigofera australis* subsp. *australis* (5.4, 1.0), *Notelaea ovata* (5.4, 1.0), *Polyscias sambucifolia* (5.4, 1.0), *Psychotria loniceroides* (5.4, 1.0), *Acacia disparrima* subsp. *disparrima* (5.4, 0.8), *Hakea florulenta* (5.4, 0.5), *Dioscorea transversa* (5.4, 0.0), *Elaeocarpus obovatus* (5.4, 0.0), *Eucalyptus racemosa* subsp. *racemosa* (5.4, 0.0), *Eucalyptus saligna* (5.4, 0.0), *Exocarpos cupressiformis* (5.4, 0.0), *Hibbertia dentata* (5.4, 0.0), *Lantana camara*\* (5.4, 0.0), *Persoonia sericea* (5.4, 0.0), *Polyscias elegans* (5.4, 0.0), *Zieria minutiflora* subsp. *minutiflora* (5.4, 0.0), *Zieria smithii* (5.4, 0.0), *Acacia penninervis* var. *longiracemosa* (2.7, 30.0), *Daviesia villifera* (2.7, 7.0), *Daviesia ulicifolia* (2.7, 6.0), *Goodia lotifolia* (2.7, 5.0), *Rhodamnia rubescens* (2.7, 5.0), *Banksia oblongifolia* (2.7, 3.0), *Leucopogon pimeleoides* (2.7, 2.6), *Xanthorrhoea* (2.7, 2.4), *Daviesia wyattiana* (2.7, 2.0), *Imperata cylindrica* (2.7, 2.0), *Syncarpia verecunda* (2.7, 2.0), *Abrophyllum omans* (2.7, 1.0), *Acacia complanata* (2.7, 1.0), *Acronychia pubescens* (2.7, 1.0), *Banksia spinulosa* var. *spinulosa* (2.7, 1.0), *Cryptocarya microneura* (2.7, 1.0), *Gahnia sieberiana* (2.7, 1.0), *Hibiscus heterophyllus* (2.7, 1.0), *Leucopogon affinis* (2.7, 1.0), *Persoonia stradbrokeensis* (2.7, 1.0), *Jagera pseudorhus* var. *pseudorhus* (2.7, 0.6), *Acacia implexa* (2.7, 0.5), *Choretrum candollei* (2.7, 0.5), *Corymbia trachyphloia* subsp. *trachyphloia* (2.7, 0.5), *Eucalyptus siderophloia* (2.7, 0.5), *Eucalyptus tereticornis* (2.7, 0.5), *Gymnostachys anceps* (2.7, 0.5), *Persoonia* (2.7, 0.5), *Geranium solanderi* var. *solanderi* (2.7, 0.2), *Acacia falcata* (2.7, 0.0), *Acmena hemilampra* (2.7, 0.0), *Alsophila australis* (2.7, 0.0), *Callicoma serratifolia* (2.7, 0.0), *Canarium australasicum* (2.7, 0.0), *Cassia* (2.7, 0.0), *Cassinia* (2.7, 0.0), *Cassinia laevis* subsp. *rosmarinifolia* (2.7, 0.0), *Cissus antarctica* (2.7, 0.0), *Cissus oblonga* (2.7, 0.0), *Cordyline rubra* (2.7, 0.0), *Corymbia gummifera* (2.7, 0.0), *Desmodium gunnii* (2.7, 0.0), *Duboisia myoporoides* (2.7, 0.0), *Elaeocarpus eumundi* (2.7, 0.0), *Endiandra discolor* (2.7, 0.0), *Endiandra sieberi* (2.7, 0.0), *Euroschinus falcatus* (2.7, 0.0), *Glochidion sumatranum* (2.7, 0.0), *Guioa semiglaucula* (2.7, 0.0), *Litsea leefeana* (2.7, 0.0), *Lordhowea amygdalifolia* (2.7, 0.0), *Melodinus australis* (2.7, 0.0), *Myrsine variabilis* (2.7, 0.0), *Neolitsea dealbata* (2.7, 0.0), *Pandorea pandorana* (2.7, 0.0), *Persoonia virgata* (2.7, 0.0), *Petrophile canescens* (2.7, 0.0), *Pinus elliotii*\* (2.7, 0.0), *Pittosporum revolutum* (2.7, 0.0), *Psychotria daphnoides* (2.7, 0.0), *Pultenaea petiolaris* (2.7, 0.0), *Sambucus australasica* (2.7, 0.0), *Smilax australis* (2.7, 0.0), *Styphelia biflora* (2.7, 0.0), *Wikstroemia indica* (2.7, 0.0)

## Stratum: Shrub 2

**Height:** average: 1.47m; range: 1.20 - 2.00m; (3 sites)

**Crown Cover:** average: 22.0%; range: 8.0 - 48.0%; (3 sites)

**Stem Count:** average: 760 stems/ha; range: 760 - 760 stems/ha; std. deviation: 0.0 stems/ha; (1 site)

**Basal area:** No data available.

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

Most frequent species (up to 6):

*Hovea acutifolia* (5.4, 7.5), *Lophostemon confertus* (5.4, 5.0), *Platylobium formosum* (5.4, 2.5), *Podolobium ilicifolium* (5.4, 2.0), *Daviesia villifera* (2.7, 20.0), *Austromyrtus dulcis* (2.7, 7.0)

Additional species:

*Xanthorrhoea latifolia* subsp. *latifolia* (2.7, 5.0), *Banksia spinulosa* var. *collina* (2.7, 3.0), *Acrotriche aggregata* (2.7, 1.0), *Bursaria spinosa* subsp. *spinosa* (2.7, 1.0), *Acacia longissima* (2.7, 0.0), *Acacia maidenii* (2.7, 0.0), *Astrotricha latifolia* (2.7, 0.0), *Hakea florulenta* (2.7, 0.0), *Litsea leefeana* (2.7, 0.0)

## Stratum: Ground

Height: average: 0.62m; range: 0.30 - 1.50m; (36 sites)

Projective foliage cover (PFC): average: 40.6%; range: 0.0 - 81.0%; (36 sites)

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

### Grass - perennial:

Most frequent species (up to 6):

*Imperata cylindrica* (80.6, 9.8), *Entolasia stricta* (61.1, 2.3), *Themeda triandra* (52.8, 12.6), *Digitaria parviflora* (47.2, 1.5), *Oplismenus aemulus* (33.3, 1.2), *Panicum effusum* (25.0, 0.9)

Additional species:

*Ottochloa gracillima* (16.7, 1.8), *Ottochloa nodosa* (16.7, 17.6), *Poa labillardierei* var. *labillardierei* (16.7, 4.8), *Cymbopogon refractus* (13.9, 2.0), *Dichelachne micrantha* (11.1, 4.3), *Aristida calycina* var. *calycina* (8.3, 0.8), *Echinopogon ovatus* (5.6, 1.0), *Entolasia marginata* (5.6, 2.0), *Oplismenus imbecillis* (5.6, 0.0), *Sporobolus laxus* (5.6, 0.0), *Alloteropsis semialata* (2.8, 0.0), *Capillipedium spicigerum* (2.8, 0.0), *Echinopogon caespitosus* var. *caespitosus* (2.8, 8.0), *Eragrostis* (2.8, 0.0), *Eremochloa bimaculata* (2.8, 0.5), *Microlaena stipoides* (2.8, 0.0), *Paspalidium distans* (2.8, 0.0), *Paspalum scrobiculatum* (2.8, 0.0), *Poa* (2.8, 1.0), *Poa sieberiana* (2.8, 0.0), *Poaceae* (2.8, 0.0), *Sporobolus* (2.8, 1.0), *Sporobolus creber* (2.8, 0.0)

### Grass - annual/biennial:

Not present

### Forbs & other:

Most frequent species (up to 6):

*Pteridium esculentum* (91.7, 6.6), *Lomandra longifolia* (72.2, 0.4), *Goodenia rotundifolia* (58.3, 1.1), *Desmodium rhytidophyllum* (55.6, 1.1), *Blechnum cartilagineum* (50.0, 2.8), *Calochlaena dubia* (50.0, 19.0)

Additional species:

