



South East Queensland Horse Trail Network Interim Assessment: Woondum National Park



Queensland
Government

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

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Cover Photo taken at Woondum 41082 horse trail monitoring site on 11th Sept 2019 (Ngugi and Neldner).

Contents

Introduction:.....	4
Methods:	5
Results:	9
Discussion and Conclusions.....	12
Bibliography.....	13
Appendix I. Site report cards	15
Woondum National Park 13979	16
Woondum National Park 13979A.....	17
Woondum National Park 13979B.....	20
Woondum National Park 41080	23
Woondum National Park 41080A.....	24
Woondum National Park 41080B.....	27
Woondum National Park 41082	30
Woondum National Park 41082A.....	31
Woondum National Park 41082B.....	34
Appendix II. Technical Descriptions and Benchmarks	37
12.11.5.....	38
12.12.15.....	43

Introduction:

Woondum National Park contains a diverse landscape and range of ecosystems close to Gympie and is characterised by hills and mountains covered in tall eucalypt forest and rainforest, and cascading boulder-strewn creeks dominate the landscape in this region (QPWS 2013). Many areas of Woondum have been selectively logged, several as recently as the late 1990s. The 4,001ha area of Woondum National Park was gazetted in 2009 from Woondum Forest Reserve 1. Prior to 2001, Woondum Forest Reserve 1 was gazetted as Woondum State Forest 393 (QPWS 2013). In 1995, 380ha of the northwestern part of Woondum State Forest was declared a scientific area (Woondum 1 – Mothar Mountain Scientific Area 65) under the Forestry Act 1959 for its significant areas of rainforest, scribbly gum and other forests on a geology unique to the region, as well as its scenic qualities (DPI 1996). The scientific area was later converted to national park. The national park also has significant recreational value to the local community and visiting tour groups for horse riding, four-wheel-drive vehicle touring and walking. The park is covered by a native title claim (claim no.: QC2013/003) on behalf of the Kabi Kabi First Nation 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 (Potito and Beatty 2005; Ansong and Pickering 2013). Once established in disturbed road verges, some invasive species may colonise adjacent undisturbed native vegetation (Ngugi *et al.* 2014).

Non-native plant 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)**).

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

Woondum National Park covers an area of 3825.8 ha and was assessed at three sites containing a total of six transects spanning two Regional Ecosystems (REs). The regional ecosystems are RE 12.12.15 and 12.11.15 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 Woondum NP arranged by regional ecosystem.

Regional Ecosystem	Surface area (ha)	Proportion of park/reserve (%)	No. of transects
12.12.15 <i>Corymbia intermedia</i> +/- <i>Eucalyptus propinqua</i> , <i>E. siderophloia</i> , <i>E. microcorys</i> , <i>Lophostemon confertus</i> open forest on Mesozoic to Proterozoic igneous rocks	1082.6	28.3	4
12.11.5 <i>Corymbia citriodora</i> subsp. <i>variegata</i> woodland to open forest +/- <i>Eucalyptus siderophloia</i> / <i>E. crebra</i> , <i>E. carnea</i> , <i>E. acmenoides</i> , <i>E. propinqua</i> on metamorphics +/- interbedded volcanics	20.4	0.5	2

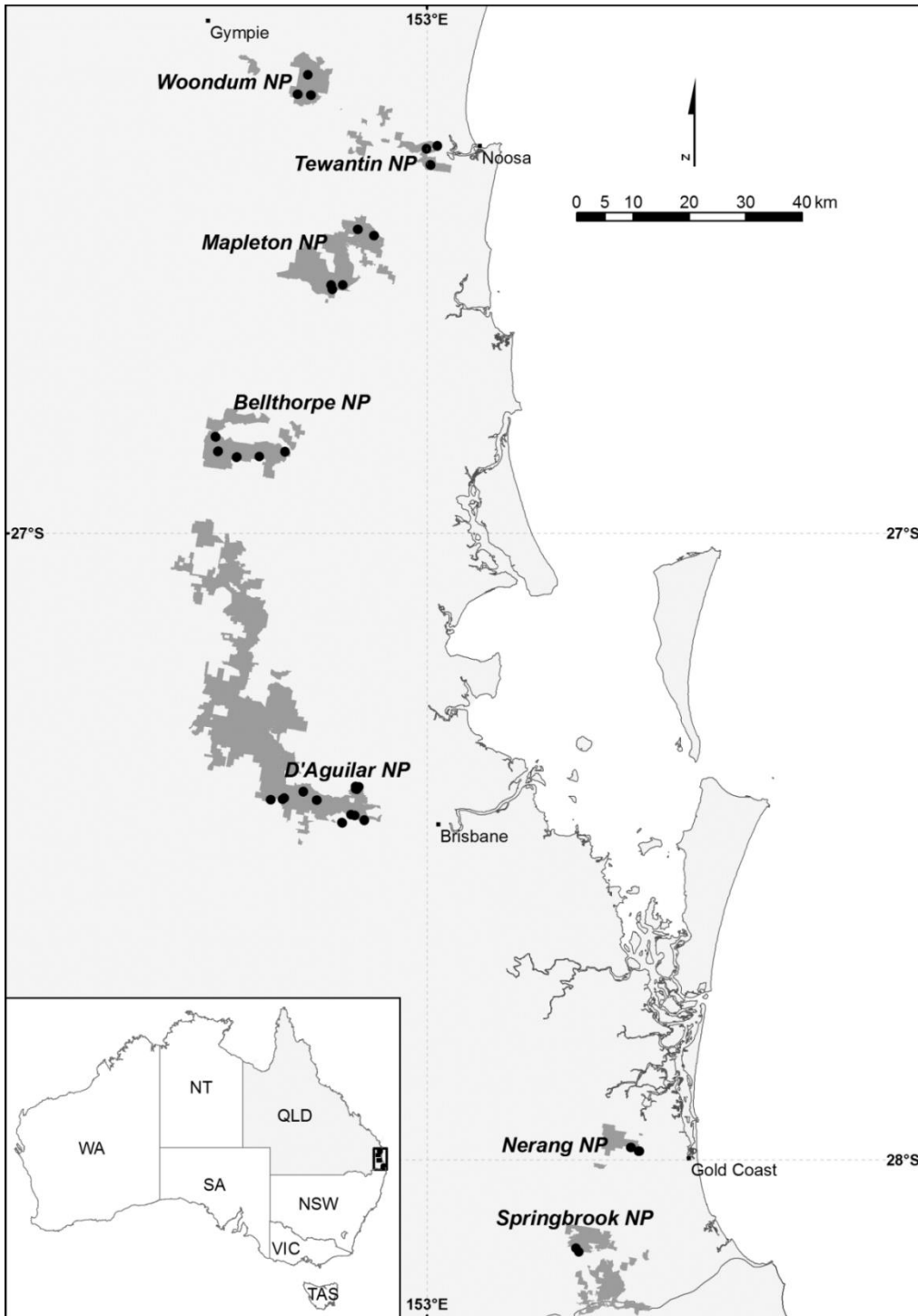


Figure 1. Map of Australia showing Queensland State, location of the seven National Parks (NP) in southeast Queensland that have designated horse trail network, and distribution and location of study sites (Ngugi *et al.* 2014).

Site selection and Sampling

Permanent sites for vegetation monitoring were established in 2012 along the horse trail network in Woondum National Park and monitored in 2016 and 2019. Sites were overlaid where possible on existing ecological research plots used for vegetation mapping and classification purposes (Neldner *et al.* 2022), or native forest permanent plots used for long-term monitoring of forest growth (Ngugi *et al.*

2015) allowing surveys to add to existing valuable datasets. The data collection method is described in Ngugi *et al* (2014).

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

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

1. 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 2021). Characterisation of species as environmental weeds, weeds of national significance and/ or declared weeds under State legislation was done using the online facility maintained by the Queensland Department of Agriculture, Fisheries and Forestry (QPWS 2022).

Results:

Woondum National Park was assessed at three sites containing a total of six transects across two Regional Ecosystems (RE's). Detailed results for the non-native species richness and vegetation cover, and BioCondition scores for the transects at each site are provided in the report cards in Appendix 1.

A summary of non-native plant species richness and cover in the trail-edge transect is presented in Table 2. The highest observed mean cover of non-native species was 5.5%, and the highest species richness was two species. Trail-edge sites in regional ecosystem 12.11.5 consistently showed higher cover and non-native species richness compared to RE 12.12.15 where no non-native species were recorded. Within the QBEIS transect, the highest mean cover of non-native species was 15.5% but some sites had high cover of up to 30% which was mainly composed of *Lantana camara* (Table 2). The highest mean of non-native species richness in the QBEIS transect was two species with at least one non-native species recorded during each site visit (Table 2).

BioCondition score among all the sites ranged from 61 to 88% on a 0 to 100% scale (the higher the score the better the condition) with the lowest mean score of 61% indicating that most sites were in reasonable condition (Table 3). The highest BioCondition scores were recorded in RE 12.12.15 with the mean ranging from 76 to 82%.

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 Woondum National Park. Values for both trail-edge and QBEIS transects are shown.

Regional Ecosystems	Sites	Site Visit	TRAIL-EDGE TRANSECTS				QBEIS TRANSECTS			
			Cover mean (%)	Cover range (%)	Species mean (count)	Species range (count)	Cover mean (%)	Cover range (%)	Species mean (count)	Species range (count)
12.11.5 <i>Corymbia citriodora</i> subsp. <i>variegata</i> woodland to open forest +/- <i>Eucalyptus siderophloia</i> / <i>E. crebra</i> , <i>E. carnea</i> , <i>E. acmenoides</i> , <i>E. propinqua</i> on metamorphics +/- interbedded volcanics	WO41082A, WO41082B	1	5.4	0 – 10.7	0	0 – 0.8	15.5	1 – 30	1	1
		2	0.4	0 – 0.8	2	0 – 3	2.1	0.1 – 4	2	1 – 2
		3	0.5	0.5	1	1	3.4	0 – 6.8	1	1
12.12.15 <i>Corymbia intermedia</i> +/- <i>Eucalyptus propinqua</i> , <i>E. siderophloia</i> , <i>E. microcorys</i> , <i>Lophostemon confertus</i> open forest on Mesozoic to Proterozoic igneous rocks	WO13979A, WO13979B, WO41080A, WO41080B	1	0	0	0	0	2.4	1 – 3.8	2	1 – 2
		2	0	0	0	0	4.3	0 – 12	1	1
		3	0	0	0	0	2.3	0.1 – 4.4	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 Woondum National Park.

Regional Ecosystems	Sites	Sampling Visit	BioCondition Mean	BioCondition Range
12.11.5 <i>Corymbia citriodora</i> subsp. <i>variegata</i> woodland to open forest +/- <i>Eucalyptus siderophloia</i> / <i>E. crebra</i> , <i>E. carnea</i> , <i>E. acmenoides</i> , <i>E. propinqua</i> on metamorphics +/- interbedded volcanics	WO41082A, WO41082B	1	75	66 - 83
		2	76	75 - 77
		3	76	69 - 82
12.12.15 <i>Corymbia intermedia</i> +/- <i>Eucalyptus propinqua</i> , <i>E. siderophloia</i> , <i>E. microcorys</i> , <i>Lophostemon confertus</i> open forest on Mesozoic to Proterozoic igneous rocks	WO13979A, WO13979B, WO41080A, WO41080B	1	76	65 - 85
		2	77	61 - 88
		3	82	78 - 85

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 Woondum 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 three sites (six transects) across three sampling time points (2012, 2016 and 2019), the majority of sites along designated horse trails in Woondum National Park showed little to no invasion by non-native species.

Collectively, the sites examined in the QBEIS forest transects showed a greater degree of incursion by non-native species than the trail-edge transects. This held true across both examined regional ecosystems, however the sites located within open forest dominated by *Corymbia intermedia* (with or without *Eucalyptus propinqua*, *E. siderophloia*, *E. microcorys*, *Lophostemon confertus*) and occurring on Mesozoic to Proterozoic igneous rocks (12.12.15) only had weed incursions in the QBEIS forest transects, with none found in the trail-edge.

Lantana camara was the most widely distributed non-native species found across Woondum National Park, although cover was low to moderate. This weed was identified in both the trail-edge transects and deeper forest transects for sites 41082A, 41082B and only in the forest transect at sites 41080A and 41080B. *Lantana camara* was present with limited cover at all these sites with the exception of site 41082B, in which it reached cover levels of up to 30% in 2012. However cover was significantly reduced following a fire in August 2013, before increasing to 6% cover by 2019.

The only other non-native species found in this national park was *Solanum seafortianum*, which only occurred at site 41082B both at the trail-edge and in the QBEIS forest site, but in 2016 it occurred only at the trail-edge.

BioCondition scores within the forest transects

Sites 13979A and 13979B all had consistently high BioCondition scores through time, despite the occurrence of a hot fire in October 2017. This fire was likely the reason for the low levels of coarse woody debris and grass species richness at site 13979A, as well as low perennial grass cover, coarse woody debris, subcanopy tree cover and forb richness. The 2017 hot fire killed many *Allocasuarina littoralis*, but stimulated a mass germination of the native scrambler *Kennedia rubicunda* which had high levels of cover persisting to 2021.

Site 41082A also had a consistently high BioCondition score despite showing consistently low levels of perennial ground layer cover and grass species richness. Sites 41080A, 41080B and 41082B all showed moderate BioCondition scores that varied through time. This was likely a result of the fire that occurred in August 2013 which may have been the reason for the reduction in various BioCondition attributes at these sites, such as perennial grass cover, grass species richness, ecologically dominant layer and subcanopy tree cover.

Conclusion

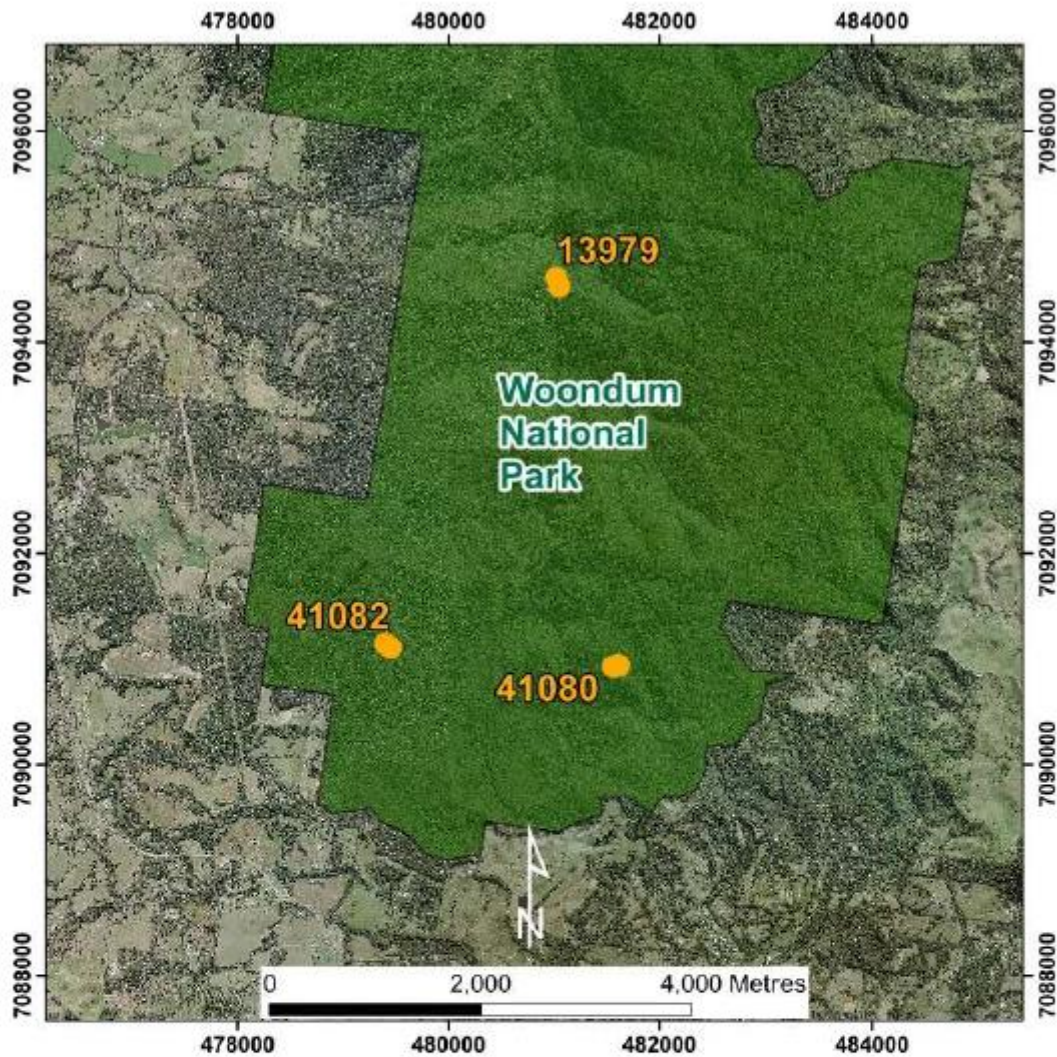
The threat of incursion of non-native species is present in Woondum National Park. This is mainly associated with active usage of trails for recreation and mechanical maintenance of the trails. QPWS&P management has kept up with trail edge maintenance and hence reducing incursion and spread of non-native species. However this maintenance should extend further to the adjacent vegetation to limit and timely control incursion and spread of non-native species that are gaining stronghold in the National Park. BioCondition scores were consistently moderate to high, with the moderate scores likely a result of the 2013 fire event. The monitoring should continue in order to inform long-term non-native species (pests) incursion and management.