*Dianella caerulea* (50.0, 0.8), *Eustrephus latifolius* (50.0, 0.8), *Glycine clandestina* var. *clandestina* (47.2, 0.6), *Cissus hypoglauca* (44.4, 1.5), *Lepidosperma laterale* var. *laterale*\* (44.4, 1.0), *Billardiera scandens* (41.7, 0.7), *Smilax glycyphylla* (41.7, 0.7), *Cyanthillium cinereum* (36.1, 1.0), *Hardenbergia violacea* (36.1, 0.7), *Kennedia rubicunda* (36.1, 1.0), *Platylobium formosum* (36.1, 3.0), *Desmodium gunnii* (33.3, 0.3), *Breyenia oblongifolia* (30.6, 0.6), *Hibbertia aspera* (30.6, 1.6), *Lobelia purpurascens* (30.6, 0.6), *Pimelea linifolia* subsp. *linifolia* (30.6, 0.6), *Acacia maidenii* (27.8, 0.2), *Hibbertia dentata* (27.8, 1.8), *Viola hederacea* (27.8, 0.2), *Hibbertia aspera* subsp. *aspera* (25.0, 1.6), *Rubus moluccanus* var. *trilobus* (25.0, 1.0), *Archontophoenix cunninghamiana* (22.2, 0.0), *Geitonoplesium cymosum* (22.2, 0.0), *Lomandra multiflora* subsp. *multiflora* (22.2, 0.7), *Pultenaea retusa* (22.2, 0.9), *Rubus parvifolius* (22.2, 1.3), *Oxalis chnoodes* (19.4, 0.0), *Zieria minutiflora* subsp. *minutiflora* (19.4, 0.6), *Acrotriche aggregata* (16.7, 3.0), *Elaeocarpus reticulatus* (16.7, 0.6), *Geranium solanderi* var. *solanderi* (16.7, 2.1), *Lomandra hystrix* (16.7, 0.2), *Pigea stellarioides* (16.7, 0.3), *Viola betonicifolia* (16.7, 0.0), *Acacia myrtifolia* (13.9, 0.0), *Allocasuarina torulosa* (13.9, 0.6), *Alphitonia excelsa* (13.9, 0.0), *Astrotricha latifolia* (13.9, 0.0), *Austromyrtus dulcis* (13.9, 1.1), *Cassytha filiformis* (13.9, 0.4), *Dioscorea transversa* (13.9, 0.2), *Gahnia aspera* (13.9, 0.4), *Gonocarpus humilis* (13.9, 0.2), *Gymnostachys anceps* (13.9, 0.0), *Hydrocotyle laxiflora* (13.9, 0.0), *Lindsaea microphylla* (13.9, 3.0), *Smilax australis* (13.9, 1.2), *Tetradlea thymifolia* (13.9, 2.2), *Xanthorrhoea latifolia* subsp. *latifolia* (13.9, 2.0), *Coleus australis* (11.1, 0.0), *Comesperma hispidulum* (11.1, 1.0), *Corymbia intermedia* (11.1, 0.3), *Cryptocarya glaucescens* (11.1, 0.6), *Dodonaea triquetra* (11.1, 3.0), *Eupomatia laurina* (11.1, 0.0), *Hovea acutifolia* (11.1, 0.3), *Patersonia glabrata* (11.1, 0.0), *Senecio distallobatus* (11.1, 0.4), *Teucrium argutum* (11.1, 0.4), *Trachymene procumbens* (11.1, 0.2), *Brunoniella australis* (8.3, 0.0), *Cissus antarctica* (8.3, 0.0), *Dianella caerulea* var. *vannata* (8.3, 0.0), *Gomphocarpus fruticosus*\* (8.3, 0.5), *Hakea eriantha* (8.3, 1.0), *Hypochaeris radicata*\* (8.3, 0.6), *Indigofera australis* subsp. *australis* (8.3, 0.7), *Lomatia silaifolia* (8.3, 3.3), *Lophostemon confertus* (8.3, 0.0), *Nephrolepis cordifolia* (8.3, 0.0), *Poranthera microphylla* (8.3, 0.2), *Rubus rosifolius* (8.3, 1.4), *Schizomeria ovata* (8.3, 0.2), *Wikstroemia indica* (8.3, 0.5), *Xanthorrhoea johnsonii* (8.3, 10.0), *Zieria smithii* (8.3, 0.0), *Acacia disparima* subsp. *disparima* (5.6, 0.0), *Baccharis halimifolia*\* (5.6, 0.0), *Cassinia* (5.6, 0.0), *Centella asiatica* (5.6, 0.2), *Chrysocephalum apiculatum* (5.6, 0.0), *Cinnamomum camphora*\* (5.6, 0.0), *Cirsium vulgare*\* (5.6, 0.5), *Clerodendrum floribundum* (5.6, 0.0), *Commersonia bartramia* (5.6, 0.0), *Conyza*\* (5.6, 0.0), *Cryptocarya macdonaldii* (5.6, 0.6), *Dampiera sylvestris* (5.6, 0.2), *Dianella* (5.6, 1.0), *Dipodium variegatum* (5.6, 0.0), *Endiandra sieberi* (5.6, 0.2), *Eucalyptus pilularis* (5.6, 0.0), *Euchiton involucratus* (5.6, 0.2), *Gleichenia dicarpa* (5.6, 12.5), *Glochidion ferdinandi* var. *ferdinandi* (5.6, 0.0), *Gompholobium pinnatum* (5.6, 0.0), *Haloragis heterophylla* (5.6, 0.0), *Hibbertia linearis* var. *obtusifolia* (5.6, 0.0), *Hibbertia scandens* (5.6, 0.0), *Hypericum gramineum* (5.6, 0.0), *Lantana camara*\* (5.6, 0.0), *Lobelia gibbosa* (5.6, 0.0), *Macrozamia lucida* (5.6, 0.0), *Melichrus adpressus* (5.6, 0.0), *Mentha satureioides* (5.6, 0.0), *Monotoca scoparia* (5.6, 1.0), *Neolitsea dealbata* (5.6, 0.0), *Notelaea longifolia* (5.6, 0.0), *Ozothamnus diosmifolius* (5.6, 0.0), *Parsonia straminea* (5.6, 0.0), *Personia sericea* (5.6, 0.5), *Pomax umbellata* (5.6, 0.0), *Pseuderanthemum variabile* (5.6, 0.3), *Pultenaea petiolaris* (5.6, 0.0), *Schizaea bifida* (5.6, 0.0), *Schoenus melanostachys* (5.6, 9.7), *Sigesbeckia orientalis* (5.6, 0.4), *Stephania japonica* var. *discolor* (5.6, 0.0), *Sticherus lobatus* (5.6, 7.6), *Stylidium graminifolium* (5.6, 0.0), *Styphelia sieberi* (5.6, 0.0), *Syncarpia glomulifera* subsp. *glomulifera* (5.6, 0.0), *Synoum glandulosum* subsp. *glandulosum* (5.6, 0.0), *Syzygium oleosum* (5.6, 0.0), *Tetrastigma nitens* (5.6, 0.0), *Trochocarpa laurina* (5.6, 0.0), *Xanthosia pilosa* (5.6, 1.0), *Abrophyllum ornans* (2.8, 0.0), *Acacia melanoxylon* (2.8, 0.0), *Acmena smithii* (2.8, 0.0), *Acronychia laevis* (2.8, 0.0), *Adiantum* (2.8, 0.0), *Alphitonia petriei* (2.8, 0.0), *Alpinia caerulea* (2.8, 0.0), *Araujia sericifera*\* (2.8, 0.0), *Astrotricha umbrosa* (2.8, 0.0), *Blechnum rupestre* (2.8, 0.0), *Bossiaea heterophylla* (2.8, 0.0), *Callicoma serratifolia* (2.8, 0.0), *Carex* (2.8, 0.0), *Carex breviculmis* (2.8, 0.0), *Cassytha pubescens* (2.8, 0.5), *Caustis flexuosa* (2.8, 5.0), *Celastrus subspicata* (2.8, 0.0), *Centratherum punctatum*\* (2.8, 0.0), *Chamaecrista nomame* var. *nomame* (2.8, 0.0), *Clematis*