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Appendix I. Site report cards



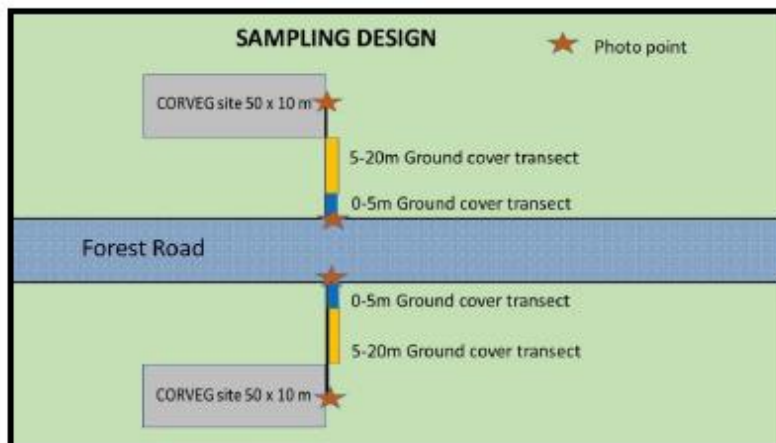
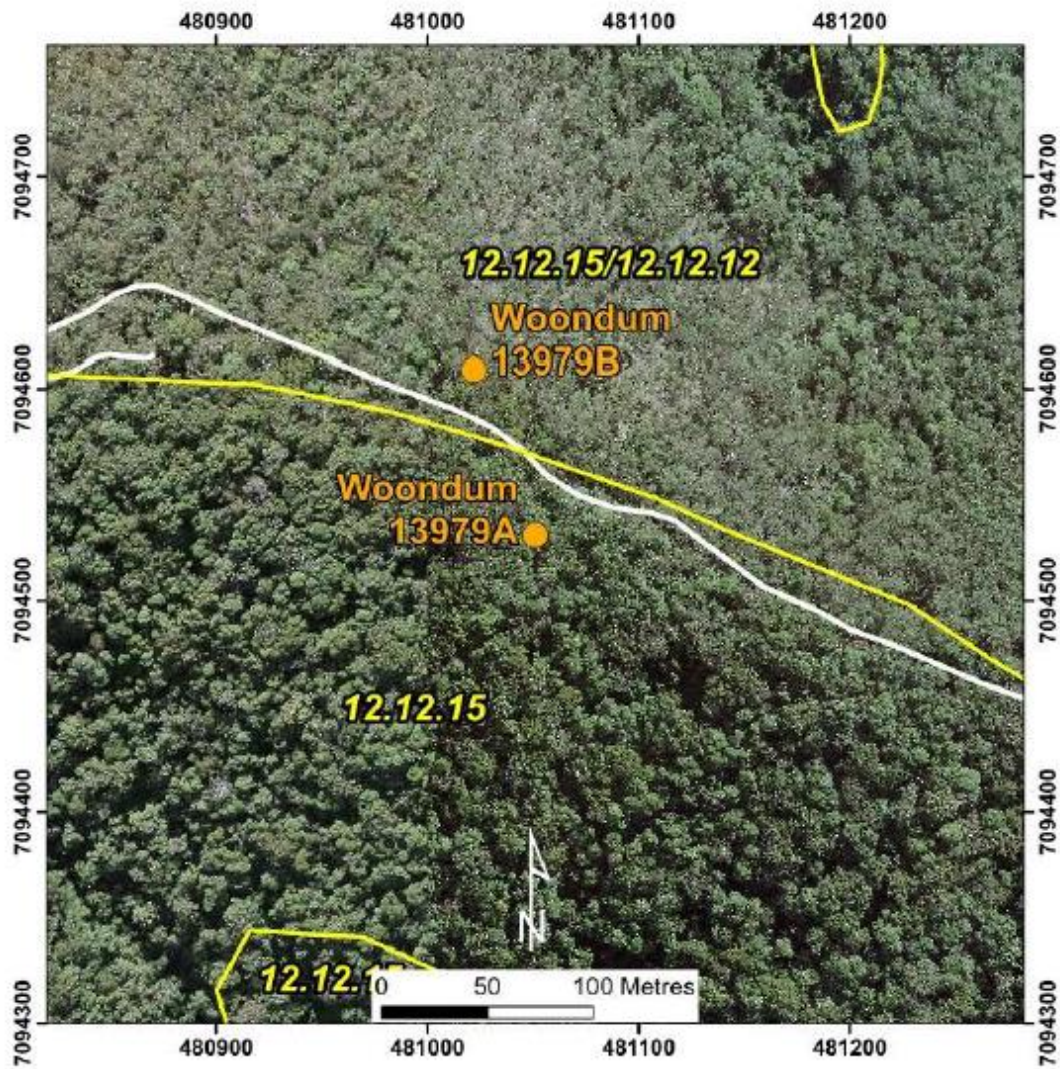
SEQ Monitoring Report Card

Woondum 13979A

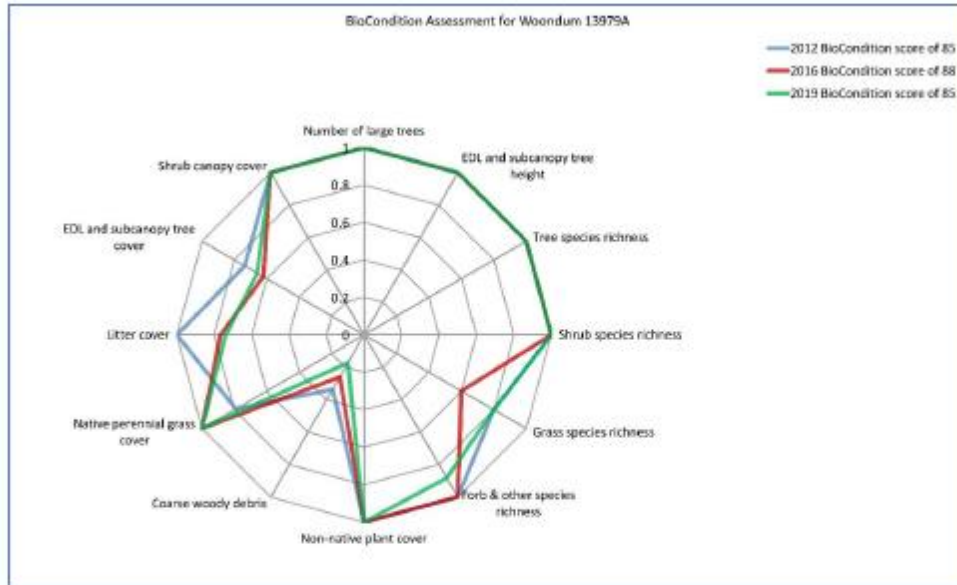
Regional Ecosystem 12.12.15

Eucalyptus acmenoides, *Eucalyptus resinifera*, *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: 2012 – 85 2016 – 88 2019 – 85
 Fire History: Burnt October 2017



Forest monitoring transect September 2016 Forest monitoring transect September 2019

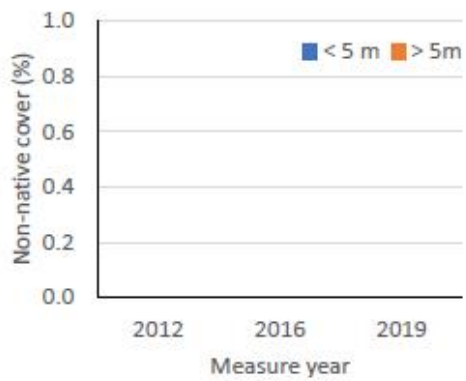
General Comments: This site consistently had a high BioCondition score. It had low levels of coarse woody debris, and lower grass species richness and tree layer canopy cover than the benchmark. The October 2017 fire did not significantly impact on the BioCondition score recorded in 2019. The QBEIS 13979 (site number 1987) was recorded nearby on 16th June 1998.

Trail-edge ground cover transect at Woondum 13979A

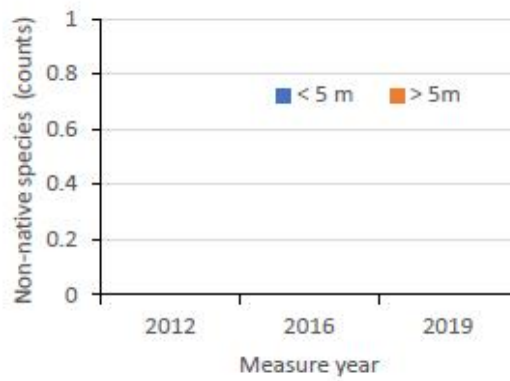


Trail-edge transect September 2016

Trail-edge transect September 2019

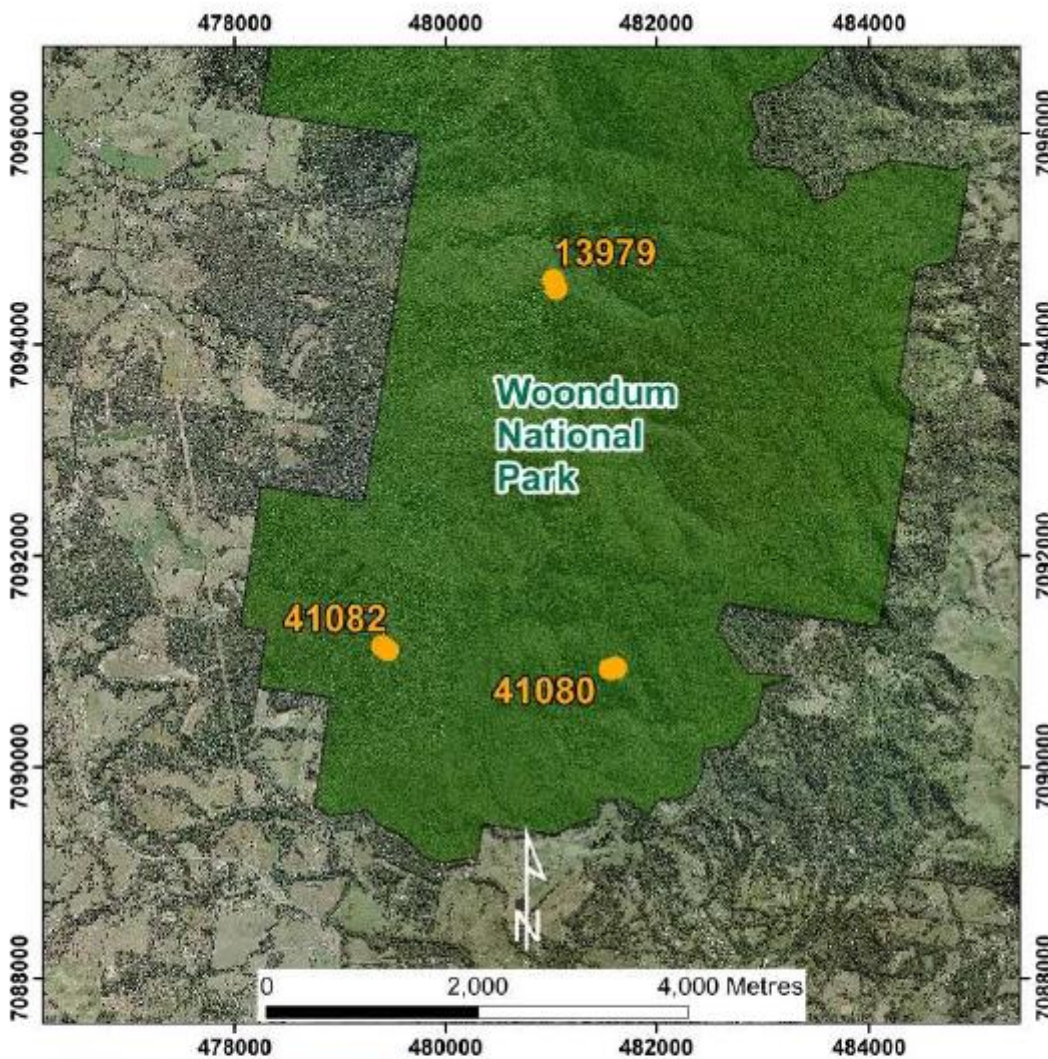


Non-native species cover



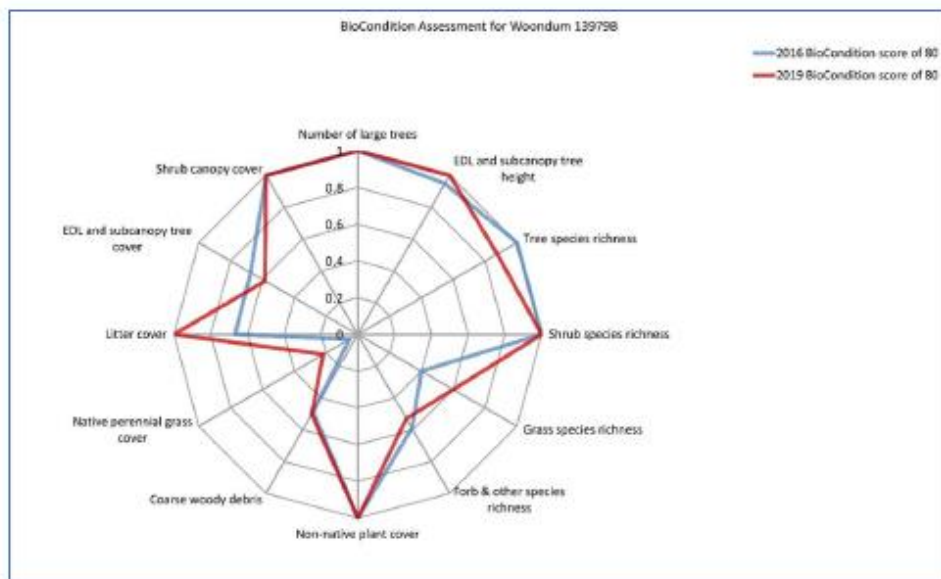
Number of non-native species

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



SEQ Monitoring Report Card
Woondum 13979B
Regional Ecosystem 12.12.15
Eucalyptus acmenoides, Corymbia intermedia, Lophostemon confertus
open forest
Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2016 – 80 2019 – 80
 Fire History: Burnt October 2017



Forest monitoring transect September 2016 Forest monitoring transect September 2019

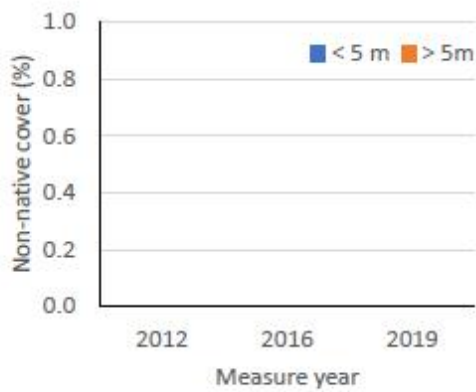
General Comments: This site had a relatively high BioCondition score at both samplings. It had a low amount of perennial grass cover, grass and forb richness, and CWD. A relatively hot fire in October 2017 killed a large number of *Allocasuarina littoralis* low trees which subsequently fell to the ground. The fire stimulated a mass germination of the native scrambler *Kennedia rubicunda* which still had a high cover in 2021.

Trail-edge ground cover transect at Woondum 13979B

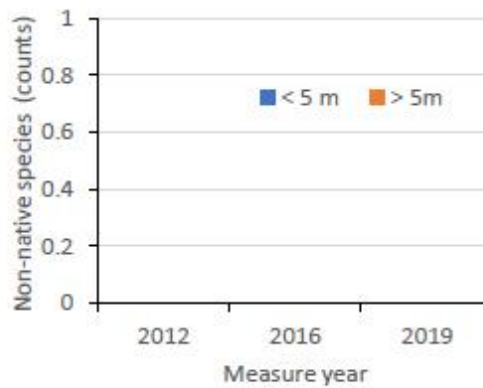


Trail-edge transect September 2016

Trail-edge transect September 2019



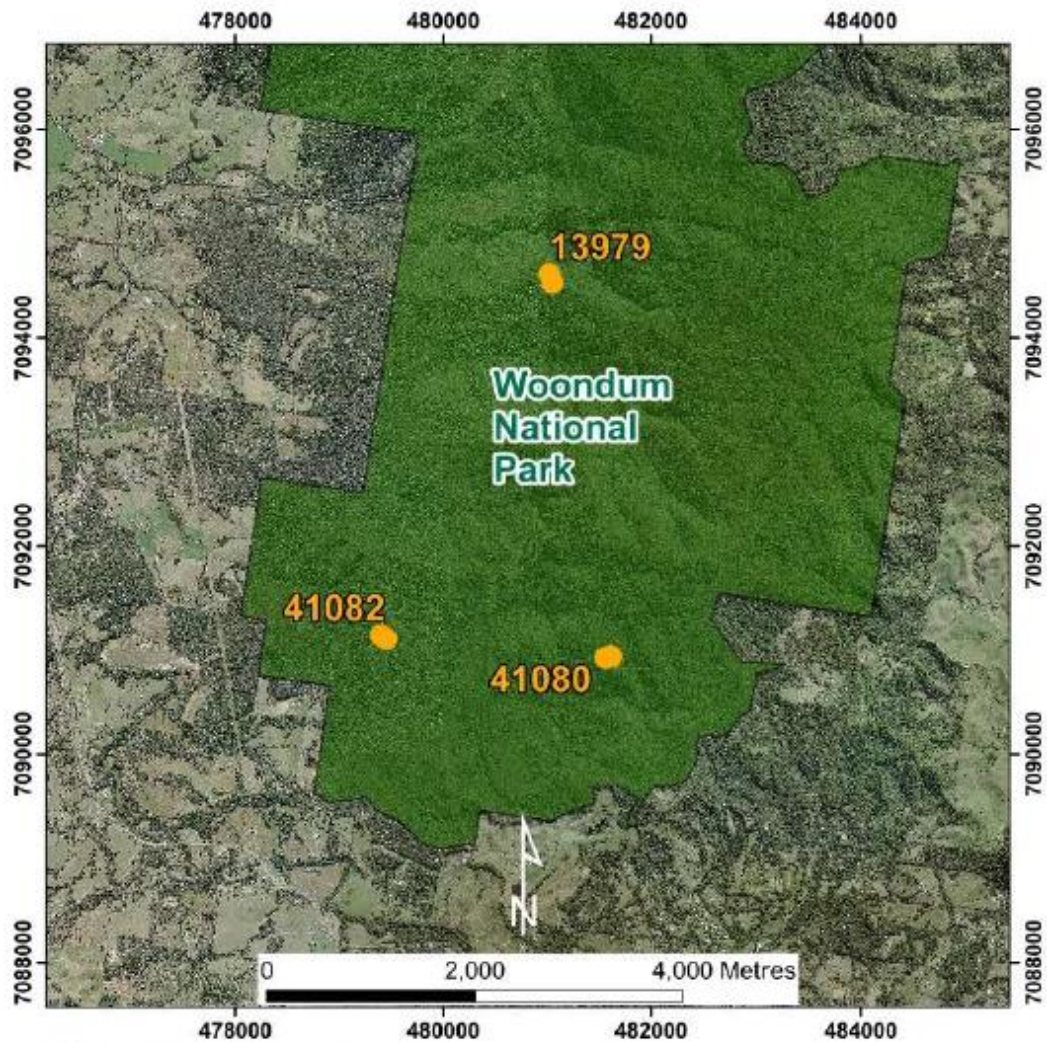
Non-native species cover



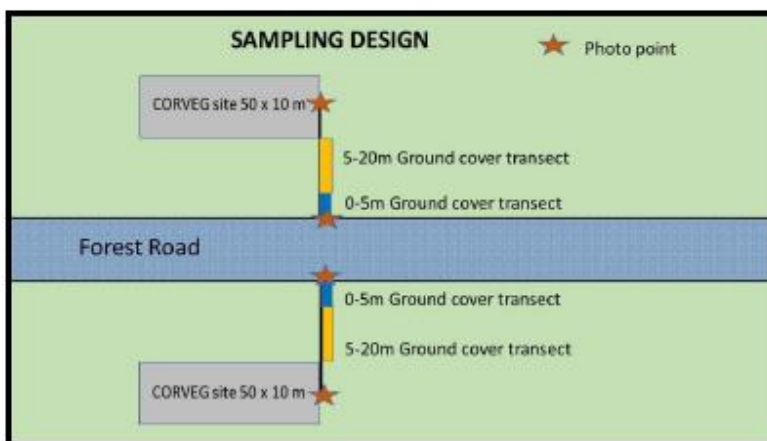
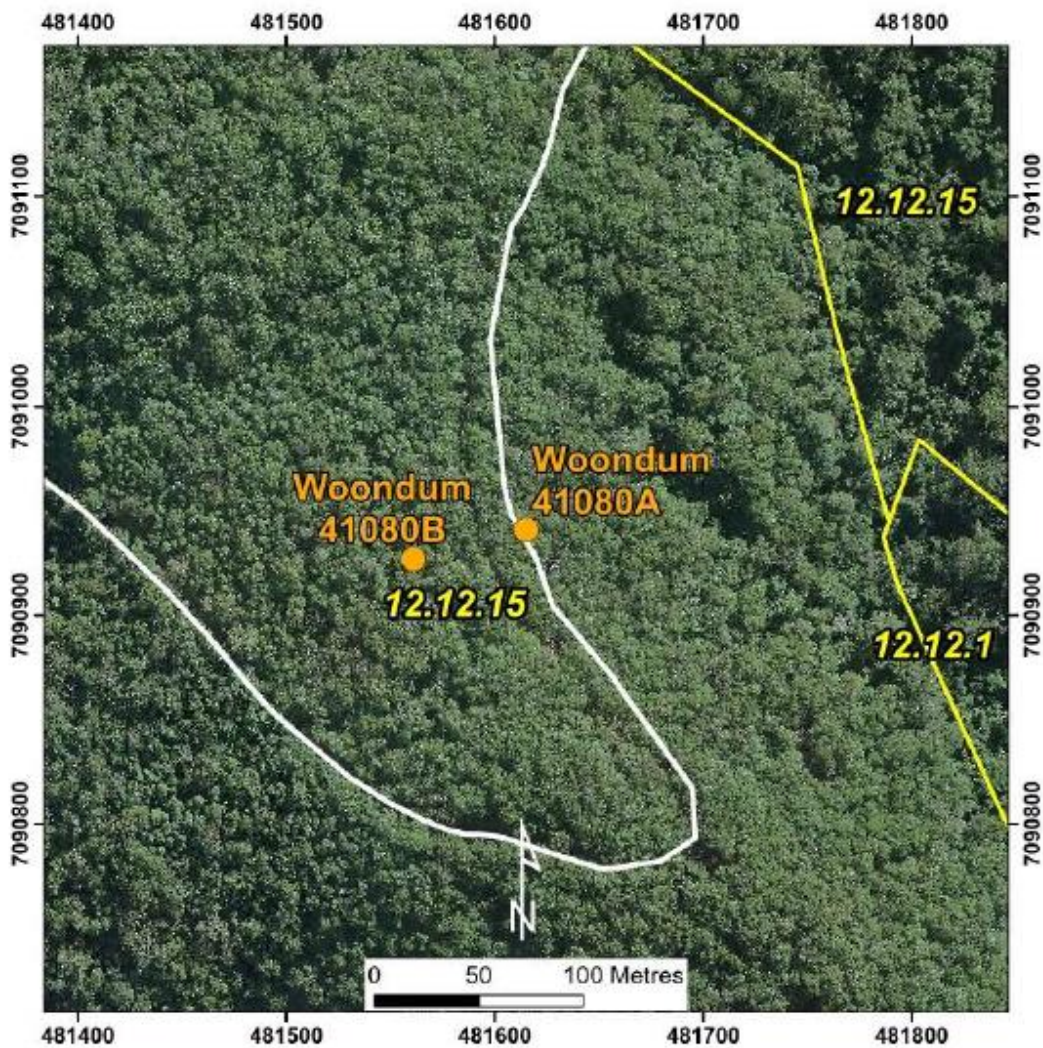
Number of non-native species

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

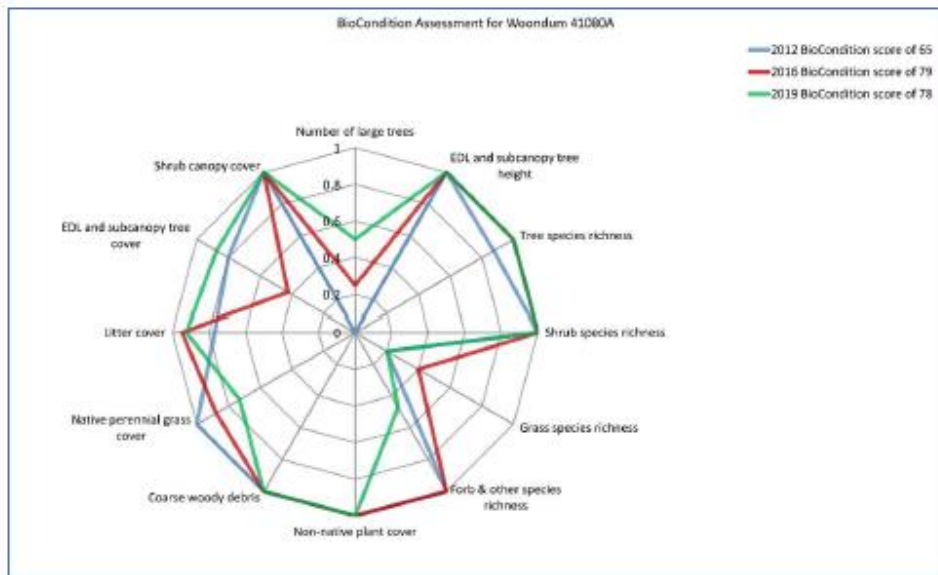
Woondum National Park: Site 41080



SEQ Monitoring Report Card
Woondum 41080A
Regional Ecosystem 12.12.15
Eucalyptus acmenoides, Eucalyptus microcorys, Eucalyptus resinifera, Eucalyptus siderophloia open forest
Queensland Herbarium, October 2021



QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 65 2016 – 79 2019 – 78
 Fire History: Burnt August 2013



Forest monitoring transect September 2016 Forest monitoring transect September 2019

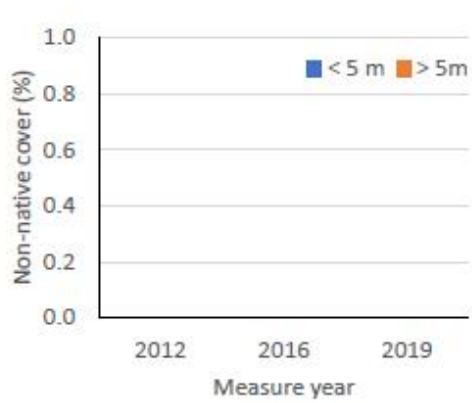
General Comments: This site had an increasing moderate BioCondition score. It has a low number of large trees that increased over the sampling period. The grass species richness was low at times, as was EDL and subcanopy tree canopy cover after the August 2013 fire.

Trail-edge ground cover transect at Woondum 41080A

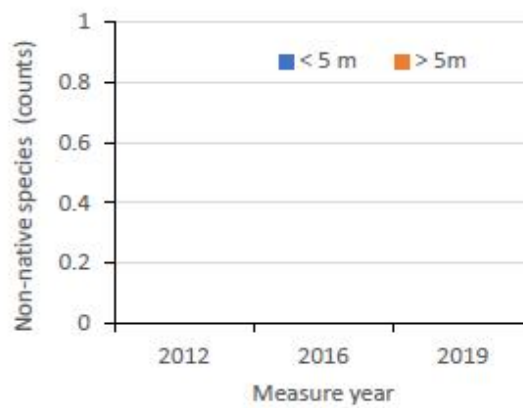


Trail-edge transect September 2016

Trail-edge transect September 2019

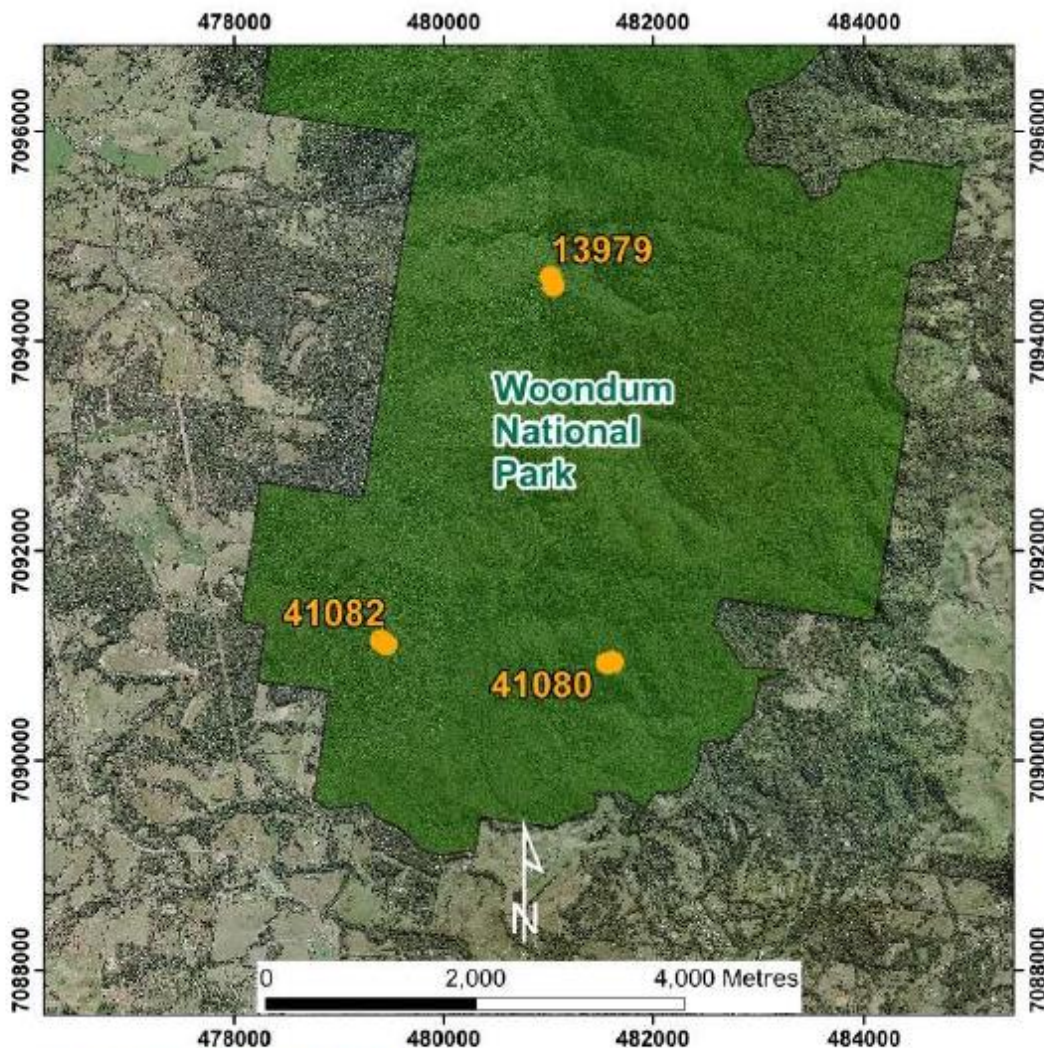


Non-native species cover



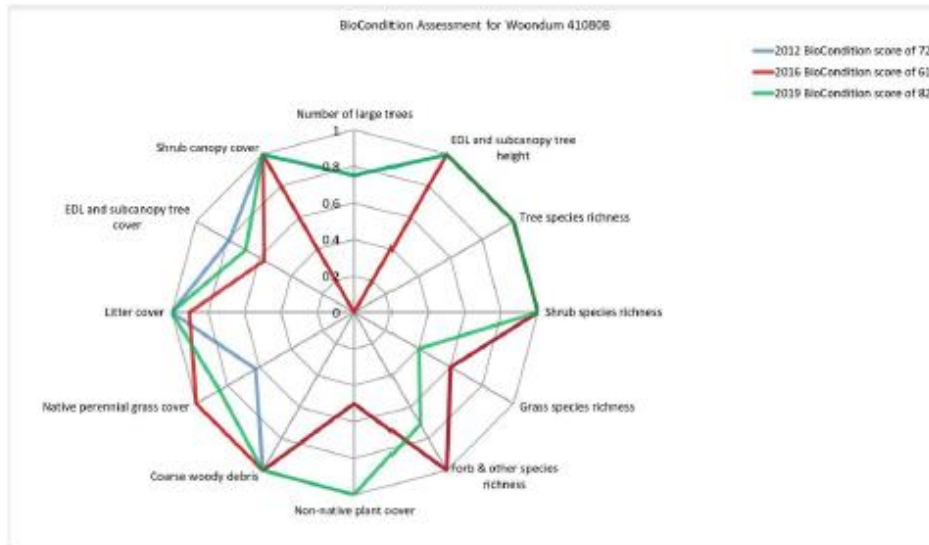
Number of non-native species

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



SEQ Monitoring Report Card
Woondum 41080B
Regional Ecosystem 12.12.15
Corymbia intermedia, Eucalyptus crebra, Eucalyptus siderophloia, Eucalyptus resinifera open forest
Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 72 2016 – 61 2019 – 82
 Fire History: Burnt August 2013



Forest monitoring transect September 2016 Forest monitoring transect September 2019

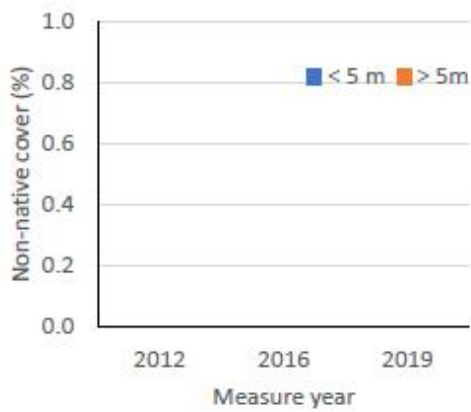
General Comments: This site consistently had a moderate BioCondition score which declined after the August 2013 fire, but recovered by 2019. Some trees had grown in girth to meet the large tree layer by 2019. The cover of *Lantana camara* cover also declined between the 2016 (12%) and 2019 sampling (4%).