*glycinoides* (2.8, 1.0), *Comesperma volubile* (2.8, 0.0), *Cordyline rubra* (2.8, 0.0), *Coronidium elatum* subsp. *elatum* (2.8, 0.0), *Crassocephalum crepidioides*\* (2.8, 0.2), *Crassula sieberiana* (2.8, 0.0), *Crotalaria montana* (2.8, 4.0), *Cryptocarya microneura* (2.8, 0.0), *Cryptostylis erecta* (2.8, 0.0), *Cryptostylis subulata* (2.8, 0.0), *Cyanothamnus polygalifolius* (2.8, 0.0), *Cymbidium madidum* (2.8, 0.0), *Cyperus esculentus*\* (2.8, 0.0), *Cyperus gracilis* (2.8, 0.0), *Dendrobium kingianum* subsp. *kingianum* (2.8, 0.0), *Denhamia celastroides* (2.8, 0.0), *Denhamia silvestris* (2.8, 0.0), *Desmodium brachypodum* (2.8, 0.0), *Desmodium varians* (2.8, 0.0), *Dianella brevipedunculata* (2.8, 0.0), *Dianella longifolia* (2.8, 0.0), *Dianella rara* (2.8, 0.5), *Dianella revoluta* (2.8, 0.0), *Dichondra repens* (2.8, 0.0), *Dicranopteris linearis* var. *linearis* (2.8, 0.0), *Endiandra discolor* (2.8, 0.0), *Erigeron primulifolius*\* (2.8, 0.0), *Eucalyptus microcorys* (2.8, 0.0), *Eucalyptus saligna* (2.8, 0.2), *Eupomatia bennettii* (2.8, 0.0), *Fimbristylis dichotoma* (2.8, 0.0), *Gahnia melanocarpa* (2.8, 0.0), *Gahnia sieberiana* (2.8, 1.0), *Galium leptogonium* (2.8, 0.0), *Geodorum densiflorum* (2.8, 0.0), *Gomphocarpus physocarpus*\* (2.8, 0.0), *Gomphrena celosioides*\* (2.8, 0.0), *Gonocarpus* (2.8, 0.0), *Gonocarpus tetragynus* (2.8, 0.0), *Gonocarpus teucroides* (2.8, 0.0), *Goodenia grandiflora* (2.8, 0.0), *Grewia latifolia* (2.8, 1.0), *Guioa acutifolia* (2.8, 0.0), *Hibbertia diffusa* (2.8, 0.2), *Hibbertia sericea* (2.8, 0.0), *Hibbertia vestita* (2.8, 1.0), *Hypoxis pratensis* (2.8, 0.0), *Juncus continuus* (2.8, 0.0), *Lagenophora sublyrata* (2.8, 0.0), *Lespedeza juncea* subsp. *sericea* (2.8, 0.0), *Lomandra* (2.8, 0.0), *Lomandra filiformis* (2.8, 0.0), *Marsdenia* (2.8, 0.2), *Murdannia graminea* (2.8, 0.0), *Myrsine variabilis* (2.8, 0.0), *Notelaea ovata* (2.8, 3.0), *Opercularia hispida* (2.8, 0.0), *Persoonia stradbrokeensis* (2.8, 0.0), *Persoonia tenuifolia* (2.8, 0.0), *Petrophile canescens* (2.8, 0.0), *Pigea enneasperma* (2.8, 0.0), *Pimelea altior* (2.8, 1.0), *Pittosporum* (2.8, 0.0), *Psychotria daphnoides* (2.8, 0.0), *Psychotria loniceroides* (2.8, 0.0), *Pterostylis* (2.8, 0.0), *Pterostylis nutans* (2.8, 0.0), *Rostellularia adscendens* (2.8, 0.0), *Sarcopetalum harveyanum* (2.8, 0.0), *Senecio pinnatifolius* (2.8, 0.0), *Sticherus flabellatus* var. *flabellatus* (2.8, 3.0), *Telmatoblechnum indicum* (2.8, 0.0), *Thysanotus tuberosus* (2.8, 0.5), *Tristaniopsis laurina* (2.8, 0.0), *Verbena bonariensis*\* (2.8, 0.0), *Verbena rigida*\* (2.8, 0.0), *Veronica plebeia* (2.8, 0.0), *Viola silicestris* (2.8, 0.2), *Wahlenbergia gracilis* (2.8, 0.0), *Woollsia pungens* (2.8, 0.2), *Youngia japonica* (2.8, 0.4), *Zornia dyctiocarpa* (2.8, 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.

**12.12.2b: Eucalyptus pilularis tall open forest with a distinct understorey dominated by rainforest species on Mesozoic to Proterozoic igneous rocks**



<b>Mapping data</b>	No data available.
<b>Species richness</b>	total: 96 (8 sites); woody: 75 (8 sites); ground: 67 (8 sites); average spp./site: 42.4, standard deviation: 9.0 (8 sites)
<b>Basal area</b>	average/site: 30.9 m <sup>2</sup> /ha; range: 19.0 - 46.0 m <sup>2</sup> /ha; std. deviation: 10.2; (8 sites)
<b>Ecological dominant layer (EDL) height</b>	stratum: tree 1; average/site: 37.62m; range: 31.00 - 48.00m; (8 sites)
<b>Ecological dominant layer (EDL) Crown Cover</b>	stratum: tree 1; average: 85.6%; range: 63.6 - 114.1%; (8 sites)
<b>Structural formation</b>	Tall Open Forest: 100.0 %; (8 sites)
<b>Representative site(s)</b>	15543, 16867, 17214, 17326, 17327, 17395, 17683, 17903

**Stratum: Tree 1 (EDL)**

**Height:** average: 37.62m; range: 31.00 - 48.00m; (8 sites)

**Crown Cover:** average: 85.6%; range: 63.6 - 114.1%; (8 sites)

**Stem Count:** average: 160 stems/ha; range: 80 - 240 stems/ha; std. deviation: 57.6 stems/ha; (8 sites)

**Basal area:** average: 18.4 m<sup>2</sup>/ha; range: 10.0 - 27.0 m<sup>2</sup>/ha; std. deviation: 6.0 m<sup>2</sup>/ha; (8 sites)

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

Most frequent species (up to 6):

*Eucalyptus pilularis* (100.0, 69.7), *Eucalyptus microcorys* (37.5, 23.3), *Syncarpia glomulifera subsp. glomulifera* (37.5, 16.9), *Corymbia intermedia* (37.5, 12.1), *Acacia melanoxydon* (12.5, 0.0), *Eucalyptus acmenoides* (12.5, 0.0)

Additional species:

*Litsea leefeana* (12.5, 0.0), *Lophostemon confertus* (12.5, 0.0)

## Stratum: Tree 2

**Height:** average: 20.62m; range: 16.00 - 24.00m; (8 sites)

**Crown Cover:** average: 59.9%; range: 15.8 - 83.2%; (8 sites)

**Stem Count:** average: 322 stems/ha; range: 140 - 560 stems/ha; std. deviation: 155.1 stems/ha; (8 sites)

**Basal area:** average: 10.6 m<sup>2</sup>/ha; range: 2.0 - 17.0 m<sup>2</sup>/ha; std. deviation: 5.0 m<sup>2</sup>/ha; (8 sites)

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

Most frequent species (up to 6):

*Syncarpia glomulifera* subsp. *glomulifera* (87.5, 42.8), *Allocasuarina torulosa* (62.5, 14.2), *Synoum glandulosum* subsp. *glandulosum* (50.0, 6.4), *Eucalyptus microcorys* (37.5, 22.5), *Lophostemon confertus* (37.5, 10.9), *Cryptocarya glaucescens* (37.5, 0.0)

Additional species:

*Cymbidium canaliculatum* (25.0, 0.0), *Endiandra discolor* (25.0, 0.0), *Canarium australasicum* (12.5, 9.2), *Corymbia intermedia* (12.5, 3.8), *Elaeocarpus eumundi* (12.5, 2.8), *Acacia melanoxylon* (12.5, 1.0), *Acacia maidenii* (12.5, 0.0), *Alphitonia excelsa* (12.5, 0.0), *Eucalyptus pilularis* (12.5, 0.0), *Litsea leefeana* (12.5, 0.0), *Parsonsia straminea* (12.5, 0.0)