Trail-edge ground cover transect at Woondum 41080B

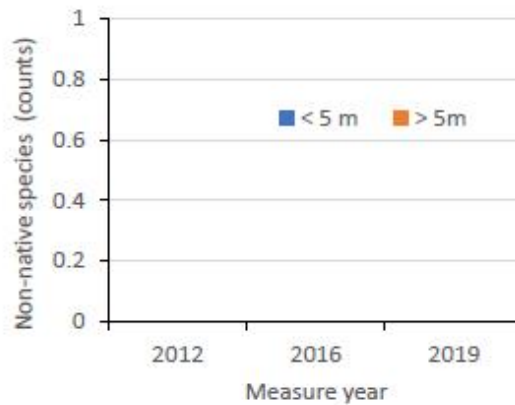


Trail-edge transect September 2016

Trail-edge transect September 2019

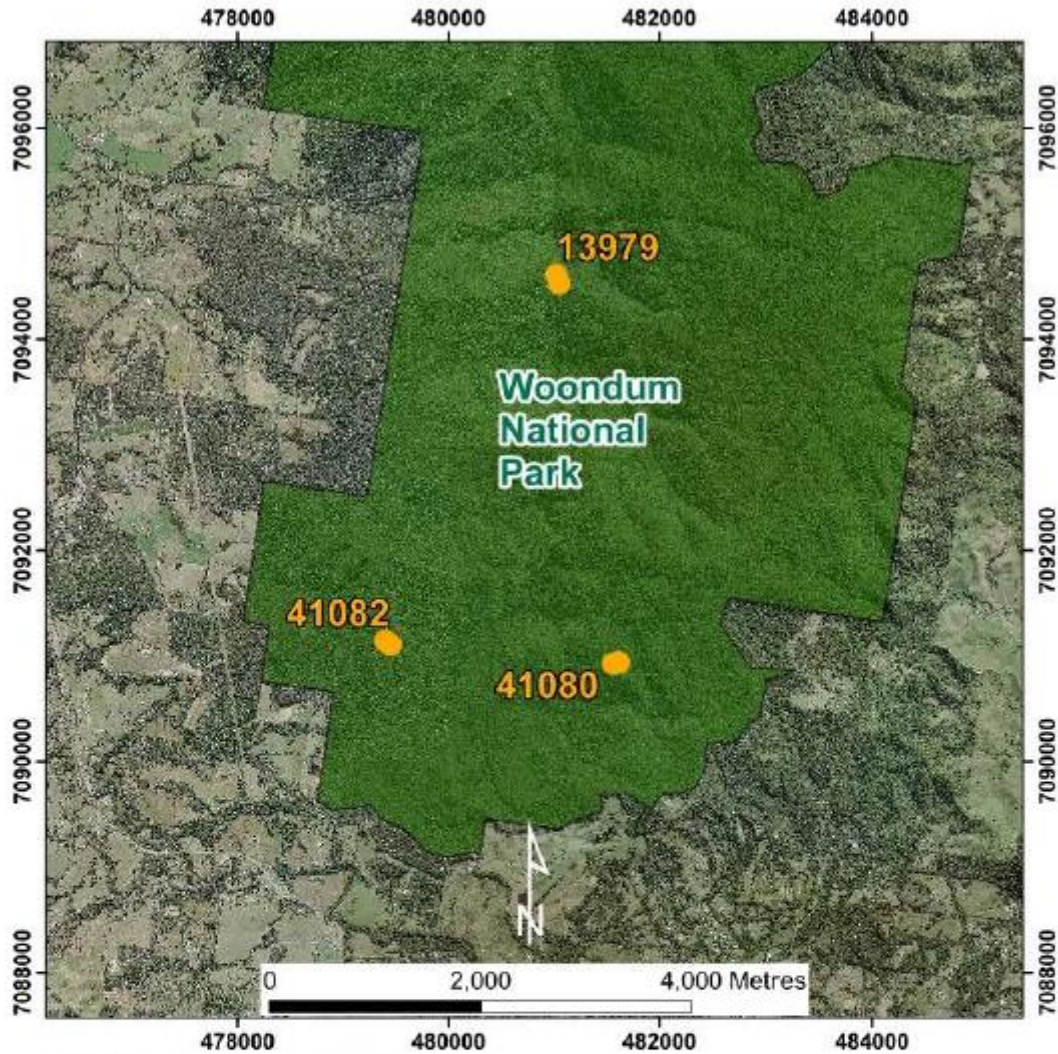


Non-native species cover



Number of non-native species

General comments: There were no non-native species recorded on the trail-edge transect. *Lantana camara* was the only non-native species present with only low (4 -12%) cover in the QBEIS site.



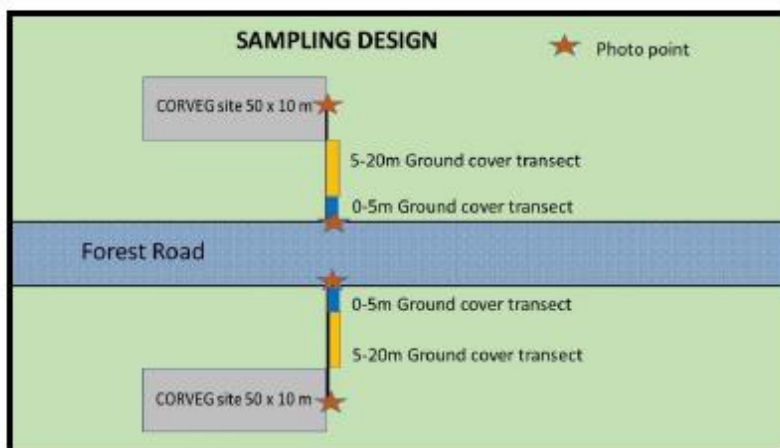
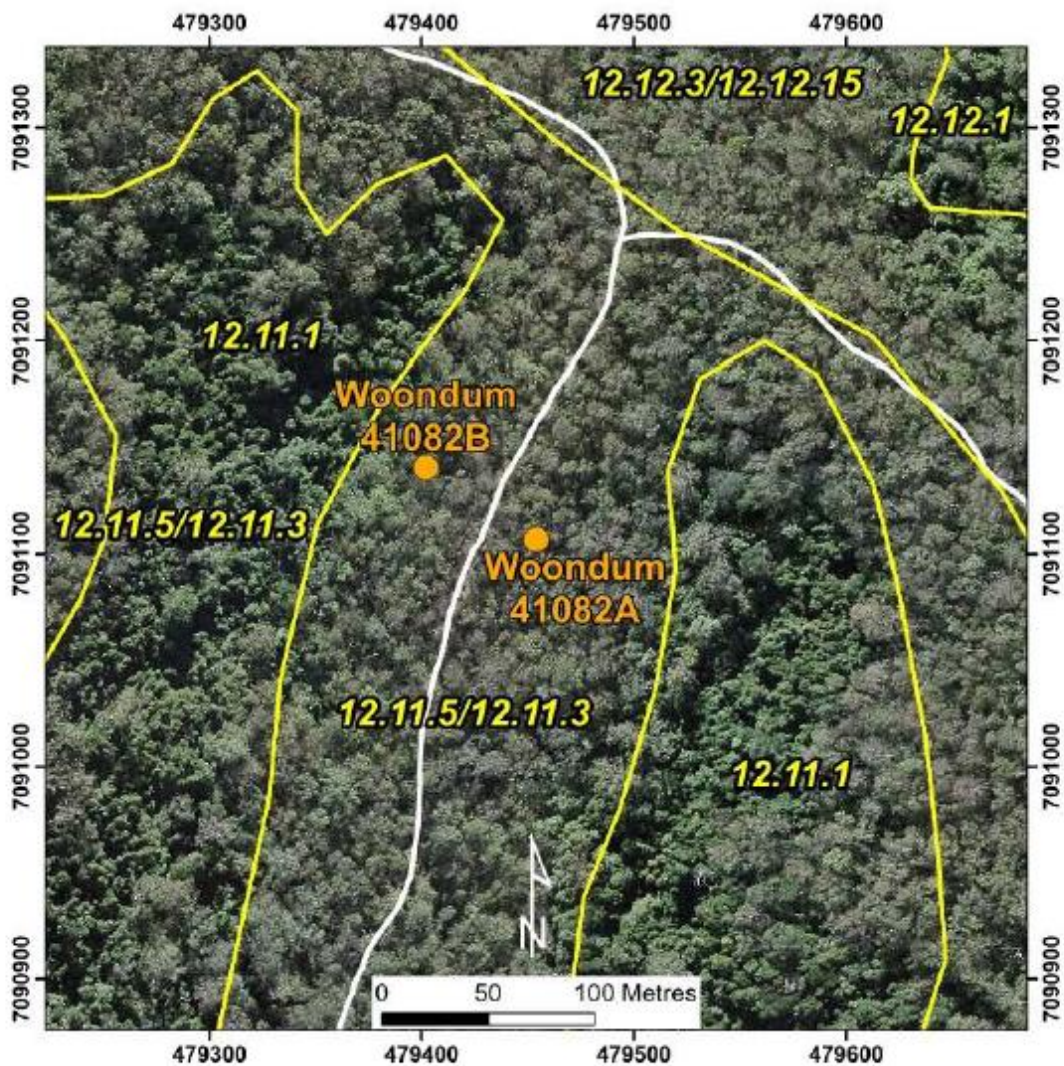
SEQ Monitoring Report Card

Woondum 41082A

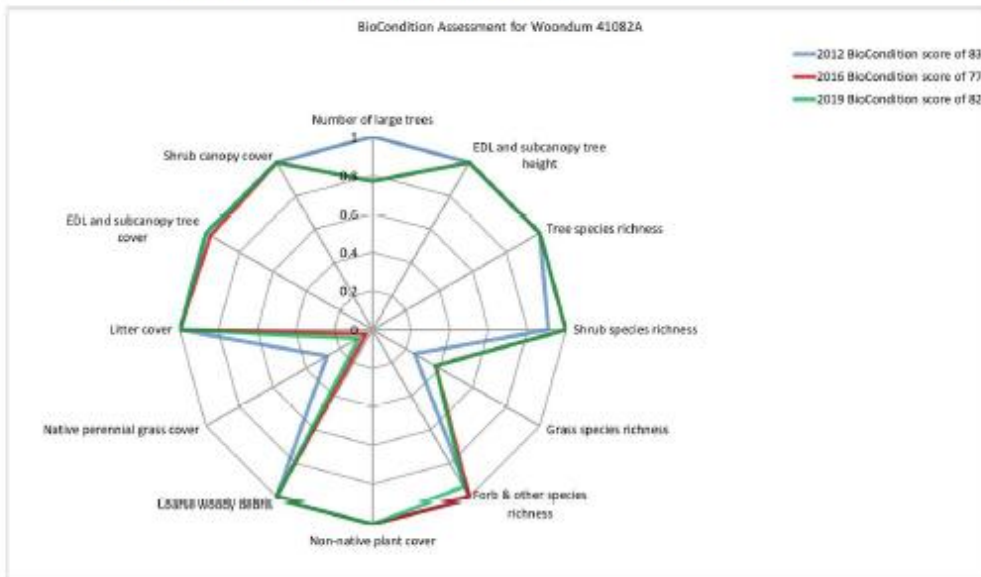
Regional Ecosystem 12.11.5

Eucalyptus acmenoides, *Corymbia citriodora* subsp. *variegata*, *Eucalyptus propinqua*, *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 – 83 2016 – 77 2019 – 82
 Fire History: No fire data



Forest monitoring transect September 2016 Forest monitoring transect September 2019

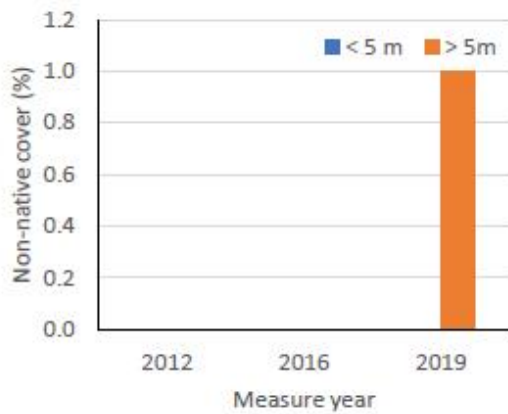
General Comments: This site consistently had a high BioCondition score. The perennial ground layer cover and grass species richness was consistently low compared to the benchmark.

Trail-edge ground cover transect at Woondum 41082A

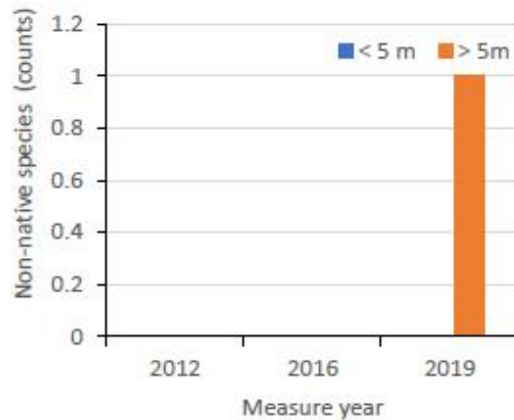


Trail-edge transect September 2016

Trail-edge transect September 2019

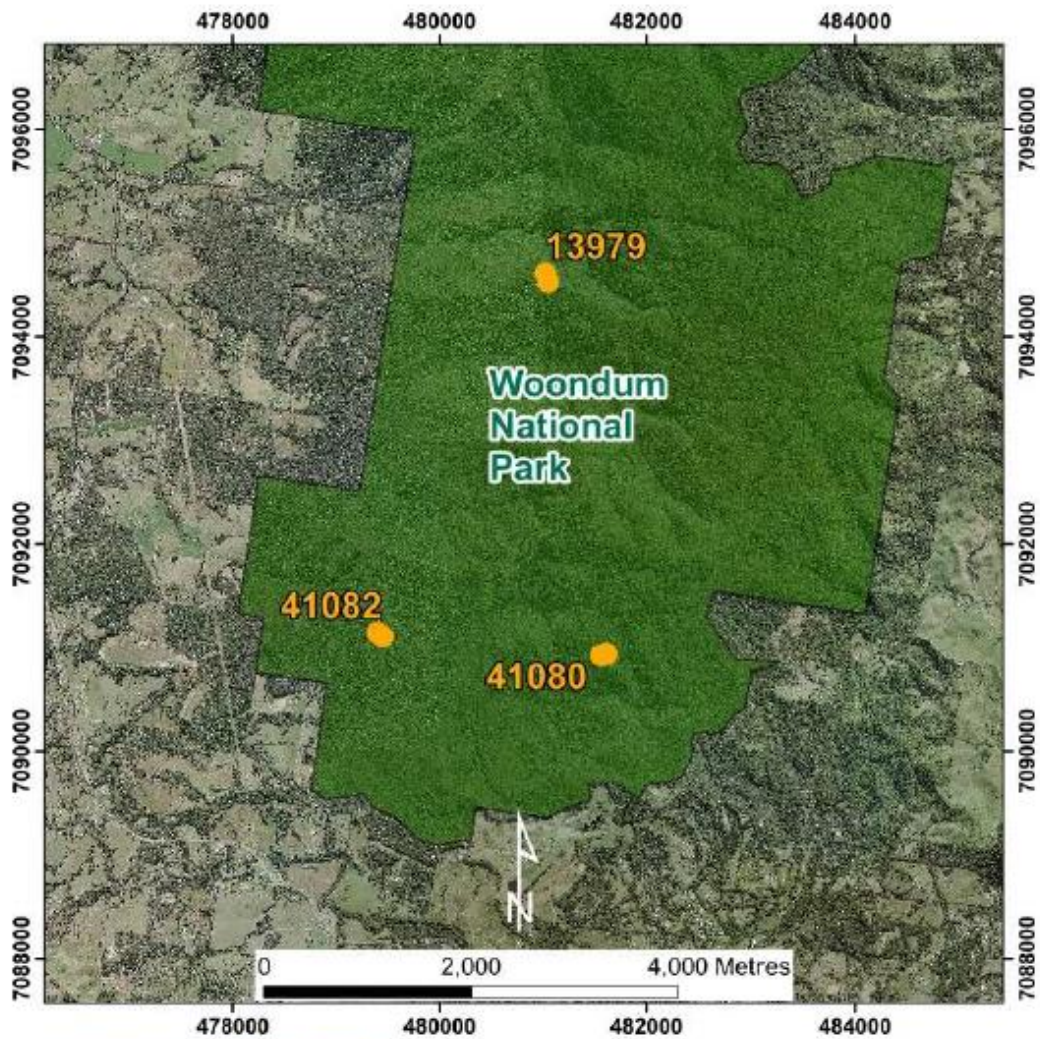


Non-native species cover



Number of non-native species

General comments: *Lantana camara* was the only non-native species recorded on the trail-edge transect and was only recorded in 2019. *L. camara* was the only non-native species present with only sparse cover in the QBEIS site.



SEQ Monitoring Report Card

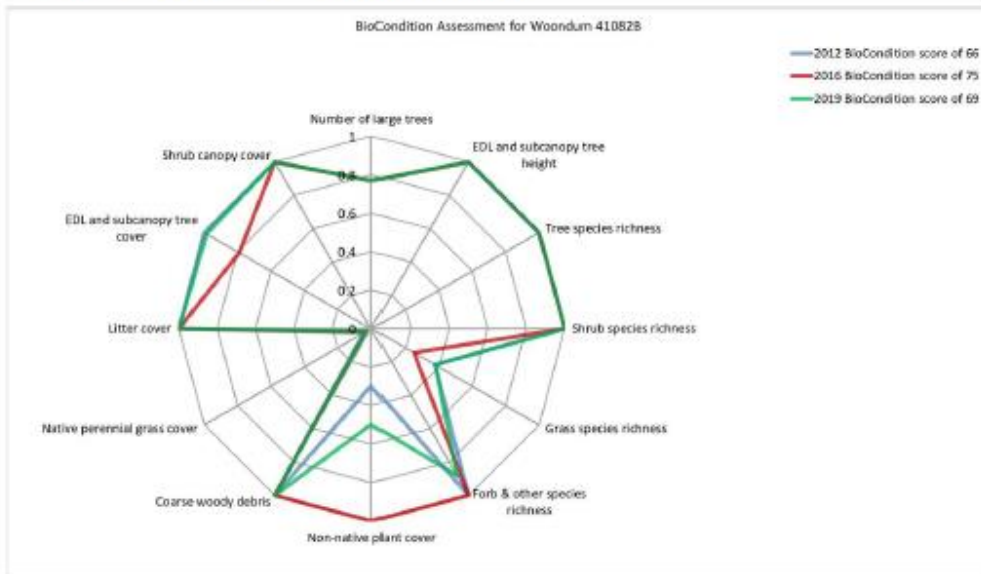
Woondum 41082B

Regional Ecosystem 12.11.5

Corymbia citriodora subsp. *variegata*,
Eucalyptus propinqua, *Eucalyptus*
acmenoides, *Eucalyptus siderophloia*
tall open forest

Queensland Herbarium, October 2021

QBEIS Site BioCondition monitoring



Radar diagram of BioCondition Scores by attribute and year sampled
 BioCondition scores: 2012 – 66 2016 – 75 2019 – 69
 Fire History: No fire data



Forest monitoring transect September 2016 Forest monitoring transect September 2019

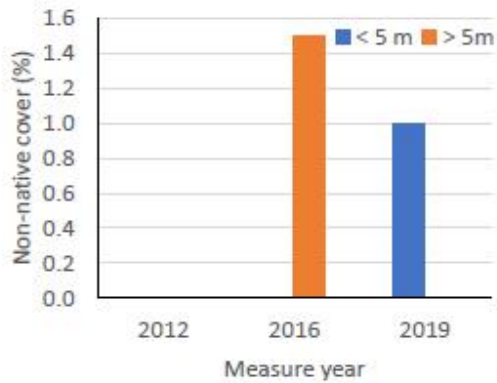
General Comments: This site had a varying moderate BioCondition scores. The perennial grass cover and grass richness was consistently low. The August 2013 fire reduced the cover of *Lantana camara* and increased the BioCondition score. The cover of *L. camara* cover had increased in 2019 but not to the 2013 cover.

Trail-edge ground cover transect at Woondum 41082B

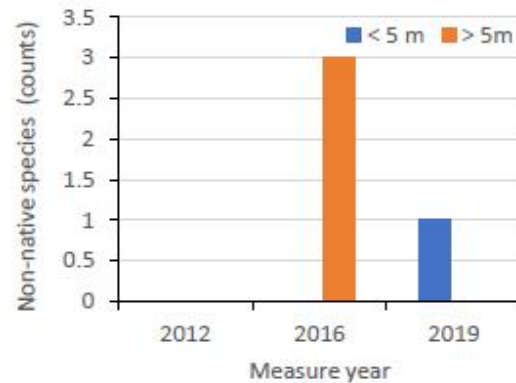


Trail-edge transect September 2016

Trail-edge transect September 2019



Non-native species cover



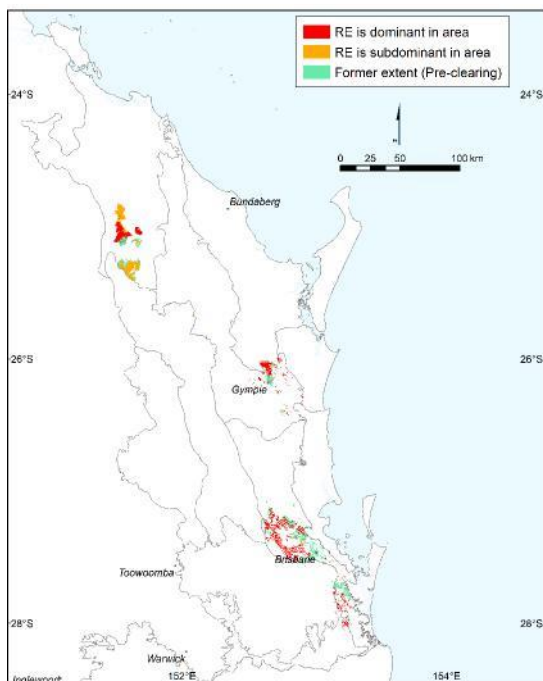
Number of non-native species

General comments: The only non-native species recorded at sparse cover on the trail-edge transect were *Lantana camara* and *Solanum seaforthianum*. *Lantana camara* was recorded in the QBEIS site with 30% cover in 2012, which reduced to only present in 2016, probably as a result of the August 2013 fire, and was 6% in 2019. *Solanum seaforthianum* was the only other non-native species recorded in the QBEIS site and only in 2016.

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.

12.11.5: *Corymbia citriodora* subsp. *variegata* woodland +/- *Eucalyptus siderophloia*/*E. crebra*, *E. carnea*, *E. acmenoides*, *E. propinqua* on metamorphics +/- interbedded volcanics



Mapping data	Pre-clearing area = 86,384.3 ha; Remnant area 2019 = 52,557.3 ha; Remnant percent remaining in 2019 = 60.8 %
Species richness	total: 375 (44 sites); woody: 146 (44 sites); ground: 287 (44 sites); average spp./site: 43.8, standard deviation: 11.8 (44 sites)
Basal area	average/site: 20.5 m ² /ha; range: 11.0 - 34.5 m ² /ha; std. deviation: 4.7; (44 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 22.43m; range: 12.73 - 33.70m; (44 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 56.6%; range: 20.0 - 92.6%; (44 sites)
Structural formation	Open Forest: 77.3 %; Woodland: 22.7 %; (44 sites)
Representative site(s)	1985, 2339, 2425, 2668, 3365, 4033, 4485, 4591, 6426, 6661, 6662, 8335, 8336, 13024, 13559, 13567, 13574, 13706, 13721, 14528, 15278, 15312, 16239, 17041, 17044, 17045, 17046, 17087, 17132, 17133, 17227, 17275, 17548, 17556, 17621, 17622, 17730, 17763, 17932, 18002, 18034, 18036, 18037, 18039

Stratum: Tree 1 (EDL)

Height: average: 22.43m; range: 12.73 - 33.70m; (44 sites)

Crown Cover: average: 56.6%; range: 20.0 - 92.6%; (44 sites)

Stem Count: average: 237 stems/ha; range: 40 - 640 stems/ha; std. deviation: 134.9 stems/ha; (43 sites)

Basal area: average: 16.0 m²/ha; range: 4.0 - 31.5 m²/ha; std. deviation: 5.0 m²/ha; (44 sites)

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

Most frequent species (up to 6):

Corymbia citriodora subsp. *variegata* (97.7, 34.5), *Eucalyptus crebra* (63.6, 14.5), *Eucalyptus carnea* (47.7, 8.7), *Eucalyptus propinqua* (34.1, 10.5), *Eucalyptus tereticornis* (25.0, 3.4), *Eucalyptus microcorys* (20.5, 15.8)

Additional species:

Eucalyptus siderophloia (18.2, 9.0), *Eucalyptus acmenoides* (15.9, 13.7), *Corymbia intermedia* (15.9, 9.3), *Eucalyptus major* (15.9, 6.8), *Eucalyptus helidonica* (9.1, 9.9), *Angophora leiocarpa* (6.8, 3.0), *Eucalyptus fibrosa* subsp. *fibrosa* (6.8, 2.2), *Corymbia tessellaris* (4.5, 3.0), *Corymbia trachyphloia* subsp. *trachyphloia* (2.3, 15.0), *Eucalyptus longirostrata* (2.3, 14.0), *Eucalyptus tindaliae* (2.3, 12.0), *Brachychiton populneus* subsp. *trilobus* (2.3, 3.0), *Lophostemon confertus* (2.3, 1.0), *Eucalyptus grandis* (2.3, 0.0)

Stratum: Tree 2

Height: average: 11.13m; range: 6.00 - 19.00m; (42 sites)

Crown Cover: average: 17.4%; range: 3.0 - 68.4%; (42 sites)

Stem Count: average: 314 stems/ha; range: 30 - 1,040 stems/ha; std. deviation: 180.8 stems/ha; (41 sites)

Basal area: average: 4.4 m²/ha; range: 0.5 - 12.0 m²/ha; std. deviation: 2.4 m²/ha; (40 sites)

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

Most frequent species (up to 6):

Corymbia citriodora subsp. *variegata* (72.7, 7.7), *Eucalyptus crebra* (54.5, 7.8), *Eucalyptus carnea* (54.5, 4.6), *Lophostemon confertus* (38.6, 3.6), *Corymbia intermedia* (36.4, 2.8), *Eucalyptus microcorys* (25.0, 7.7)

Additional species:

Eucalyptus propinqua (20.5, 5.8), *Allocasuarina torulosa* (20.5, 1.7), *Acacia disparrima* subsp. *disparrima* (20.5, 1.5), *Eucalyptus major* (18.2, 12.3), *Eucalyptus tereticornis* (18.2, 4.2), *Eucalyptus helidonica* (18.2, 3.6), *Eucalyptus siderophloia* (9.1, 1.0), *Angophora leiocarpa* (6.8, 2.5), *Eucalyptus acmenoides* (6.8, 2.5), *Acacia implexa* (4.5, 9.4), *Acacia maidenii* (4.5, 6.1), *Alphitonia excelsa* (4.5, 5.0), *Acacia concurrens* (4.5, 3.5), *Eucalyptus tindaliae* (4.5, 1.5), *Brachychiton populneus* subsp. *trilobus* (2.3, 6.4), *Allocasuarina littoralis* (2.3, 5.0), *Lophostemon suaveolens* (2.3, 2.0), *Corymbia henryi* (2.3, 1.0), *Eucalyptus exserta* (2.3, 1.0), *Eucalyptus longirostrata* (2.3, 1.0), *Huberantha nitidissima* (2.3, 1.0), *Jagera pseudorhus* var. *pseudorhus* (2.3, 1.0), *Acacia longissima* (2.3, 0.0), *Amyema conspicua* subsp. *conspicua* (2.3, 0.0), *Cryptocarya glaucescens* (2.3, 0.0), *Daviesia arborea* (2.3, 0.0), *Drypetes deplanchei* (2.3, 0.0), *Eucalyptus grandis* (2.3, 0.0), *Flindersia schottiana* (2.3, 0.0), *Lophostemon confertus* x *Lophostemon grandiflorus* (2.3, 0.0)

Stratum: Tree 3

Height: average: 5.80m; range: 2.50 - 9.20m; (19 sites)

Crown Cover: average: 25.0%; range: 0.0 - 73.6%; (19 sites)

Stem Count: average: 2,213 stems/ha; range: 80 - 16,700 stems/ha; std. deviation: 4,254.4 stems/ha; (17 sites)

Basal area: average: 1.6 m²/ha; range: 1.0 - 4.0 m²/ha; std. deviation: 1.1 m²/ha; (8 sites)

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

Most frequent species (up to 6):

Corymbia citriodora subsp. *variegata* (31.8, 5.1), *Eucalyptus crebra* (25.0, 5.7), *Acacia fimbriata* (18.2, 20.6), *Acacia disparrima* subsp. *disparrima* (18.2, 6.7), *Eucalyptus carnea* (18.2, 1.8), *Allocasuarina torulosa* (13.6, 4.4)

Additional species:

Lophostemon confertus (11.4, 9.8), *Acacia maidenii* (11.4, 2.6), *Eucalyptus siderophloia* (9.1, 6.7), *Alphitonia excelsa* (9.1, 6.7), *Eucalyptus major* (9.1, 3.9), *Eucalyptus propinqua* (9.1, 2.8), *Guioa semiglauca* (6.8, 16.1), *Eucalyptus helidonica* (6.8, 2.6), *Eucalyptus microcorys* (6.8, 0.0), *Acacia podalyriifolia* (4.5, 8.5), *Acacia irrorata* subsp. *irrorata* (4.5, 5.2), *Brachychiton populneus* subsp. *trilobus* (4.5, 0.0), *Corymbia intermedia* (4.5, 0.0), *Jagera pseudorhus* var. *pseudorhus* (4.5, 0.0), *Mallotus philippensis* (4.5, 0.0), *Exocarpos cupressiformis* (2.3, 9.2), *Mallotus discolor* (2.3, 6.6), *Acacia leiocalyx* subsp. *leiocalyx* (2.3, 6.0), *Rhodosphaera rhodanthema* (2.3, 4.6), *Breynia oblongifolia* (2.3, 1.5), *Angophora leiocarpa* (2.3, 1.0), *Eucalyptus tereticornis* (2.3, 1.0), *Guioa acutifolia* (2.3, 0.2), *Acacia longissima* (2.3, 0.0), *Cryptocarya glaucescens* (2.3, 0.0), *Cyclophyllum coprosmoides* var. *coprosmoides* (2.3, 0.0), *Diospyros geminata* (2.3, 0.0), *Drypetes deplanchei* (2.3, 0.0), *Eucalyptus acmenoides* (2.3, 0.0), *Euroschinus falcatus* var. *falcatus* (2.3, 0.0), *Flindersia australis* (2.3, 0.0), *Lantana camara** (2.3, 0.0), *Melia azedarach* (2.3, 0.0), *Passiflora suberosa** (2.3, 0.0), *Rhodamnia rubescens* (2.3, 0.0), *Senna pendula* var. *glabrata** (2.3, 0.0), *Synoum glandulosum* subsp. *glandulosum* (2.3, 0.0), *Trochocarpa laurina* (2.3, 0.0)

Stratum: Shrub 1

Height: average: 1.77m; range: 0.80 - 3.00m; (44 sites)

Crown Cover: average: 13.9%; range: 0.0 - 86.0%; (44 sites)

Stem Count: average: 1,880 stems/ha; range: 20 - 22,400 stems/ha; std. deviation: 3,670.0 stems/ha; (40 sites)

Basal area: average: 1.8 m²/ha; range: 1.0 - 2.0 m²/ha; std. deviation: 0.5 m²/ha; (4 sites)

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

Most frequent species (up to 6):

Alphitonia excelsa (63.6, 1.1), *Corymbia citriodora* subsp. *variegata* (61.4, 2.4), *Acacia disparrima* subsp. *disparrima* (59.1, 1.7), *Lantana camara** (56.8, 9.8), *Lophostemon confertus* (56.8, 2.1), *Eucalyptus crebra* (40.9, 1.4)

Additional species:

Acacia fimbriata (36.4, 15.8), *Acacia maidenii* (36.4, 0.6), *Acacia leiocalyx* subsp. *leiocalyx* (34.1, 2.9), *Allocasuarina torulosa* (29.5, 4.7), *Acacia falcata* (29.5, 1.7), *Eucalyptus carnea* (29.5, 1.1), *Persoonia sericea* (27.3, 0.9), *Jacksonia scoparia* (27.3, 0.9), *Breyenia oblongifolia* (22.7, 0.0), *Acrotriche aggregata* (20.5, 3.0), *Smilax australis* (20.5, 1.2), *Psychotria loniceroides* (18.2, 1.1), *Corymbia intermedia* (18.2, 0.2), *Eucalyptus propinqua* (13.6, 2.0), *Eucalyptus microcorys* (13.6, 1.2), *Eucalyptus tereticornis* (13.6, 1.0), *Cyclophyllum coprosmoides* var. *coprosmoides* (13.6, 0.2), *Dodonaea triquetra* (11.4, 3.2), *Indigofera australis* (11.4, 1.0), *Styphelia sieberi* (11.4, 1.0), *Jagera pseudorhus* var. *pseudorhus* (11.4, 0.4), *Wikstroemia indica* (11.4, 0.0), *Eucalyptus acmenoides* (9.1, 4.0), *Acacia irrorata* subsp. *irrorata* (9.1, 2.7), *Acacia concurrens* (9.1, 2.5), *Eucalyptus siderophloia* (9.1, 1.4), *Acacia longissima* (9.1, 1.0), *Angophora leiocarpa* (9.1, 1.0), *Brachychiton populneus* subsp. *trilobus* (9.1, 0.0), *Hibbertia linearis* var. *obtusifolia* (9.1, 0.0), *Pittosporum revolutum* (9.1, 0.0), *Acacia podalyriifolia* (6.8, 7.1), *Guioa semiglaucula* (6.8, 6.0), *Ochna serrulata** (6.8, 5.6), *Eucalyptus major* (6.8, 1.2), *Carissa ovata* (6.8, 1.0), *Acacia penninervis* var. *longiracemosa* (6.8, 0.6), *Clerodendrum floribundum* (6.8, 0.5), *Euroschinus falcatus* var. *falcatus* (6.8, 0.0), *Flindersia schottiana* (6.8, 0.0), *Melia azedarach* (6.8, 0.0), *Psychotria daphnoides* (6.8, 0.0), *Hovea acutifolia* (4.5, 4.2), *Cryptocarya glaucescens* (4.5, 2.4), *Ptiliostigma rhytispermum* (4.5, 2.4), *Podolobium ilicifolium* (4.5, 1.4), *Denhamia silvestris* (4.5, 1.0), *Eucalyptus tindaliae* (4.5, 1.0), *Ficus opposita* (4.5, 1.0), *Mallotus philippensis* (4.5, 1.0), *Trema tomentosa* var. *aspera* (4.5, 1.0), *Polyscias elegans* (4.5, 0.2), *Acacia melanoxylon* (4.5, 0.0), *Astrotricha latifolia* (4.5, 0.0), *Cissus antarctica* (4.5, 0.0), *Daviesia ulicifolia* (4.5, 0.0), *Denhamia celastroides* (4.5, 0.0), *Diospyros geminata* (4.5, 0.0), *Eucalyptus helidonica* (4.5, 0.0), *Flindersia australis* (4.5, 0.0), *Monotoca scoparia* (4.5, 0.0), *Secamone elliptica* (4.5, 0.0), *Senna pendula* var. *glabrata** (4.5, 0.0), *Pultenaea villosa* (2.3, 5.0), *Lophostemon suaveolens* (2.3, 3.0), *Mallotus discolor* (2.3, 2.6), *Cassinia subtropica* (2.3, 2.0), *Zieria smithii* (2.3, 2.0), *Denhamia cunninghamii* (2.3, 1.2), *Allocasuarina littoralis* (2.3, 1.0), *Bridelia leichhardtii* (2.3, 1.0), *Eucalyptus longirostrata* (2.3, 1.0), *Jasminum didymum* (2.3, 1.0), *Lophostemon confertus* x *Lophostemon grandiflorus* (2.3, 1.0), *Persoonia media* (2.3, 1.0), *Zieria minutiflora* subsp. *minutiflora* (2.3, 1.0), *Opuntia* (2.3, 0.5), *Daviesia villifera* (2.3, 0.2), *Acacia* (2.3, 0.0), *Acacia implexa* (2.3, 0.0), *Acacia penninervis* (2.3, 0.0), *Acronychia laevis* (2.3, 0.0), *Acronychia pauciflora* (2.3, 0.0), *Alectryon connatus* (2.3, 0.0), *Alpinia caerulea* (2.3, 0.0), *Alyxia ilicifolia* (2.3, 0.0), *Alyxia ruscifolia* (2.3, 0.0), *Asparagus aethiopicus** (2.3, 0.0), *Austrosteenisia blackii* var. *blackii* (2.3, 0.0), *Cassinia laevis* subsp. *rosmarinifolia* (2.3, 0.0), *Chorizema parviflorum* (2.3, 0.0), *Clematicissus opaca* (2.3, 0.0), *Corymbia tessellaris* (2.3, 0.0), *Cryptocarya triplinervis* (2.3, 0.0), *Cupaniopsis anacardioides* (2.3, 0.0), *Cupaniopsis serrata* (2.3, 0.0), *Daviesia arborea* (2.3, 0.0), *Dioscorea transversa* (2.3, 0.0), *Diospyros pentamera* (2.3, 0.0), *Drypetes deplanchei* (2.3, 0.0), *Elaeocarpus obovatus* (2.3, 0.0), *Eucalyptus* (2.3, 0.0), *Eucalyptus fibrosa* subsp. *fibrosa* (2.3, 0.0), *Eucalyptus seeana* (2.3, 0.0), *Eustrephus latifolius* (2.3, 0.0), *Exocarpos latifolius* (2.3, 0.0), *Ficus benjamina* (2.3, 0.0), *Ficus rubiginosa* (2.3, 0.0), *Geitonoplesium cymosum* (2.3, 0.0), *Glochidion ferdinandi* var. *ferdinandi* (2.3, 0.0), *Gomphocarpus physocarpus** (2.3, 0.0), *Guioa acutifolia* (2.3, 0.0), *Hardenbergia violacea* (2.3, 0.0), *Lespedeza juncea* subsp. *sericea* (2.3, 0.0), *Livistona australis* (2.3, 0.0), *Malva sylvestris** (2.3, 0.0), *Murraya paniculata* 'Exotica'* (2.3, 0.0), *Myoporum acuminatum* (2.3, 0.0), *Myrsine variabilis* (2.3, 0.0), *Olea paniculata* (2.3, 0.0), *Opuntia tomentosa** (2.3, 0.0), *Parsonsia straminea* (2.3, 0.0), *Passiflora subpeltata** (2.3, 0.0), *Petalostigma triloculare* (2.3, 0.0), *Planchonella australis* (2.3, 0.0), *Psydrax odorata* (2.3, 0.0), *Rhodospaera rhodanthema* (2.3, 0.0), *Synoum glandulosum* subsp. *glandulosum* (2.3, 0.0), *Tecoma stans* var. *stans** (2.3, 0.0), *Trochocarpa laurina* (2.3, 0.0), *Turraea pubescens* (2.3, 0.0)