## Stratum: Tree 3

**Height:** average: 6.59m; range: 5.00 - 10.00m; (7 sites)

**Crown Cover:** average: 56.3%; range: 35.2 - 93.8%; (7 sites)

**Stem Count:** average: 1,386 stems/ha; range: 1,040 - 1,720 stems/ha; std. deviation: 266.0 stems/ha; (7 sites)

**Basal area:** average: 4.7 m<sup>2</sup>/ha; range: 2.0 - 7.0 m<sup>2</sup>/ha; std. deviation: 2.5 m<sup>2</sup>/ha; (3 sites)

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

Most frequent species (up to 6):

*Allocasuarina torulosa* (87.5, 2.0), *Elaeocarpus reticulatus* (75.0, 9.9), *Synoum glandulosum* subsp. *glandulosum* (75.0, 5.3), *Syncarpia*

*glomulifera* subsp. *glomulifera* (62.5, 28.2), *Cryptocarya glaucescens* (62.5, 14.1), *Endiandra discolor* (50.0, 5.9)

Additional species:

*Litsea leefeana* (50.0, 5.7), *Lophostemon confertus* (50.0, 1.8), *Endiandra sieberi* (37.5, 20.9), *Elaeocarpus eumundi* (37.5, 7.0), *Acacia maidenii* (37.5, 4.2), *Schizomeria ovata* (37.5, 4.2), *Polyscias elegans* (37.5, 1.6), *Acronychia pubescens* (37.5, 0.6), *Syzygium oleosum* (25.0, 8.4), *Alphitonia excelsa* (25.0, 6.8), *Callicoma serratifolia* (25.0, 6.6), *Acacia melanoxylon* (25.0, 6.5), *Abrophyllum ornans* (25.0, 0.0), *Canarium australasicum* (25.0, 0.0), *Cissus hypoglauca* (25.0, 0.0), *Guioa acutifolia* (25.0, 0.0), *Pittosporum revolutum* (25.0, 0.0), *Sarcopteryx stipata* (25.0, 0.0), *Pilidiostigma rhytispermum* (12.5, 7.0), *Trochocarpa laurina* (12.5, 5.6), *Euroschinus falcatus* var. *falcatus* (12.5, 2.0), *Monotoca scoparia* (12.5, 1.0), *Pittosporum undulatum* (12.5, 1.0), *Archontophoenix cunninghamiana* (12.5, 0.0), *Beilschmiedia obtusifolia* (12.5, 0.0), *Cryptocarya macdonaldii* (12.5, 0.0), *Eucalyptus microcorys* (12.5, 0.0), *Eucalyptus pilularis* (12.5, 0.0), *Flagellaria indica* (12.5, 0.0), *Flindersia schottiana* (12.5, 0.0), *Glochidion ferdinandi* var. *ferdinandi* (12.5, 0.0), *Jagera pseudorhus* var. *pseudorhus* (12.5, 0.0), *Neolitsea dealbata* (12.5, 0.0), *Parsonsia eucalyptophylla* (12.5, 0.0), *Parsonsia straminea* (12.5, 0.0), *Platylobium formosum* (12.5, 0.0)

## Stratum: Shrub 1

**Height:** average: 1.96m; range: 1.50 - 5.00m; (8 sites)

**Crown Cover:** average: 22.8%; range: 11.2 - 42.2%; (8 sites)

**Stem Count:** average: 2,818 stems/ha; range: 800 - 5,360 stems/ha; std. deviation: 1,473.9 stems/ha; (8 sites)

**Basal area:** average: 1.0 m<sup>2</sup>/ha; range: 1.0 - 1.0 m<sup>2</sup>/ha; std. deviation: 0.0 m<sup>2</sup>/ha; (1 site)

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



Most frequent species (up to 6):

*Elaeocarpus reticulatus* (100.0, 7.8), *Endiandra discolor* (87.5, 4.7), *Synoum glandulosum* subsp. *glandulosum* (87.5, 1.0), *Cryptocarya*

*glaucescens* (75.0, 6.7), *Archontophoenix cunninghamiana* (75.0, 3.6), *Lophostemon confertus* (75.0, 0.0)

Additional species:

*Cissus hypoglauca* (62.5, 2.0), *Pilidiostigma rhytispermum* (62.5, 1.4), *Alphitonia excelsa* (50.0, 3.0), *Platylobium formosum* (50.0, 2.0), *Lantana camara*\* (50.0, 1.2), *Cordyline rubra* (50.0, 1.0), *Smilax glycyphylla* (50.0, 0.9), *Acacia maidenii* (50.0, 0.0), *Euroschinus falcatus* var. *falcatus* (50.0, 0.0), *Pittosporum revolutum* (50.0, 0.0), *Endiandra sieberi* (37.5, 9.1), *Syncarpia glomulifera* subsp. *glomulifera* (37.5, 2.8), *Alpinia caerulea* (37.5, 2.0), *Dodonaea triquetra* (37.5, 2.0), *Glochidion ferdinandi* var. *ferdinandi* (37.5, 1.1), *Billardiera scandens* (37.5, 1.0), *Livistona australis* (37.5, 1.0), *Geitonoplesium cymosum* (37.5, 0.4), *Austromyrtus dulcis* (37.5, 0.0), *Canarium australasicum* (37.5, 0.0), *Elaeocarpus eumundi* (37.5, 0.0), *Guioa acutifolia* (37.5, 0.0), *Polyscias elegans* (25.0, 5.0), *Acacia penninervis* var. *longiracemosa* (25.0, 1.5), *Allocasuarina torulosa* (25.0, 1.3), *Breynia oblongifolia* (25.0, 1.0), *Dioscorea transversa* (25.0, 1.0), *Gynochthodes jasminoides* (25.0, 1.0), *Psychotria loniceroides* (25.0, 0.6), *Xanthorrhoea johnsonii* (25.0, 0.6), *Acronychia pubescens* (25.0, 0.0), *Flagellaria indica* (25.0, 0.0), *Litsea leefeana* (25.0, 0.0), *Neolitsea dealbata* (25.0, 0.0), *Pittosporum undulatum* (25.0, 0.0), *Sloanea woollsii* (25.0, 0.0), *Syzygium oleosum* (25.0, 0.0), *Trochocarpa laurina* (25.0, 0.0), *Acacia melanoxylon* (12.5, 6.0), *Callicoma serratifolia* (12.5, 0.6), *Jagera pseudorhus* var. *pseudorhus* (12.5, 0.2), *Abrophyllum omans* (12.5, 0.0), *Acrotriche aggregata* (12.5, 0.0), *Beilschmiedia obtusifolia* (12.5, 0.0), *Cinnamomum oliveri* (12.5, 0.0), *Clerodendrum floribundum* (12.5, 0.0), *Eucalyptus microcorys* (12.5, 0.0), *Eupomatia laurina* (12.5, 0.0), *Exocarpos latifolius* (12.5, 0.0), *Hibbertia aspera* subsp. *aspera* (12.5, 0.0), *Hibbertia scandens* (12.5, 0.0), *Lomatia silaifolia* (12.5, 0.0), *Melodorum leichhardtii* (12.5, 0.0), *Mischarytera lautereriana* (12.5, 0.0), *Palmeria racemosa* (12.5, 0.0), *Rubus moluccanus* var. *trilobus* (12.5, 0.0), *Sarcopteryx stipata* (12.5, 0.0), *Schizomeria ovata* (12.5, 0.0), *Stephania japonica* var. *discolor* (12.5, 0.0), *Tetrastigma nitens* (12.5, 0.0)

## **Stratum: Ground**

**Height:** average: 0.80m; range: 0.60 - 1.10m; (8 sites)

**Projective foliage cover (PFC):** average: 32.7%; range: 7.8 - 63.0%; (8 sites)

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

#### **Grass - perennial:**

Most frequent species (up to 6):

*Digitaria parviflora* (87.5, 13.3), *Ottochloa gracillima* (50.0, 0.9), *Entolasia stricta* (25.0, 1.0), *Ottochloa nodosa* (12.5, 1.0),

Additional species:

#### **Grass - annual/biennial:**

Not present

#### **Forbs & other:**

Most frequent species (up to 6):