Stratum: Shrub 2

Height: average: 0.80m; range: 0.80 - 0.80m; (3 sites)

Crown Cover: average: 4.2%; range: 2.0 - 5.5%; (3 sites)

Stem Count: average: 520 stems/ha; range: 120 - 880 stems/ha; std. deviation: 381.6 stems/ha; (3 sites)

Basal area: No data available.

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

Most frequent species (up to 6):

Alphitonia excelsa (6.8, 0.5), *Lophostemon confertus* (4.5, 1.2), *Acrotriche aggregata* (4.5, 0.3), *Acacia maidenii* (2.3, 1.0), *Persoonia sericea* (2.3, 1.0), *Acacia leiocalyx* subsp. *leiocalyx* (2.3, 0.6)

Additional species:

Allocasuarina torulosa (2.3, 0.5), *Corymbia citriodora* subsp. *variegata* (2.3, 0.5), *Denhamia silvestris* (2.3, 0.5), *Eucalyptus carnea* (2.3, 0.5), *Eucalyptus crebra* (2.3, 0.5), *Eucalyptus major* (2.3, 0.5), *Eucalyptus microcorys* (2.3, 0.5), *Lantana camara** (2.3, 0.5), *Psychotria loniceroides* (2.3, 0.5), *Acacia concurrens* (2.3, 0.2), *Breynia oblongifolia* (2.3, 0.2), *Cyclophyllum coprosmoides* var. *coprosmoides* (2.3, 0.2), *Eucalyptus tereticornis* (2.3, 0.2), *Acacia disparrima* subsp. *disparrima* (2.3, 0.0)

Stratum: Ground

Height: average: 0.55m; range: 0.30 - 0.80m; (44 sites)

Projective foliage cover (PFC): average: 33.6%; range: 7.4 - 60.4%; (44 sites)

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

Grass - perennial:

Most frequent species (up to 6):

Themeda triandra (84.1, 17.2), *Imperata cylindrica* (77.3, 4.9), *Cymbopogon refractus* (63.6, 4.6), *Entolasia stricta* (56.8, 1.7), *Arundinella nepalensis* (52.3, 7.9), *Eremochloa bimaculata* (38.6, 5.3)

Additional species:

Panicum effusum (34.1, 0.6), *Digitaria parviflora* (29.5, 2.5), *Melinis repens** (29.5, 0.9), *Capillipedium spicigerum* (25.0, 2.0), *Oplismenus aemulus* (22.7, 0.7), *Aristida queenslandica* var. *queenslandica* (20.5, 1.3), *Paspalidium distans* (15.9, 0.5), *Aristida calycina* var. *calycina* (13.6, 2.0), *Panicum simile* (13.6, 1.0), *Paspalidium gracile* (13.6, 0.2), *Alloteropsis semialata* (11.4, 2.0), *Dichelachne micrantha* (11.4, 0.0), *Ottochloa gracillima* (11.4, 0.6), *Aristida gracilipes* (9.1, 15.3), *Capillipedium parviflorum* (9.1, 3.0), *Chrysopogon sylvaticus* (9.1, 3.0), *Eragrostis spartinoides* (9.1, 0.0), *Microlaena stipoides* (9.1, 0.8), *Aristida vagans* (6.8, 0.2), *Eragrostis* (6.8, 0.0), *Heteropogon contortus* (6.8, 0.8), *Megathyrsus maximus** (6.8, 0.0), *Melinis minutiflora** (6.8, 0.0), *Paspalidium gausum* (6.8, 3.0), *Bothriochloa decipiens* (4.5, 0.0), *Chloris divaricata* (4.5, 1.0), *Digitaria* (4.5, 0.0), *Digitaria minima* (4.5, 0.6), *Oplismenus imbecillis* (4.5, 0.0), *Sporobolus creber* (4.5, 0.0), *Aristida benthamii* (2.3, 1.0), *Aristida warburgii* (2.3, 0.0), *Cenchrus calculatus* (2.3, 0.0), *Digitaria ramularis* (2.3, 1.0), *Eragrostis brownii* (2.3, 0.0), *Eragrostis lacunaria* (2.3, 0.0), *Leptochloa* (2.3, 0.0), *Poa labillardierei* var. *labillardierei* (2.3, 0.5), *Poa sieberiana* (2.3, 0.0), *Rytidosperma* (2.3, 0.2), *Urochloa decumbens** (2.3, 1.0)

Grass - annual/biennial:

Not present

Forbs & other:

Most frequent species (up to 6):

Desmodium rhytidophyllum (90.9, 2.8), *Cyanthillium cinereum* (79.5, 0.5), *Eustrephus latifolius* (79.5, 0.7), *Hardenbergia violacea* (59.1, 1.2), *Eremophila debilis* (54.5, 0.2), *Lomandra longifolia* (47.7, 1.4)

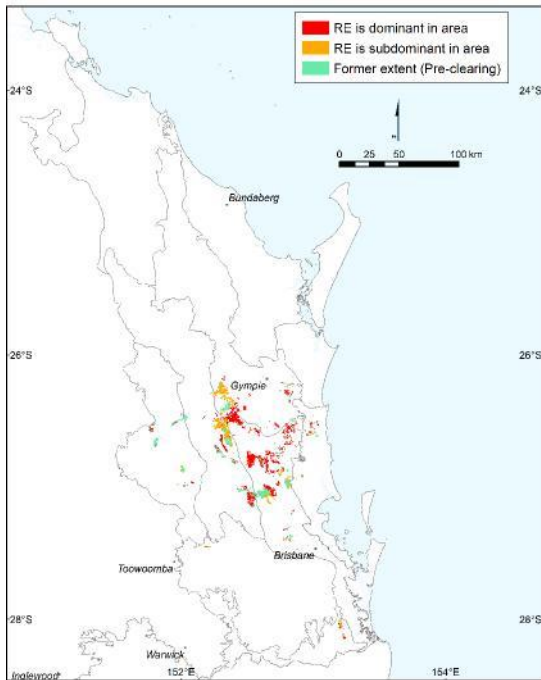
Additional species:

Glycine clandestina var. *clandestina* (45.5, 0.3), *Dianella longifolia* (40.9, 1.5), *Glycine tabacina* (38.6, 1.5), *Goodenia rotundifolia* (38.6, 0.4), *Lomandra laxa* (38.6, 1.9), *Phyllanthus virgatus* (38.6, 0.0), *Bidens pilosa** (36.4, 0.4), *Lomandra confertifolia* subsp. *pallida* (36.4, 2.3), *Lomandra multiflora* subsp. *multiflora* (36.4, 0.6), *Clematicissus opaca* (34.1, 0.2), *Cheilanthes sieberi* subsp. *sieberi* (31.8, 0.0), *Causonia clematidea* (29.5, 1.2), *Dianella caerulea* (29.5, 4.4), *Passiflora suberosa** (29.5, 0.6), *Smilax australis* (29.5, 0.7), *Brunoniella australis* (27.3, 0.0), *Crotalaria montana* (27.3, 0.2), *Desmodium brachypodum* (27.3, 6.0), *Lobelia purpurascens* (27.3, 0.8), *Scleria mackaviensis* (27.3, 0.5), *Pigea stellarioides* (25.0, 0.2), *Desmodium gunnii* (22.7, 0.0), *Galactia tenuiflora* (20.5, 0.8), *Lepidosperma laterale* var. *laterale** (20.5, 0.5), *Cassytha pubescens* (18.2, 0.2), *Coleus australis* (18.2, 0.6), *Passiflora subpeltata** (18.2, 0.5), *Sigesbeckia orientalis* (18.2, 0.2), *Chamaecrista nomame* (15.9, 0.4), *Dianella caerulea* var. *vannata* (15.9, 0.4), *Drynaria rigidula* (15.9, 0.3), *Glossocardia bidens* (15.9, 0.0), *Gomphocarpus physocarpus** (15.9, 0.0), *Hibbertia linearis* var. *obtusifolia* (15.9, 0.2), *Adiantum hispidulum* var. *hispidulum* (13.6, 0.0), *Commelina lanceolata* (13.6, 0.2), *Cyperus gracilis* (13.6, 1.1), *Lantana camara** (13.6, 0.5), *Tephrosia filipes* subsp. *filipes* (13.6, 0.2), *Alphitonia excelsa* (11.4, 0.5), *Apowollastonia spilanthis* (11.4, 0.0), *Erigeron sumatrensis** (11.4, 0.6), *Iphigenia indica* (11.4, 0.0), *Lantana montevidensis** (11.4, 2.3), *Opercularia diphylla* (11.4, 0.0), *Pseuderanthemum variabile* (11.4, 0.0), *Sonchus oleraceus** (11.4, 0.2), *Stephania japonica* var. *discolor* (11.4, 0.0), *Zornia dyctiocarpa* var. *dyctiocarpa* (11.4, 0.2), *Aeschynomene brevifolia* (9.1, 1.1), *Aristolochia meridionalis* subsp. *meridionalis* (9.1, 0.5), *Cassytha filiformis* (9.1, 0.5), *Centratherum riparium* (9.1, 0.0), *Corymbia citriodora* subsp. *variegata* (9.1, 1.4), *Lomandra filiformis* subsp. *filiformis* (9.1, 0.5), *Xanthorrhoea johnsonii* (9.1, 5.0), *Acacia disparrima* subsp. *disparrima* (6.8, 0.3), *Ageratum houstonianum** (6.8, 0.6), *Calotis dentex* (6.8, 0.2), *Carissa ovata* (6.8, 1.4), *Chrysocephalum apiculatum* (6.8, 0.0), *Eucalyptus crebra* (6.8, 0.2), *Ochna serrulata** (6.8, 5.0), *Oxalis chnoodes* (6.8, 0.2), *Oxalis comiculata** (6.8, 0.0), *Parsonia straminea* (6.8, 0.2), *Persoonia sericea* (6.8, 0.0), *Spermacoce brachystema* (6.8, 0.0), *Styphelia sieberi* (6.8, 0.2), *Anisomeles* (4.5, 0.0), *Asparagus aethiopicus** (4.5, 0.0), *Blechnum rupestre* (4.5, 0.5), *Breynia oblongifolia* (4.5, 0.0), *Cissus oblonga* (4.5, 0.0), *Commelina diffusa* (4.5, 0.2), *Commelina ensifolia* (4.5, 0.4), *Crassocephalum crepidioides** (4.5, 0.7), *Crotalaria lanceolata* subsp. *lanceolata** (4.5, 0.0), *Cyperus laevis* (4.5, 0.6), *Desmodium varians* (4.5, 0.2), *Emilia sonchifolia** (4.5, 0.0), *Erigeron bonariensis** (4.5, 0.0), *Eucalyptus major* (4.5, 0.0), *Eucalyptus microcorys* (4.5, 0.0), *Eucalyptus propinqua* (4.5, 0.0), *Flemingia parviflora* (4.5, 1.0), *Geitonoplesium cymosum* (4.5, 0.0), *Gomphocarpus fruticosus** (4.5, 0.0), *Grewia latifolia* (4.5, 0.0), *Guioa semiglaucula* (4.5, 0.3)

Hovea acutifolia (4.5, 0.6), *Indigofera hirsuta* (4.5, 0.0), *Ipomoea plebeia* (4.5, 0.0), *Lilium formosanum** (4.5, 0.0), *Murdannia graminea* (4.5, 0.0), *Poranthera microphylla* (4.5, 0.0), *Psychotria loniceroides* (4.5, 0.0), *Pyrrosia rupestris* (4.5, 0.0), *Rostellularia adscendens* (4.5, 0.6), *Solanum americanum** (4.5, 0.0), *Solanum stelligerum* (4.5, 0.0), *Xanthorrhoea latifolia* subsp. *latifolia* (4.5, 0.0), *Zornia dyctiocarpa* var. *filifolia* (4.5, 0.0), *Acacia* (2.3, 0.4), *Acacia fimbriata* (2.3, 0.2), *Acacia leiocalyx* subsp. *leiocalyx* (2.3, 0.2), *Acacia penninervis* var. *longiracemosa* (2.3, 0.0), *Acronychia pauciflora* (2.3, 0.4), *Acrotriche aggregata* (2.3, 0.0), *Ageratina riparia** (2.3, 0.0), *Ajuga australis* (2.3, 0.0), *Alectryon subdentatus* (2.3, 0.0), *Allocasuarina torulosa* (2.3, 0.0), *Angophora leiocarpa* (2.3, 0.0), *Apiaceae* (2.3, 0.0), *Artanema fimbriatum* (2.3, 0.0), *Asclepias curassavica** (2.3, 0.2), *Asparagus* (2.3, 0.0), *Asparagus racemosus* (2.3, 0.0), *Astrotricha latifolia* (2.3, 0.0), *Billardiera scandens* (2.3, 0.0), *Blechnum cartilagineum* (2.3, 0.2), *Blechnum doodianum* (2.3, 0.0), *Brachychiton populneus* subsp. *trilobus* (2.3, 0.0), *Centella asiatica* (2.3, 0.0), *Centratherum punctatum** (2.3, 0.0), *Chamaecrista mimosoides* (2.3, 0.0), *Cheilanthes distans* (2.3, 0.0), *Chorizema parviflorum* (2.3, 0.0), *Cirsium vulgare** (2.3, 0.0), *Cissus antarctica* (2.3, 0.0), *Cissus hypoglauca* (2.3, 0.0), *Clerodendrum tomentosum* (2.3, 0.0), *Corybas barbarae* (2.3, 0.0), *Corymbia intermedia* (2.3, 0.0), *Curculigo ensifolia* var. *ensifolia* (2.3, 0.0), *Cyclophyllum coprosmoides* var. *coprosmoides* (2.3, 0.2), *Cymbidium madidum* (2.3, 0.0), *Cyperus cyperoides* (2.3, 0.0), *Cyperus dactylotes* (2.3, 0.0), *Cyperus enervis* (2.3, 0.0), *Cyperus tetraphyllus* (2.3, 0.2), *Cyperus trinervis* (2.3, 0.0), *Daviesia ulicifolia* (2.3, 0.0), *Denhamia cunninghamii* (2.3, 1.4), *Denhamia silvestris* (2.3, 0.4), *Desmodium* (2.3, 1.6), *Desmodium gangeticum* (2.3, 0.0), *Desmodium triflorum** (2.3, 0.0), *Dianella brevipedunculata* (2.3, 0.0), *Dianella caerulea* var. *assera* (2.3, 0.0), *Dioscorea transversa* (2.3, 0.0), *Diospyros fasciculosa* (2.3, 0.2), *Dockrillia linguiformis* (2.3, 0.0), *Dodonaea triquetra* (2.3, 0.2), *Erigeron* (2.3, 0.0), *Eucalyptus* (2.3, 1.2), *Eucalyptus carnea* (2.3, 0.2), *Eucalyptus moluccana* (2.3, 0.0), *Evolvulus alsinoides* (2.3, 0.0), *Exocarpos strictus* (2.3, 0.0), *Ficus rubiginosa* (2.3, 0.0), *Fimbristylis cinnamometorum* (2.3, 0.0), *Fimbristylis dichotoma* (2.3, 0.0), *Flindersia australis* (2.3, 0.0), *Gahnia aspera* (2.3, 0.0), *Glycine* (2.3, 0.0), *Glycine cyrtoloba* (2.3, 0.6), *Glycine stenophita* (2.3, 1.2), *Glycine tomentella* (2.3, 0.0), *Gompholobium pinnatum* (2.3, 0.0), *Goodenia bellidifolia* subsp. *argentea* (2.3, 0.0), *Goodenia delicata* (2.3, 0.0), *Goodenia mystrophylla* (2.3, 0.0), *Gymnostachys anceps* (2.3, 0.0), *Hibbertia aspera* (2.3, 0.0), *Hibbertia linearis* (2.3, 0.0), *Hoya australis* (2.3, 0.0), *Hypericum gramineum* (2.3, 0.0), *Indigofera australis* (2.3, 0.0), *Jacksonia scoparia* (2.3, 0.0), *Jasminum didymum* (2.3, 1.0), *Kennedia rubicunda* (2.3, 0.0), *Lagenophora stipitata* (2.3, 0.0), *Laxmannia gracilis* (2.3, 0.0), *Macroptilium atropurpureum** (2.3, 0.0), *Macrotyloma axillare* var. *axillare** (2.3, 6.0), *Macrozamia miquelii* (2.3, 0.0), *Malvastrum coromandelianum* subsp. *coromandelianum** (2.3, 0.0), *Marsdenia* (2.3, 0.0), *Myrsine variabilis* (2.3, 0.0), *Neonotonia wightii* var. *wightii** (2.3, 0.0), *Olearia nemstii* (2.3, 0.0), *Oxalis* (2.3, 0.0), *Oxalis radicata* (2.3, 0.0), *Oxylobium* (2.3, 0.0), *Pandorea floribunda* (2.3, 0.0), *Pandorea pandorana* (2.3, 0.0), *Passiflora edulis** (2.3, 0.0), *Passiflora foetida** (2.3, 0.0), *Passiflora suberosa* subsp. *litoralis** (2.3, 0.5), *Pavetta australiensis* (2.3, 0.0), *Peripleura hispidula* var. *hispidula* (2.3, 0.0), *Peripleura hispidula* var. *setosa* (2.3, 0.0), *Persoonia* (2.3, 0.0), *Pimelea altior* (2.3, 0.0), *Podolobium ilicifolium* (2.3, 0.2), *Polymeria calycina* (2.3, 0.0), *Pseudohyphella verrucosa* (2.3, 0.0), *Pterocaulon redolens* (2.3, 0.0), *Rhynchosia minima* (2.3, 0.0), *Rhynchosia minima* var. *minima* (2.3, 0.0), *Rubus parvifolius* (2.3, 0.0), *Rutaceae* (2.3, 0.0), *Sarcopetalum harveyanum* (2.3, 0.0), *Scleria tricuspidata* (2.3, 0.0), *Secamone elliptica* (2.3, 0.0), *Sida* (2.3, 0.0), *Sida hackettiana* (2.3, 0.0), *Sida rhombifolia** (2.3, 0.0), *Solanum gympiense* (2.3, 0.0), *Solanum seafortianum** (2.3, 0.0), *Solori involuta* (2.3, 0.0), *Streblus brunonianus* (2.3, 0.0), *Tephrosia* (2.3, 0.0), *Thysanotus tuberosus* (2.3, 0.0), *Trochocarpa laurina* (2.3, 0.2), *Usnea** (2.3, 0.0), *Veronica plebeia* (2.3, 0.0), *Viola betonicifolia* (2.3, 0.0), *Vittadinia cuneata* var. *hirsuta* (2.3, 0.0), *Wahlenbergia capillaris* (2.3, 0.0), *Wikstroemia indica* (2.3, 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.