*Archontophoenix cunninghamiana* (87.5, 0.2), *Geitonoplesium cymosum* (87.5, 0.8), *Smilax glycyphylla* (87.5, 1.4), *Dianella caerulea* (75.0, 0.2), *Pteridium esculentum* (75.0, 6.3), *Austromyrtus dulcis* (62.5, 1.0)

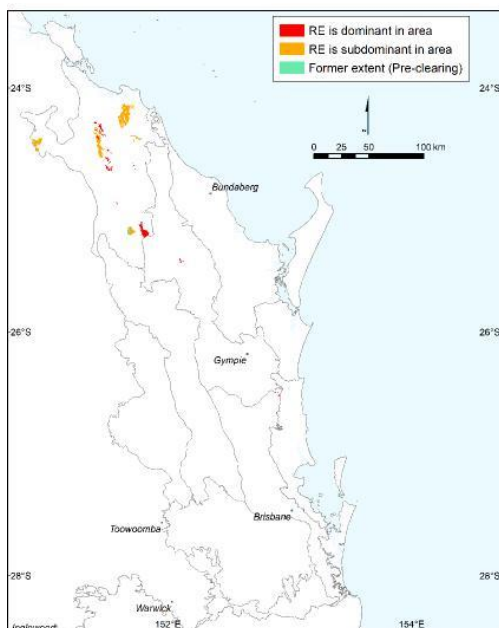
Additional species:

*Dioscorea transversa* (62.5, 0.4), *Elaeocarpus reticulatus* (62.5, 1.1), *Alpinia caerulea* (50.0, 0.0), *Billardiera scandens* (50.0, 0.2), *Calochlaena dubia* (50.0, 17.1), *Platylobium formosum* (50.0, 0.2), *Blechnum cartilagineum* (37.5, 1.8), *Breynia oblongifolia* (37.5, 0.0), *Cordyline rubra* (37.5, 0.0), *Cryptocarya glaucescens* (37.5, 2.4), *Endiandra discolor* (37.5, 0.4), *Hibbertia scandens* (37.5, 1.1), *Lepidosperma laterale* (37.5, 0.0), *Lomandra longifolia* (37.5, 1.0), *Rubus moluccanus* var. *trilobus* (37.5, 0.0), *Syncarpia glomulifera* subsp. *glomulifera* (37.5, 0.0), *Alphitonia excelsa* (25.0, 0.4), *Blechnum rupestre* (25.0, 1.1), *Cissus hypoglauca* (25.0, 0.0), *Cymbidium canaliculatum* (25.0, 0.0), *Eucalyptus pilularis* (25.0, 0.2), *Eupomatia laurina* (25.0, 0.0), *Eustrephus latifolius* (25.0, 0.2), *Flagellaria indica* (25.0, 0.0), *Gahnia aspera* (25.0, 0.0), *Gleichenia dicarpa* (25.0, 44.9), *Gynochthodes jasminoides* (25.0, 0.0), *Livistona australis* (25.0, 0.6), *Lophostemon confertus* (25.0, 0.0), *Neolitsea dealbata* (25.0, 0.0), *Patersonia glabrata* (25.0, 0.7), *Pilidiostigma rhytispermum* (25.0, 0.0), *Sloanea woollsii* (25.0, 0.0), *Synoum glandulosum* subsp. *glandulosum* (25.0, 0.6), *Tetrastigma nitens* (25.0, 0.0), *Acacia penninervis* var. *longiracemosa* (12.5, 0.0), *Acronychia pubescens* (12.5, 0.0), *Allocasuarina torulosa* (12.5, 0.0), *Callicoma serratifolia* (12.5, 0.0), *Canarium australasicum* (12.5, 0.0), *Cassytha filiformis* (12.5, 0.2),

*Corymbia intermedia* (12.5, 0.0), *Dodonaea triquetra* (12.5, 0.0), *Geodorum densiflorum* (12.5, 0.4), *Guioa acutifolia* (12.5, 0.2), *Gymnostachys anceps* (12.5, 0.0), *Hibbertia aspera subsp. aspera* (12.5, 0.0), *Lantana camara\** (12.5, 1.0), *Leichhardtia coronata* (12.5, 0.4), *Lomandra laxa* (12.5, 0.6), *Lomatia silaifolia* (12.5, 1.0), *Mischarytera lautereriana* (12.5, 0.0), *Pittosporum revolutum* (12.5, 0.0), *Polyscias elegans* (12.5, 0.0), *Psilotum nudum* (12.5, 0.0), *Syzygium oleosum* (12.5, 0.0), *Xanthorrhoea johnsonii* (12.5, 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.

12.12.4: *Eucalyptus acmenoides* +/- *Syncarpia glomulifera* woodland on Mesozoic to Proterozoic igneous rocks, especially granite



<b>Mapping data</b>	<b>Pre-clearing area = 11,189.1 ha; Remnant area 2019 = 10,516.1 ha; Remnant percent remaining in 2019 = 94.0 %</b>
<b>Species richness</b>	total: 344 (31 sites); woody: 107 (30 sites); ground: 269 (18 sites); average spp./site: 53.1, standard deviation: 15.1 (18 sites)
<b>Basal area</b>	average/site: 23.6 m <sup>2</sup> /ha; range: 12.0 - 40.0 m <sup>2</sup> /ha; std. deviation: 7.8; (31 sites)
<b>Ecological dominant layer (EDL) height</b>	stratum: tree 1; average/site: 20.55m; range: 15.00 - 26.00m; (31 sites)
<b>Ecological dominant layer (EDL) Crown Cover</b>	stratum: tree 1; average: 43.6%; range: 13.0 - 94.6%; (31 sites)
<b>Structural formation</b>	Woodland: 58.1 %; Open Forest: 38.7 %; Open Woodland: 3.2 %; (31 sites)
<b>Representative site(s)</b>	1856, 1891, 1926, 2290, 2291, 2305, 2475, 2717, 2721, 2722, 2792, 2824, 2939, 2941, 3151, 3346, 3347, 3362, 3369, 3411, 3426, 3880, 11895, 14772, 15728, 16897, 17310, 17397, 17864, 18395, 18396

**Stratum: Tree 1 (EDL)**

**Height:** average: 20.55m; range: 15.00 - 26.00m; (31 sites)

**Crown Cover:** average: 43.6%; range: 13.0 - 94.6%; (31 sites)

**Stem Count:** average: 212 stems/ha; range: 70 - 420 stems/ha; std. deviation: 99.5 stems/ha; (11 sites)

**Basal area:** average: 20.5 m<sup>2</sup>/ha; range: 8.0 - 38.0 m<sup>2</sup>/ha; std. deviation: 7.7 m<sup>2</sup>/ha; (31 sites)

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

Most frequent species (up to 6):

*Eucalyptus acmenoides* (96.8, 19.9), *Corymbia intermedia* (74.2, 11.8), *Syncarpia glomulifera* subsp. *glomulifera* (51.6, 9.6), *Corymbia*

*trachyphloia* subsp. *trachyphloia* (32.3, 18.5), *Lophostemon confertus* (19.4, 18.9), *Eucalyptus crebra* (16.1, 10.0)

Additional species:



*Eucalyptus tereticornis* (12.9, 0.7), *Eucalyptus major* (9.7, 2.5), *Allocasuarina torulosa* (9.7, 0.0), *Eucalyptus pilularis* (6.5, 5.8), *Angophora floribunda* (6.5, 3.0), *Eucalyptus melliodora* (6.5, 3.0), *Eucalyptus montivaga* (6.5, 1.0), *Corymbia citriodora subsp. variegata* (6.5, 0.6), *Eucalyptus microcorys* (6.5, 0.0), *Eucalyptus resinifera* (3.2, 16.0), *Eucalyptus longirostrata* (3.2, 6.0), *Dysphania glomulifera subsp. glomulifera* (3.2, 5.0), *Eucalyptus exserta* (3.2, 5.0), *Lophostemon suaveolens* (3.2, 5.0), *Eucalyptus decolor* (3.2, 1.0), *Eucalyptus suffulgens* (3.2, 0.0)

### **Stratum: Tree 2**

**Height:** average: 11.43m; range: 8.00 - 17.00m; (21 sites)

**Crown Cover:** average: 10.8%; range: 0.0 - 36.4%; (21 sites)

**Stem Count:** average: 170 stems/ha; range: 20 - 360 stems/ha; std. deviation: 97.2 stems/ha; (10 sites)

**Basal area:** average: 3.2 m<sup>2</sup>/ha; range: 1.0 - 9.0 m<sup>2</sup>/ha; std. deviation: 2.2 m<sup>2</sup>/ha; (16 sites)

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

Most frequent species (up to 6):

*Eucalyptus acmenoides* (38.7, 7.6), *Allocasuarina torulosa* (32.3, 5.2), *Corymbia intermedia* (22.6, 6.0), *Lophostemon confertus* (19.4,

7.7), *Allocasuarina littoralis* (12.9, 10.8), *Syncarpia glomulifera subsp. glomulifera* (12.9, 3.9)

Additional species:

*Acacia disparrima subsp. disparrima* (6.5, 0.0), *Corymbia trachyphloia subsp. trachyphloia* (6.5, 0.0), *Banksia integrifolia subsp. compar* (3.2, 3.0), *Lophostemon suaveolens* (3.2, 0.6), *Cymbidium canaliculatum* (3.2, 0.0)

### **Stratum: Tree 3**

**Height:** average: 5.42m; range: 4.50 - 9.00m; (6 sites)

**Crown Cover:** average: 14.9%; range: 0.0 - 30.8%; (6 sites)

**Stem Count:** average: 1,520 stems/ha; range: 760 - 3,600 stems/ha; std. deviation: 1,389.9 stems/ha; (4 sites)

**Basal area:** average: 1.7 m<sup>2</sup>/ha; range: 1.0 - 2.2 m<sup>2</sup>/ha; std. deviation: 0.6 m<sup>2</sup>/ha; (3 sites)

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

Most frequent species (up to 6):

*Lophostemon confertus* (12.9, 17.1), *Allocasuarina littoralis* (9.7, 9.2), *Eucalyptus acmenoides* (6.5, 7.0), *Allocasuarina torulosa* (3.2, 3.0), *Mallotus philippensis* (3.2, 0.3), *Acacia disparrima subsp. disparrima* (3.2, 0.0)

Additional species:

*Exocarpos cupressiformis* (3.2, 0.0), *Hardenbergia violacea* (3.2, 0.0), *Logania albiflora* (3.2, 0.0), *Psychotria daphnoides var. daphnoides* (3.2, 0.0), *Syncarpia glomulifera subsp. glomulifera* (3.2, 0.0)

### **Stratum: Shrub 1**

**Height:** average: 2.08m; range: 0.50 - 5.00m; (28 sites)

**Crown Cover:** average: 9.7%; range: 0.0 - 42.0%; (28 sites)

**Stem Count:** average: 1,050 stems/ha; range: 20 - 2,760 stems/ha; std. deviation: 1,173.5 stems/ha; (9 sites)

**Basal area:** average: 3.2 m<sup>2</sup>/ha; range: 1.0 - 7.0 m<sup>2</sup>/ha; std. deviation: 2.0 m<sup>2</sup>/ha; (12 sites)

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

Most frequent species (up to 6):

*Acacia disparrima* subsp. *disparrima* (35.5, 2.0), *Acacia maidenii* (25.8, 3.5), *Xanthorrhoea latifolia* subsp. *latifolia* (22.6, 8.3), *Lantana camara*\* (22.6, 2.2), *Alphitonia excelsa* (22.6, 0.7), *Macrozamia miquelii* (19.4, 8.0)

Additional species:

*Lophostemon confertus* (16.1, 7.0), *Breynia oblongifolia* (16.1, 5.0), *Allocasuarina torulosa* (16.1, 4.7), *Pomaderris canescens* (16.1, 3.8), *Syncarpia glomulifera* subsp. *glomulifera* (16.1, 1.9), *Eucalyptus acmenoides* (16.1, 0.9), *Allocasuarina littoralis* (12.9, 12.0), *Daviesia wyattiana* (12.9, 10.2), *Acacia irrorata* subsp. *irrorata* (12.9, 10.0), *Acrotriche aggregata* (12.9, 2.0), *Cinnamomum camphora*\* (12.9, 1.2), *Corymbia trachyphloia* subsp. *trachyphloia* (12.9, 1.0), *Pultenaea villosa* (12.9, 1.0), *Xanthorrhoea latifolia* (9.7, 5.7), *Glochidion ferdinandi* var. *ferdinandi* (9.7, 5.0), *Banksia integrifolia* subsp. *compar* (9.7, 0.0), *Clerodendrum floribundum* (9.7, 0.0), *Persoonia sericea* (9.7, 0.0), *Hibbertia aspera* subsp. *aspera* (6.5, 2.0), *Elaeocarpus obovatus* (6.5, 1.0), *Cinnamomum oliveri* (6.5, 0.2), *Elaeocarpus reticulatus* (6.5, 0.0), *Neolitsea dealbata* (6.5, 0.0), *Psychotria daphnoides* var. *daphnoides* (6.5, 0.0), *Solanum stelligerum* (6.5, 0.0), *Cryptocarya* (3.2, 2.6), *Acacia leiocalyx* subsp. *leiocalyx* (3.2, 1.0), *Acacia melanoxylon* (3.2, 1.0), *Brachychiton acerifolius* (3.2, 1.0), *Glochidion lobocarpum* (3.2, 1.0), *Jagera pseudorhus* var. *pseudorhus* (3.2, 1.0), *Pleioluma queenslandica* (3.2, 1.0), *Angophora subvelutina* (3.2, 0.6), *Acacia implexa* (3.2, 0.2), *Ficus opposita* (3.2, 0.2), *Sterculia quadrifida* (3.2, 0.2), *Acacia flavescens* (3.2, 0.0), *Acacia penninervis* var. *longiracemosa* (3.2, 0.0), *Acalypha eremorum* (3.2, 0.0), *Alangium polyosmoides* subsp. *tomentosum* (3.2, 0.0), *Alyxia ruscifolia* (3.2, 0.0), *Arytera divaricata* (3.2, 0.0), *Astrotricha latifolia* (3.2, 0.0), *Brachychiton populneus* subsp. *trilobus* (3.2, 0.0), *Callicarpa pedunculata* (3.2, 0.0), *Capparis arborea* (3.2, 0.0), *Cissus hypoglauca* (3.2, 0.0), *Claoxylon australe* (3.2, 0.0), *Cordyline murchisoniae* (3.2, 0.0), *Cryptocarya macdonaldii* (3.2, 0.0), *Cryptocarya triplinervis* (3.2, 0.0), *Cycas megacarpa* (3.2, 0.0), *Dissiliaria baloghioides* (3.2, 0.0), *Dodonaea lanceolata* (3.2, 0.0), *Drypetes deplanchei* (3.2, 0.0), *Elaeocarpus kirtonii* (3.2, 0.0), *Euroschinus falcatus* var. *falcatus* (3.2, 0.0), *Ficus rubiginosa* (3.2, 0.0), *Gmelina leichhardtii* (3.2, 0.0), *Guioa semiglauca* (3.2, 0.0), *Hibbertia aspera* (3.2, 0.0), *Hibiscus divaricatus* (3.2, 0.0), *Hibiscus heterophyllus* (3.2, 0.0), *Jacksonia scoparia* (3.2, 0.0), *Logania albiflora* (3.2, 0.0), *Mallotus philippensis* (3.2, 0.0), *Melaleuca hemisticta* (3.2, 0.0), *Melaleuca salicina* (3.2, 0.0), *Monotoca scoparia* (3.2, 0.0), *Muehlenbeckia rhyticarya* (3.2, 0.0), *Pigea stellarioides* (3.2, 0.0), *Rhysotoechia bifoliolata* subsp. *bifoliolata* (3.2, 0.0), *Solanum viridifolium* (3.2, 0.0), *Tabernaemontana pandacaqui* (3.2, 0.0), *Wilkiea macrophylla* (3.2, 0.0), *Xanthorrhoea glauca* subsp. *glauca* (3.2, 0.0), *Zieria smithii* (3.2, 0.0)

## Stratum: Shrub 2

**Height:** average: 1.50m; range: 0.50 - 2.50m; (2 sites)

**Crown Cover:** average: 2.9%; range: 0.7 - 5.0%; (2 sites)

**Stem Count:** No data available.

**Basal area:** No data available.

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

Most frequent species (up to 6):