12.12.15: *Corymbia intermedia* +/- *Eucalyptus propinqua*, *E. siderophloia*, *E. microcorys*, *Lophostemon confertus* open forest on Mesozoic to Proterozoic igneous rocks



Mapping data	Pre-clearing area = 77,527.6 ha; Remnant area 2019 = 58,494.6 ha; Remnant percent remaining in 2019 = 75.4 %
Species richness	total: 333 (26 sites); woody: 136 (26 sites); ground: 263 (26 sites); average spp./site: 46.4, standard deviation: 13.5 (26 sites)
Basal area	average/site: 26.1 m ² /ha; range: 15.0 - 55.0 m ² /ha; std. deviation: 9.5; (26 sites)
Ecological dominant layer (EDL) height	stratum: tree 1; average/site: 24.87m; range: 18.00 - 31.00m; (26 sites)
Ecological dominant layer (EDL) Crown Cover	stratum: tree 1; average: 60.0%; range: 11.2 - 94.4%; (26 sites)
Structural formation	Open Forest: 53.8 %; Woodland: 26.9 %; Closed Forest: 11.5 %; Tall Open Forest: 7.7 %; (26 sites)
Representative site(s)	1983, 1987, 3087, 3091, 4116, 4461, 6174, 8508, 11815, 13233, 14004, 14994, 15166, 15681, 17213, 17225, 17228, 17318, 17319, 17320, 17333, 17376, 17415, 17475, 17995, 18401

Stratum: Tree 1 (EDL)

Height: average: 24.87m; range: 18.00 - 31.00m; (26 sites)

Crown Cover: average: 60.0%; range: 11.2 - 94.4%; (26 sites)

Stem Count: average: 263 stems/ha; range: 60 - 660 stems/ha; std. deviation: 163.9 stems/ha; (25 sites)

Basal area: average: 19.6 m²/ha; range: 5.0 - 45.0 m²/ha; std. deviation: 9.5 m²/ha; (26 sites)

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

Most frequent species (up to 6):

Corymbia intermedia (88.5, 12.1), *Lophostemon confertus* (61.5, 15.6), *Eucalyptus microcorys* (61.5, 13.8), *Eucalyptus propinqua* (53.8, 13.2), *Eucalyptus siderophloia* (50.0, 7.8), *Eucalyptus acmenoides* (42.3, 24.7)

Additional species:

Eucalyptus carnea (34.6, 15.0), *Eucalyptus tereticornis* (23.1, 8.0), *Eucalyptus resinifera* (15.4, 15.8), *Eucalyptus major* (11.5, 14.0), *Angophora subvelutina* (11.5, 9.5), *Corymbia trachyphloia* subsp. *trachyphloia* (7.7, 21.0), *Allocasuarina torulosa* (7.7, 6.5), *Eucalyptus crebra* (7.7, 6.2), *Lophostemon suaveolens* (7.7, 1.0), *Corymbia citriodora* subsp. *variegata* (3.8, 16.0), *Eucalyptus longirostrata* (3.8, 8.0), *Eucalyptus saligna* (3.8, 7.0), *Syncarpia verecunda* (3.8, 7.0), *Eucalyptus helidonica* (3.8, 3.0), *Angophora woodsiana* (3.8, 2.0), *Eucalyptus biturbinata* (3.8, 1.0), *Syncarpia glomulifera* subsp. *glomulifera* (3.8, 1.0), *Eucalyptus grandis* (3.8, 0.0)

Stratum: Tree 2

Height: average: 11.81m; range: 5.00 - 22.00m; (24 sites)

Crown Cover: average: 25.9%; range: 0.0 - 80.0%; (24 sites)

Stem Count: average: 525 stems/ha; range: 24 - 1,600 stems/ha; std. deviation: 381.4 stems/ha; (24 sites)

Basal area: average: 6.9 m²/ha; range: 1.0 - 13.0 m²/ha; std. deviation: 3.7 m²/ha; (22 sites)

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

Most frequent species (up to 6):

Corymbia intermedia (57.7, 4.2), *Lophostemon confertus* (53.8, 11.9), *Allocasuarina torulosa* (38.5, 7.5), *Eucalyptus microcorys* (30.8, 3.8), *Eucalyptus siderophloia* (23.1, 4.2), *Eucalyptus acmenoides* (23.1, 2.8)

Additional species:

Syncarpia glomulifera subsp. *glomulifera* (19.2, 5.5), *Eucalyptus propinqua* (19.2, 4.5), *Acacia disparrima* subsp. *disparrima* (19.2, 4.3), *Angophora subvelutina* (19.2, 4.3), *Eucalyptus tereticornis* (19.2, 4.0), *Lophostemon suaveolens* (15.4, 13.2), *Allocasuarina littoralis* (15.4, 7.5), *Acacia melanoxylon* (11.5, 15.0), *Melaleuca salicina* (11.5, 13.7), *Alphitonia excelsa* (11.5, 4.2), *Polyscias elegans* (11.5, 4.0), *Cryptocarya microneura* (7.7, 8.0), *Melaleuca quinquenervia* (7.7, 2.0), *Acacia maidenii* (7.7, 1.5), *Eucalyptus carnea* (7.7, 1.0), *Acacia penninervis* var. *penninervis* (3.8, 5.0), *Syncarpia verecunda* (3.8, 3.0), *Angophora woodsiana* (3.8, 2.0), *Corymbia trachyphloia* subsp. *trachyphloia* (3.8, 2.0), *Flindersia xanthoxyla* (3.8, 2.0), *Eucalyptus major* (3.8, 1.0), *Trochocarpa laurina* (3.8, 1.0), *Cryptocarya glaucescens* (3.8, 0.5), *Psydrax odorata* forma *australiana* (3.8, 0.5), *Synoum glandulosum* subsp. *glandulosum* (3.8, 0.5), *Zanthoxylum brachyacanthum* (3.8, 0.5), *Amyema congener* (3.8, 0.0), *Eucalyptus longirostrata* (3.8, 0.0), *Glochidion sumatranum* (3.8, 0.0), *Halfordia kendack* (3.8, 0.0), *Platycterium bifurcatum* (3.8, 0.0)

Stratum: Tree 3

Height: average: 5.95m; range: 3.00 - 8.00m; (10 sites)

Crown Cover: average: 23.6%; range: 6.0 - 66.6%; (10 sites)

Stem Count: average: 1,614 stems/ha; range: 180 - 4,760 stems/ha; std. deviation: 1,758.7 stems/ha; (10 sites)

Basal area: average: 3.2 m²/ha; range: 1.0 - 5.0 m²/ha; std. deviation: 1.8 m²/ha; (5 sites)

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

Most frequent species (up to 6):

Corymbia intermedia (26.9, 2.4), *Lophostemon confertus* (19.2, 4.0), *Acacia disparrima* subsp. *disparrima* (19.2, 3.3), *Alphitonia excelsa* (15.4, 9.2), *Eucalyptus siderophloia* (15.4, 0.0), *Euroschinus falcatus* var. *falcatus* (15.4, 0.0)

Additional species:

Allocasuarina torulosa (11.5, 5.5), *Lophostemon suaveolens* (11.5, 3.7), *Eucalyptus microcorys* (11.5, 3.0), *Polyscias elegans* (11.5, 0.5), *Glochidion ferdinandi* var. *ferdinandi* (7.7, 40.1), *Glochidion sumatranum* (7.7, 29.4), *Allocasuarina littoralis* (7.7, 6.7), *Acacia irrorata* subsp. *irrorata* (7.7, 4.4), *Halfordia kendack* (7.7, 3.6), *Acacia penninervis* var. *penninervis* (7.7, 1.0), *Guioa semiglaucula* (7.7, 0.5), *Acacia maidenii* (7.7, 0.0), *Acacia melanoxylon* (7.7, 0.0), *Eucalyptus acmenoides* (7.7, 0.0), *Lantana camara** (7.7, 0.0), *Eucalyptus propinqua* (3.8, 6.0), *Cryptocarya glaucescens* (3.8, 3.0), *Melaleuca salicina* (3.8, 3.0), *Corymbia citriodora* subsp. *variegata* (3.8, 2.0), *Eucalyptus major* (3.8, 1.0), *Melaleuca quinquenervia* (3.8, 1.0), *Acronychia laevis* (3.8, 0.0), *Clematicissus opaca* (3.8, 0.0), *Eucalyptus resinifera* (3.8, 0.0), *Eucalyptus tereticornis* (3.8, 0.0), *Ficus coronata* (3.8, 0.0), *Parsonsia straminea* (3.8, 0.0), *Syncarpia glomulifera* subsp. *glomulifera* (3.8, 0.0), *Trochocarpa laurina* (3.8, 0.0)

Stratum: Shrub 1

Height: average: 1.88m; range: 1.20 - 3.00m; (26 sites)

Crown Cover: average: 17.4%; range: 1.0 - 71.4%; (26 sites)

Stem Count: average: 2,235 stems/ha; range: 80 - 6,720 stems/ha; std. deviation: 1,916.3 stems/ha; (23 sites)

Basal area: average: 2.0 m²/ha; range: 2.0 - 2.0 m²/ha; std. deviation: 0.0 m²/ha; (1 site)

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

Most frequent species (up to 6):

Lophostemon confertus (76.9, 2.8), *Alphitonia excelsa* (61.5, 2.4), *Allocauarina torulosa* (46.2, 2.1), *Lantana camara** (38.5, 17.1), *Acacia disparrima* subsp. *disparrima* (38.5, 1.5), *Acacia maidenii* (38.5, 1.1)

Additional species:

Breynia oblongifolia (38.5, 1.0), *Polyscias elegans* (30.8, 3.0), *Corymbia intermedia* (30.8, 2.0), *Eucalyptus propinqua* (26.9, 6.6), *Acacia melanoxyloides* (26.9, 0.9), *Eucalyptus microcorys* (23.1, 7.0), *Glochidion ferdinandi* var. *ferdinandi* (23.1, 2.6), *Eucalyptus siderophloia* (23.1, 2.0), *Psychotria loniceroides* (19.2, 1.4), *Euroschinus falcatus* var. *falcatus* (19.2, 0.0), *Xanthorrhoea latifolia* subsp. *latifolia* (15.4, 10.7), *Eucalyptus acmenoides* (15.4, 4.1), *Astrotricha latifolia* (15.4, 3.0), *Hovea acutifolia* (15.4, 1.0), *Wikstroemia indica* (15.4, 0.2), *Psychotria daphnoides* (15.4, 0.0), *Platylobium formosum* (11.5, 28.3), *Clerodendrum floribundum* (11.5, 4.5), *Allocauarina littoralis* (11.5, 2.2), *Smilax australis* (11.5, 2.0), *Acacia irrorata* subsp. *irrorata* (11.5, 1.8), *Angophora subvelutina* (11.5, 1.0), *Jacksonia scoparia* (11.5, 0.8), *Eucalyptus carnea* (11.5, 0.0), *Guioa semiglaucula* (11.5, 0.0), *Ptilidostigma rhytispermum* (11.5, 0.0), *Denhamia silvestris* (7.7, 2.0), *Dioscorea transversa* (7.7, 2.0), *Persoonia sericea* (7.7, 2.0), *Trochocarpa laurina* (7.7, 1.8), *Banksia integrifolia* subsp. *compar* (7.7, 1.0), *Cissus antarctica* (7.7, 1.0), *Cordyline petiolaris* (7.7, 0.5), *Dodonaea triquetra* (7.7, 0.5), *Eupomatia laurina* (7.7, 0.5), *Glochidion sumatranum* (7.7, 0.5), *Jagera pseudorhus* var. *pseudorhus* (7.7, 0.5), *Notelaea longifolia* (7.7, 0.5), *Acrotriche aggregata* (7.7, 0.0), *Carissa ovata* (7.7, 0.0), *Celastrus subspicata* (7.7, 0.0), *Cryptocarya glaucescens* (7.7, 0.0), *Eucalyptus tereticornis* (7.7, 0.0), *Maclura cochinchinensis* (7.7, 0.0), *Mallotus philippensis* (7.7, 0.0), *Rhodamnia rubescens* (7.7, 0.0), *Tetrastigma nitens* (7.7, 0.0), *Zieria smithii* (7.7, 0.0), *Cassinia laevis* subsp. *rosmarinifolia* (3.8, 4.2), *Cassinia subtropica* (3.8, 3.0), *Daviesia villifera* (3.8, 3.0), *Corymbia citriodora* subsp. *variegata* (3.8, 2.0), *Acacia penninervis* var. *penninervis* (3.8, 1.5), *Acacia longissima* (3.8, 1.0), *Acacia oshanesii* (3.8, 1.0), *Corymbia trachyphloia* subsp. *trachyphloia* (3.8, 1.0), *Elaeocarpus reticulatus* (3.8, 1.0), *Melaleuca quinquenervia* (3.8, 1.0), *Pittosporum multiflorum* (3.8, 1.0), *Pultenaea retusa* (3.8, 1.0), *Acalypha nemorum* (3.8, 0.5), *Acronychia oblongifolia* (3.8, 0.5), *Dysoxylum* (3.8, 0.5), *Heptapleurum actinophyllum* (3.8, 0.5), *Ligustrum sinense** (3.8, 0.5), *Melastoma malabathricum* subsp. *malabathricum* (3.8, 0.5), *Pomaderris ferruginea* (3.8, 0.5), *Denhamia* (3.8, 0.2), *Myrsine variabilis* (3.8, 0.2), *Acacia disparrima* (3.8, 0.0), *Acronychia laevis* (3.8, 0.0), *Alpinia caerulea* (3.8, 0.0), *Archirhodomyrtus beckleri* (3.8, 0.0), *Archontophoenix cunninghamiana* (3.8, 0.0), *Cinnamomum camphora** (3.8, 0.0), *Citrus australis* (3.8, 0.0), *Claoxylon australe* (3.8, 0.0), *Clematicissus opaca* (3.8, 0.0), *Cryptocarya microneura* (3.8, 0.0), *Cryptocarya obovata* (3.8, 0.0), *Cupaniopsis anacardioides* (3.8, 0.0), *Cyclophyllum coprosmoides* var. *coprosmoides* (3.8, 0.0), *Cymbidium canaliculatum* (3.8, 0.0), *Dendrobium aemulum* (3.8, 0.0), *Denhamia celastroides* (3.8, 0.0), *Eucalyptus crebra* (3.8, 0.0), *Ficus coronata* (3.8, 0.0), *Flindersia xanthoxyla* (3.8, 0.0), *Geitonoplesium cymosum* (3.8, 0.0), *Hardenbergia violacea* (3.8, 0.0), *Indigofera australis* (3.8, 0.0), *Kennedia rubicunda* (3.8, 0.0), *Lophostemon suaveolens* (3.8, 0.0), *Melaleuca salicina* (3.8, 0.0), *Mezoneuron scortechinii* (3.8, 0.0), *Opercularia aspera* (3.8, 0.0), *Ozothamnus diosmifolius* (3.8, 0.0), *Pittosporum revolutum* (3.8, 0.0), *Pittosporum undulatum* (3.8, 0.0), *Platycerium bifurcatum* (3.8, 0.0), *Psydrax odorata* forma *australiana* (3.8, 0.0), *Rhodosphaera rhodanthema* (3.8, 0.0), *Santalum obtusifolium* (3.8, 0.0), *Scolopia braunii* (3.8, 0.0), *Stephania japonica* var. *discolor* (3.8, 0.0), *Sterculia quadrifida* (3.8, 0.0), *Syncarpia verecunda* (3.8, 0.0), *Synoum glandulosum* subsp. *glandulosum* (3.8, 0.0), *Trema tomentosa* var. *aspera* (3.8, 0.0)

Stratum: Shrub 2

Height: average: 0.68m; range: 0.60 - 0.75m; (2 sites)

Crown Cover: average: 8.7%; range: 3.4 - 13.9%; (2 sites)

Stem Count: average: 2,100 stems/ha; range: 1,400 - 2,800 stems/ha; std. deviation: 990.0 stems/ha; (2 sites)

Basal area: No data available.