*Lophostemon confertus* (3.2, 5.0), *Grewia latifolia* (3.2, 0.3), *Glochidion lobocarpum* (3.2, 0.2), *Lantana camara*\* (3.2, 0.2), *Bursaria*

*spinosa* subsp. *spinosa* (3.2, 0.0), *Hibbertia aspera* (3.2, 0.0)

Additional species:

*Indigofera pratensis* (3.2, 0.0), *Sida cordifolia*\* (3.2, 0.0), *Sida hackettiana* (3.2, 0.0)

## Stratum: Ground

**Height:** average: 0.67m; range: 0.40 - 1.00m; (18 sites)

**Projective foliage cover (PFC):** average: 42.2%; range: 5.0 - 90.0%; (18 sites)

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

**Grass - perennial:**

Most frequent species (up to 6):

*Imperata cylindrica* (88.9, 2.5), *Digitaria parviflora* (72.2, 2.0), *Themeda triandra* (72.2, 23.9), *Entolasia stricta* (55.6, 1.1), *Opismenus aemulus* (50.0, 0.7), *Arundinella nepalensis* (44.4, 14.8)

Additional species:

*Ottochloa nodosa* (33.3, 26.0), *Panicum effusum* (33.3, 4.0), *Cymbopogon refractus* (27.8, 10.0), *Sarga leiocladum* (27.8, 20.0), *Entolasia marginata* (16.7, 0.0), *Oplismenus imbecillis* (16.7, 0.0), *Paspalidium gausum* (16.7, 1.0), *Poa cheelii* (16.7, 0.0), *Alloterpopsis semialata* (11.1, 15.0), *Capillipedium spicigerum* (11.1, 5.0), *Eragrostis spartinooides* (11.1, 5.0), *Eremochloa bimaculata* (11.1, 0.0), *Ottochloa gracillima* (11.1, 5.1), *Panicum simile* (11.1, 0.0), *Aristida queenslandica* var. *queenslandica* (5.6, 0.0), *Bothriochloa decipiens* var. *decipiens* (5.6, 10.0), *Digitaria didactyla*\* (5.6, 0.0), *Digitaria eriantha*\* (5.6, 0.0), *Digitaria ramularis* (5.6, 3.0), *Echinopogon nutans* var. *nutans* (5.6, 0.0), *Echinopogon ovatus* (5.6, 0.0), *Eragrostis curvula*\* (5.6, 0.0), *Heteropogon contortus* (5.6, 2.0), *Microlaena stipoides* var. *stipoides* (5.6, 0.0), *Paspalidium aversum* (5.6, 0.0), *Paspalum scrobiculatum* (5.6, 0.0), *Setaria pumila* subsp. *subtesselata*\* (5.6, 0.0), *Sporobolus creber* (5.6, 15.0)

**Grass - annual/biennial:**

Most frequent species (up to 6):

*Urochloa foliosa* (5.6, 0.0),

Additional species:

**Forbs & other:**

Most frequent species (up to 6):

*Eustrephus latifolius* (94.4, 0.3), *Brunoniella australis* (77.8, 0.7), *Cyanthillium cinereum* (72.2, 0.0), *Desmodium rhytidophyllum* (72.2, 1.5), *Goodenia rotundifolia* (66.7, 5.0), *Sigesbeckia orientalis* (55.6, 0.0)

Additional species:

*Acrotiche aggregata* (50.0, 0.2), *Gymnostachys anceps* (50.0, 1.0), *Lomandra longifolia* (50.0, 2.7), *Alphitonia excelsa* (44.4, 0.0), *Desmodium gunnii* (44.4, 0.0), *Lepidosperma laterale* (44.4, 0.7), *Lobelia purpurascens* (44.4, 0.2), *Commelina diffusa* (38.9, 0.0), *Dianella caerulea* (38.9, 2.7), *Hibbertia aspera* (38.9, 0.0), *Pigea stellarioides* (38.9, 0.0), *Scleria brownii* (38.9, 0.0), *Breynia oblongifolia* (33.3, 0.0), *Dianella* (33.3, 0.0), *Drynaria rigidula* (33.3, 0.0), *Eucalyptus acmenoides* (33.3, 0.8), *Gahnia aspera* (33.3, 1.0), *Glochidion ferdinandi* var. *ferdinandi* (33.3, 0.0), *Glycine clandestina* var. *clandestina* (33.3, 0.2), *Lomandra filiformis* subsp. *filiformis* (33.3, 0.4), *Lomandra multiflora* subsp. *multiflora* (33.3, 7.7), *Pseuderanthemum variabile* (33.3, 1.0), *Smilax glycyphylla* (33.3, 0.0), *Cassytha filiformis* (27.8, 0.7), *Dioscorea transversa* (27.8, 0.0), *Fimbristylis dichotoma* (27.8, 0.0), *Glycine tabacina* (27.8, 0.5), *Lomandra laxa* (27.8, 1.0), *Oxalis comiculata*\* (27.8, 1.0), *Passiflora aurantia* var. *aurantia* (27.8, 0.0), *Pteridium esculentum* (27.8, 30.0), *Smilax australis* (27.8, 0.0), *Adiantum hispidulum* (22.2, 0.0), *Alpinia caerulea* (22.2, 0.0), *Clematicissus opaca* (22.2, 0.0), *Crotalaria montana* (22.2, 0.0), *Curculigo ensifolia* var. *ensifolia* (22.2, 0.0), *Galactia tenuiflora* (22.2, 0.0), *Hardenbergia violacea* (22.2, 1.0), *Lophostemon confertus* (22.2, 3.0), *Parsonsia straminea* (22.2, 0.0), *Phyllanthus virgatus* (22.2, 0.0), *Pittosporum revolutum* (22.2, 0.0), *Viola hederacea* (22.2, 0.0), *Ageratum houstonianum*\* (16.7, 0.0), *Astrotricha intermedia* (16.7, 0.0), *Bidens pilosa*\* (16.7, 0.0), *Causonis clematidea* (16.7, 0.0), *Chamaecrista mimosoides* (16.7, 0.0), *Cinnamomum camphora*\* (16.7, 0.0), *Corymbia intermedia* (16.7, 0.0), *Cyperus cyperoides* (16.7, 0.0), *Daviesia wyattiana* (16.7, 0.6), *Desmodium varians* (16.7, 0.0), *Elaeocarpus obovatus* (16.7, 0.0), *Emilia sonchifolia*\* (16.7, 0.0), *Flemingia parviflora* (16.7, 0.0), *Gomphocarpus physocarpus*\* (16.7, 0.0), *Hibbertia scandens* (16.7, 0.0), *Jagera pseudorhus* var. *pseudorhus* (16.7, 0.0), *Lomandra confertifolia* subsp. *pallida* (16.7, 0.4), *Macrozamia miquelii* (16.7, 0.0), *Melodinus australis* (16.7, 0.0), *Myoporum acuminatum* (16.7, 0.0), *Myrsine variabilis* (16.7, 0.0), *Passiflora suberosa*\* (16.7, 0.2), *Persoonia amaliae* (16.7, 0.0), *Pigea enneasperma* (16.7, 0.2), *Psychotria daphnoides* var. *daphnoides* (16.7, 0.0), *Rubus moluccanus* var. *trilobus* (16.7, 0.0), *Spermacoce brachystema* (16.7, 0.0), *Xanthorrhoea johnsonii* (16.7, 3.0), *Abildgaardia ovata* (11.1, 2.0), *Acacia disparima* subsp. *disparima* (11.1, 0.0), *Acacia maidenii* (11.1, 0.0), *Allocasuarina torulosa* (11.1, 0.0), *Apowollastonia spilanthisoides* (11.1, 0.0), *Aristolochia pubera* (11.1, 0.0), *Blechnum cartilagineum* (11.1, 0.0), *Calochlaena dubia* (11.1, 5.0), *Chrysocephalum apiculatum* (11.1, 0.0), *Cissus hypoglauca* (11.1, 0.0), *Coleus australis* (11.1, 0.0), *Commelina lanceolata* (11.1, 0.0), *Cordylina rubra* (11.1, 0.0), *Corymbia trachyphloia* subsp. *trachyphloia* (11.1, 3.0), *Crotalaria medicaginea* (11.1, 0.0), *Davallia pyxidata* (11.1, 0.0), *Desmodium brachypodum* (11.1, 0.0), *Euroschinus falcatus* var. *falcatus* (11.1, 0.0), *Geodorum densiflorum* (11.1, 0.0), *Glycine tomentella* (11.1, 0.0), *Hibbertia aspera* subsp. *aspera* (11.1, 0.4), *Indigofera hirsuta* (11.1, 0.0), *Jasminum didymum* subsp. *racemosum* (11.1, 0.0), *Lantana camara*\* (11.1, 0.0), *Mallotus philippensis* (11.1, 0.0), *Marsdenia* (11.1, 0.0), *Murdannia graminea* (11.1, 0.0), *Passiflora edulis*\* (11.1, 0.0), *Passiflora subpeltata*\* (11.1, 0.0), *Peripleura hispidula* var. *hispidula* (11.1, 0.0), *Polygala japonica* (11.1, 0.0), *Polymeria calycina* (11.1, 0.0), *Pomaderris argyrophylla* (11.1, 0.0), *Pultenaea villosa* (11.1, 0.2), *Rostellularia adscendens* (11.1, 0.2), *Rubus parvifolius* (11.1, 0.0), *Scleria mackaviensis* (11.1, 0.0), *Sida rhombifolia*\* (11.1, 0.0), *Solanum nigrum*\* (11.1, 0.0), *Syncarpia glomulifera* subsp. *glomulifera* (11.1, 0.4), *Tabernaemontana pandacaqui* (11.1, 0.0), *Thysanotus tuberosus* (11.1, 0.0), *Tragia novae-hollandiae* (11.1, 0.0), *Tricoryne anceps* (11.1, 3.0), *Viola betonicifolia* (11.1, 4.0), *Xanthorrhoea latifolia* subsp. *latifolia* (11.1, 5.0), *Acacia flavescens* (5.6, 0.0), *Acacia irrorata* subsp. *irrorata* (5.6, 0.0), *Acacia penninervis* (5.6, 0.0), *Adiantum aethiopicum* (5.6, 0.0), *Aeschynomene brevifolia* (5.6, 0.0), *Ajuga australis* (5.6, 0.0), *Allocasuarina littoralis* (5.6, 0.0), *Alyxia ruscifolia* (5.6, 0.0), *Araucaria cunninghamii* var. *cunninghamii* (5.6, 0.0), *Artanema fimbriatum* (5.6, 0.0), *Asplenium paleaceum* (5.6, 0.0), *Banksia integrifolia* subsp. *integrifolia* (5.6, 0.0), *Billardiera scandens* (5.6, 0.0), *Blechnum doodianum* (5.6, 0.0), *Blechnum neohollandicum* (5.6, 0.0), *Blechnum rupestre* (5.6, 0.0), *Callicarpa pedunculata* (5.6, 0.0), *Carex breviculmis* (5.6, 0.0), *Cassytha pubescens* (5.6, 0.0), *Celastrus subspicatus* (5.6, 0.0), *Centella asiatica* (5.6, 0.0), *Chamaecrista absus* var. *absus* (5.6, 0.0), *Cheilanthes sieberi* subsp. *sieberi* (5.6, 0.0), *Cloaxylon australe* (5.6, 0.0), *Cloaxylon tenerifolium* (5.6, 0.0), *Comesperma hispidulum* (5.6, 0.0), *Commelina* (5.6, 0.0), *Crotalaria lanceolata* subsp. *lanceolata*\* (5.6, 0.0), *Cryptocarya* (5.6, 0.0), *Cryptocarya triplinervis* (5.6, 0.0), *Cymbidium*