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

Most frequent species (up to 6):

Ptilidostigma rhytispermum (3.8, 6.0), *Lantana camara** (3.8, 3.0), *Cissus antarctica* (3.8, 1.0), *Corymbia trachyphloia* subsp. *trachyphloia* (3.8, 1.0), *Dioscorea transversa* (3.8, 1.0), *Dysoxylum* (3.8, 1.0)

Additional species:

Acacia irrorata subsp. *irrorata* (3.8, 0.5), *Acalypha nemorum* (3.8, 0.5), *Alpinia caerulea* (3.8, 0.5), *Eucalyptus siderophloia* (3.8, 0.5), *Macrozamia lucida* (3.8, 0.5), *Styphelia sieberi* (3.8, 0.4), *Acacia disparrima* subsp. *disparrima* (3.8, 0.2), *Acacia maidenii* (3.8, 0.2), *Allocauarina torulosa* (3.8, 0.2), *Bursaria spinosa* subsp. *spinosa* (3.8, 0.2), *Carissa ovata* (3.8, 0.2), *Monotoca scoparia* (3.8, 0.2), *Myrsine variabilis* (3.8, 0.2), *Alphitonia excelsa* (3.8, 0.0), *Embelia australiana* (3.8, 0.0), *Hovea acutifolia* (3.8, 0.0), *Mallotus philippensis* (3.8, 0.0), *Persoonia iogyna* (3.8, 0.0), *Pittosporum multiflorum* (3.8, 0.0), *Smilax australis* (3.8, 0.0), *Solori involuta* (3.8, 0.0), *Wikstroemia indica* (3.8, 0.0), *Zieria minutiflora* subsp. *minutiflora* (3.8, 0.0)

Stratum: Ground

Height: average: 0.55m; range: 0.30 - 1.10m; (26 sites)

Projective foliage cover (PFC): average: 34.9%; range: 6.2 - 70.0%; (26 sites)

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

Grass - perennial:

Most frequent species (up to 6):

Imperata cylindrica (92.3, 7.0), *Themeda triandra* (69.2, 18.7), *Entolasia stricta* (50.0, 2.2), *Digitaria parviflora* (46.2, 5.1), *Oplismenus aemulus* (46.2, 0.4), *Panicum effusum* (30.8, 0.7)

Additional species:

Ottochloa gracillima (26.9, 12.5), *Oplismenus imbecillis* (23.1, 1.3), *Cymbopogon refractus* (19.2, 1.2), *Poa labillardierei* var. *labillardierei* (19.2, 6.2), *Microlaena stipoides* (15.4, 0.8), *Sporobolus laxus* (11.5, 1.0), *Aristida queenslandica* var. *queenslandica* (7.7, 1.0), *Dichelachne micrantha* (7.7, 1.0), *Eremochloa bimaculata* (7.7, 1.8), *Paspalidium distans* (7.7, 0.5), *Alloteropsis semialata* (3.8, 1.0), *Aristida* (3.8, 0.5), *Arundinella nepalensis* (3.8, 6.0), *Capillipedium parviflorum* (3.8, 0.0), *Capillipedium spicigerum* (3.8, 0.2), *Chrysopogon sylvaticus* (3.8, 0.2), *Digitaria minima* (3.8, 0.2), *Eragrostis spartinoidea* (3.8, 0.0), *Heteropogon contortus* (3.8, 2.0), *Melinis minutiflora** (3.8, 2.0), *Melinis repens** (3.8, 0.2), *Ottochloa nodosa* (3.8, 5.0), *Paspalidium* (3.8, 0.0), *Paspalidium gausum* (3.8, 0.0), *Paspalum scrobiculatum* (3.8, 0.0), *Poa* (3.8, 6.0), *Urochloa decumbens** (3.8, 0.0)

Grass - annual/biennial:

Not present

Forbs & other:

Most frequent species (up to 6):

Cyanthillium cinereum (80.8, 0.2), *Desmodium rhytidophyllum* (76.9, 1.4), *Lomandra longifolia* (76.9, 1.6), *Eustrephus latifolius* (73.1, 0.6), *Dianella caerulea* (69.2, 1.8), *Desmodium gunnii* (65.4, 0.2)

Additional species:

Pteridium esculentum (50.0, 4.2), *Hardenbergia violacea* (46.2, 0.0), *Lepidosperma laterale* var. *laterale** (42.3, 1.3), *Smilax australis* (42.3, 0.2), *Pigea stellarioides* (38.5, 0.3), *Sigesbeckia orientalis* (38.5, 0.2), *Glycine clandestina* var. *clandestina* (34.6, 0.2), *Coleus australis* (30.8, 0.0), *Kennedia rubicunda* (30.8, 1.5), *Lantana camara** (30.8, 1.7), *Lobelia purpurascens* (30.8, 0.6), *Stephania japonica* var. *discolor* (30.8, 0.0), *Breynia oblongifolia* (26.9, 0.0), *Causonis clematidea* (26.9, 1.2), *Cissus antarctica* (26.9, 2.1), *Cissus hypoglauca* (26.9, 0.8), *Brunoniella australis* (23.1, 0.2), *Clematicissus opaca* (23.1, 0.0), *Commelina diffusa* (23.1, 0.2), *Cyperus laevis* (23.1, 0.2), *Drynaria rigidula* (23.1, 4.0), *Glycine tabacina* (23.1, 0.2), *Goodenia rotundifolia* (23.1, 1.1), *Rubus parvifolius* (23.1, 0.5), *Bidens pilosa** (19.2, 0.0), *Dioscorea transversa* (19.2, 1.0), *Indigofera australis* (19.2, 0.0), *Lomandra confertifolia* subsp. *pallida* (19.2, 1.3), *Lomandra laxa* (19.2, 1.6), *Lomandra multiflora* subsp. *multiflora* (19.2, 1.2), *Oxalis chnoodes* (19.2, 0.0), *Pseuderanthemum variabile* (19.2, 0.6), *Scleria mackaviensis* (19.2, 0.2), *Teucrium argutum* (19.2, 0.2), *Wikstroemia indica* (19.2, 0.2), *Acacia disparrima* subsp. *disparrima* (15.4, 1.0), *Blechnum cartilagineum* (15.4, 5.5), *Blechnum neohollandicum* (15.4, 13.0), *Blechnum rupestre* (15.4, 0.2), *Calochlaena dubia* (15.4, 6.0), *Centratherum riparium* (15.4, 0.0), *Geitonoplesium cymosum* (15.4, 0.0), *Geranium solanderi* var. *solanderi* (15.4, 1.6), *Myrsine variabilis* (15.4, 0.2), *Passiflora subpeltata** (15.4, 0.2), *Phyllanthus virgatus* (15.4, 0.0), *Rubus moluccanus* var. *trilobus* (15.4, 0.0), *Viola hederacea* (15.4, 0.0), *Acacia maidenii* (11.5, 0.0), *Acrotriche aggregata* (11.5, 0.2), *Adiantum aethiopicum* (11.5, 0.0), *Adiantum hispidulum* (11.5, 2.0), *Alphitonia excelsa* (11.5, 0.2), *Astrotricha latifolia* (11.5, 0.0), *Chamaecrista mimosoides* (11.5, 0.0), *Crassocephalum crepidioides** (11.5, 0.0), *Cymbidium madidum* (11.5, 0.0), *Hibbertia aspera* (11.5, 0.7), *Hydrocotyle laxiflora* (11.5, 0.0), *Passiflora suberosa** (11.5, 0.8), *Platylobium formosum* (11.5, 12.3), *Acalypha nemorum* (7.7, 0.0), *Ageratina riparia** (7.7, 0.0), *Ageratum houstonianum** (7.7, 0.0), *Alpinia caerulea* (7.7, 1.0), *Aneilema acuminatum* (7.7, 0.0), *Baccharis halimifolia** (7.7, 0.0), *Billardiera scandens* (7.7, 0.0), *Blechnum doodianum* (7.7, 0.0), *Carex breviculmis* (7.7, 0.0), *Cassytha filiformis* (7.7, 0.0), *Centella asiatica* (7.7, 0.0), *Cheilanthes sieberi* (7.7, 0.2), *Cheilanthes tenuifolia* (7.7, 0.5), *Corymbia citriodora* subsp. *variegata* (7.7, 2.0), *Corymbia intermedia* (7.7, 0.6), *Crotalaria montana* (7.7, 0.0), *Cyperus cyperoides* (7.7, 0.0), *Davallia pyxidata* (7.7, 0.0), *Desmodium brachypodium* (7.7, 0.0), *Dianella caerulea* var. *vannata* (7.7, 0.0), *Euroschinus falcatus* var. *falcatus* (7.7, 0.0), *Gomphocarpus fruticosus** (7.7, 0.0), *Grewia latifolia* (7.7, 0.0), *Guioa semiglauca* (7.7, 0.0), *Gymnostachys anceps* (7.7, 0.5), *Hibbertia stricta* (7.7, 0.0), *Jagera pseudorhus* var. *pseudorhus* (7.7, 0.0), *Lobelia gibbosa* (7.7, 0.0), *Lomandra* (7.7, 0.4), *Lophostemon confertus* (7.7, 3.6), *Lordhowea amygdalifolia* (7.7, 2.0), *Macrozamia lucida* (7.7, 0.5), *Myrsine angusta* (7.7, 0.0), *Olea paniculata* (7.7, 0.0), *Phyllanthus gunnii* (7.7, 0.2), *Pilidiostigma rhytispermum* (7.7, 0.2), *Pittosporum revolutum* (7.7, 0.0), *Plantago debilis* (7.7, 0.0), *Psychotria loniceroides* (7.7, 0.2), *Pultenaea retusa* (7.7, 0.0), *Sceptridium australe* (7.7, 0.0), *Secamone elliptica* (7.7, 0.0), *Solanum densevestitum* (7.7, 0.0), *Tetrastigma nitens* (7.7, 1.0), *Verbena rigida** (7.7, 0.0), *Xanthorrhoea latifolia* subsp. *latifolia* (7.7, 2.5), *Zieria minutiflora* subsp. *minutiflora* (7.7, 0.0), *Zieria smithii* (7.7, 0.0), *Acacia leiocalyx* subsp. *leiocalyx* (3.8, 0.0), *Acacia longissima* (3.8, 2.0), *Acacia melanoxylon* (3.8, 0.0), *Acomis acoma* (3.8, 0.5), *Acronychia laevis* (3.8, 0.0), *Ajuga australis* (3.8, 0.0), *Allocasuarina littoralis* (3.8, 0.2), *Allocasuarina torulosa* (3.8, 0.5), *Amyema congener* (3.8, 0.0), *Amyema miquelii* (3.8, 0.0), *Anisomeles moschata* (3.8, 0.0), *Archidendron grandiflorum* (3.8, 0.0), *Aristolochia meridionalis* (3.8, 0.0), *Austrosteenisia blackii* (3.8, 0.0), *Banksia integrifolia* subsp. *comparr* (3.8, 0.0), *Carex declinata* (3.8, 0.0), *Carex inversa* (3.8, 0.0), *Cassytha glabella* forma *glabella* (3.8, 2.0), *Cassytha pubescens* (3.8, 0.0), *Celastrus subspicata* (3.8, 1.0), *Chamaecrista nomame* var. *nomame* (3.8, 0.0), *Cinnamomum camphora** (3.8, 0.2), *Clematis glycinoides* (3.8, 0.0), *Clerodendrum*

floribundum (3.8, 0.0), *Commelina lanceolata* (3.8, 0.6), *Cordylone congesta* (3.8, 0.0), *Crotalaria lanceolata* subsp. *lanceolata** (3.8, 0.2), *Cryptocarya glaucescens* (3.8, 0.2), *Cryptocarya microneura* (3.8, 0.0), *Cyperus enervis* (3.8, 0.0), *Decaneuropsis obovata* (3.8, 0.0), *Dendrobium aemulum* (3.8, 0.0), *Denhamia celastroides* (3.8, 0.0), *Desmodium microphyllum* (3.8, 0.0), *Desmodium nemorosum* (3.8, 0.0), *Desmodium varians* (3.8, 0.0), *Dianella caerulea* var. *assera* (3.8, 0.5), *Dianella revoluta* (3.8, 0.0), *Dichondra repens* (3.8, 0.0), *Dockrillia linguiformis* (3.8, 0.0), *Drypetes deplanchei* (3.8, 0.0), *Emilia sonchifolia** (3.8, 0.2), *Erigeron* (3.8, 0.0), *Erigeron bonariensis** (3.8, 0.0), *Eucalyptus microcorys* (3.8, 3.0), *Eupomatia bennettii* (3.8, 0.0), *Eupomatia laurina* (3.8, 0.0), *Euroschinus falcatus* (3.8, 0.0), *Fimbristylis dichotoma* (3.8, 0.0), *Flagellaria indica* (3.8, 0.0), *Flemingia parviflora* (3.8, 0.0), *Gahnia aspera* (3.8, 0.5), *Glochidion ferdinandi* var. *ferdinandi* (3.8, 0.0), *Glycine clandestina* (3.8, 0.4), *Glycine tomentella* (3.8, 0.0), *Gomphocarpus physocarpus** (3.8, 0.0), *Hackelia suaveolens* (3.8, 0.0), *Hibbertia aspera* subsp. *aspera* (3.8, 1.6), *Hibbertia dentata* (3.8, 0.0), *Hibbertia scandens* (3.8, 0.0), *Hibbertia vestita* (3.8, 0.0), *Hovea acutifolia* (3.8, 0.0), *Hydrocotyle paludosa* (3.8, 0.0), *Hypericum gramineum* (3.8, 0.0), *Hypochoeris radicata** (3.8, 0.0), *Hypoxis pratensis* (3.8, 0.0), *Ipomoea plebeia* (3.8, 0.0), *Jacksonia scoparia* (3.8, 0.0), *Leichhardtia coronata* (3.8, 0.0), *Leichhardtia fraseri* (3.8, 0.0), *Leichhardtia lloydii* (3.8, 0.0), *Lespedeza juncea* subsp. *sericea* (3.8, 9.0), *Lobelia trigonocaulis* (3.8, 0.6), *Lomandra filiformis* subsp. *filiformis* (3.8, 0.0), *Lomandra hystrix* (3.8, 1.0), *Maclura cochinchinensis* (3.8, 0.0), *Melastoma malabathricum* subsp. *malabathricum* (3.8, 0.0), *Melodinus australis* (3.8, 0.0), *Ochna serrulata** (3.8, 0.0), *Olearia nemstii* (3.8, 0.0), *Oxalis rubens* (3.8, 0.0), *Pandorea pandorana* (3.8, 0.0), *Parsonsia straminea* (3.8, 0.0), *Passiflora aurantia* (3.8, 0.0), *Passiflora foetida** (3.8, 0.0), *Persoonia sericea* (3.8, 0.2), *Pigea enneasperma* (3.8, 0.0), *Platynerium bifurcatum* (3.8, 0.0), *Polygala japonica* (3.8, 0.0), *Polyscias sambucifolia* (3.8, 0.0), *Poranthera microphylla* (3.8, 0.0), *Psilotum nudum* (3.8, 0.0), *Psychotria daphnoides* (3.8, 0.0), *Pterostylis nutans* (3.8, 0.0), *Pyrrosia confluens* (3.8, 0.0), *Ranunculus lappaceus* (3.8, 0.0), *Rhodamnia rubescens* (3.8, 0.0), *Scleria brownii* (3.8, 0.0), *Senecio pinnatifolius* (3.8, 0.0), *Solanum americanum** (3.8, 0.0), *Sterculia quadrifida* (3.8, 0.0), *Styphelia sieberi* (3.8, 0.0), *Telmatoblechnum indicum* (3.8, 0.0), *Tephrosia filipes* (3.8, 0.0), *Tephrosia rufula* (3.8, 0.0), *Thysanotus tuberosus* (3.8, 0.0), *Trachymene procumbens* (3.8, 0.5), *Trema tomentosa* var. *aspera* (3.8, 0.0), *Trochocarpa laurina* (3.8, 0.0), *Veronica plebeia* (3.8, 0.0), *Vigna vexillata* (3.8, 0.0), *Viola banksii* (3.8, 1.0), *Viola betonicifolia* (3.8, 0.0), *Xanthorrhoea johnsonii* (3.8, 0.0), *Zornia dyctiocarpa* (3.8, 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.