*madidum* (5.6, 0.0), *Cyperus flaccidus* (5.6, 0.0), *Cyperus fulvus* (5.6, 0.0), *Cyperus gracilis* (5.6, 0.0), *Cyperus leiocaulon* (5.6, 0.0), *Denhamia celastroides* (5.6, 0.0), *Denhamia disperma* (5.6, 0.0), *Desmodium gangeticum* (5.6, 0.0), *Desmodium heterocarpon* var. *heterocarpon* (5.6, 0.0), *Dianella caerulea* var. *vannata* (5.6, 0.0), *Diospyros geminata* (5.6, 0.0), *Dodonaea lanceolata* (5.6, 0.0), *Elaeocarpus reticulatus* (5.6, 0.0), *Euphorbia bifida* (5.6, 0.0), *Euphorbia hirta*\* (5.6, 0.0), *Eupomatia bennettii* (5.6, 0.0), *Evolvulus alsinoides* (5.6, 0.0), *Flagellaria indica* (5.6, 0.0), *Glochidion lobocarpum* (5.6, 0.0), *Glossocardia bidens* (5.6, 0.0), *Glycine clandestina* var. *sericea* (5.6, 0.0), *Gompholobium pinnatum* (5.6, 0.0), *Goodenia glabra* (5.6, 0.0), *Goodenia* sp. (Mt Castletower M.D.Crisp 2753) (5.6, 0.0), *Guioa semiglauca* (5.6, 0.0), *Hibbertia linearis* var. *obtusifolia* (5.6, 0.0), *Hibiscus splendens* (5.6, 0.0), *Homalanthus populifolius* (5.6, 0.0), *Hypericum gramineum* (5.6, 0.0), *Hypoxis arillacea* (5.6, 0.0), *Hypoxis pratensis* var. *pratensis* (5.6, 0.0), *Indigofera australis* (5.6, 0.0), *Iphigenia indica* (5.6, 0.0), *Jacquemontia paniculata* (5.6, 0.0), *Jasminum simplicifolium* subsp. *australiense* (5.6, 0.0), *Knoxia sumatrensis* (5.6, 0.0), *Lagenophora sublyrata* (5.6, 0.0), *Leichhardtia brevis* (5.6, 0.0), *Leichhardtia coronata* (5.6, 0.0), *Leichhardtia rostrata* (5.6, 0.0), *Leucas decemdentata* (5.6, 0.0), *Logania albiflora* (5.6, 0.0), *Lomandra* (5.6, 0.0), *Lordhowea amygdalifolia* (5.6, 0.0), *Malvastrum coromandelianum* subsp. *coromandelianum*\* (5.6, 0.0), *Mecardonia procumbens*\* (5.6, 0.0), *Melodorum leichhardtii* (5.6, 0.0), *Mentha satuireioides* (5.6, 0.0), *Oxalis chnoodes* (5.6, 0.2), *Pandorea pandorana* (5.6, 0.0), *Persoonia virgata* (5.6, 0.0), *Phyllanthus gunnii* (5.6, 0.0), *Physalis*\* (5.6, 0.0), *Picris angustifolia* subsp. *carolorum-hennicorum* (5.6, 0.0), *Pimelea altior* (5.6, 0.0), *Pimelea linifolia* subsp. *linifolia* (5.6, 0.0), *Polyscias elegans* (5.6, 0.0), *Poranthera microphylla* (5.6, 0.0), *Psychotria loniceroides* (5.6, 0.0), *Psydrax odorata* (5.6, 0.0), *Ranunculus* (5.6, 0.0), *Rhodamnia rubescens* (5.6, 0.0), *Rhynchosia minima* (5.6, 0.0), *Richardia brasiliensis*\* (5.6, 0.0), *Ripogonum album* (5.6, 0.0), *Rubus probus* (5.6, 0.0), *Rubus rosifolius* var. *rosifolius* (5.6, 0.0), *Solanum stelligerum* (5.6, 0.0), *Stackhousia monogyna* (5.6, 0.0), *Stackhousia spathulata* (5.6, 0.0), *Streblus brunonianus* (5.6, 0.0), *Tephrosia filipes* (5.6, 0.0), *Tephrosia juncea* (5.6, 0.0), *Tephrosia rufula* (5.6, 0.0), *Tetrastigma nitens* (5.6, 0.0), *Trachymene procumbens* (5.6, 0.0), *Trema tomentosa* var. *aspera* (5.6, 0.0), *Veronica plebeia* (5.6, 0.0), *Youngia japonica* (5.6, 0.0), *Zornia dyctiocarpa* var. *dyctiocarpa* (5.6, 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.