APPENDIX J

INLAND RAIL

Terrestrial and Aquatic Ecology Technical Report

PART 4 OF 4

Appendices H to K

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix H Aquatic Ecology Survey Sites

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Appendix H
Aquatic Ecology Survey Sites

Site	Description	Photo
1A	The site is located on Western Creek, at the proposed Project alignment waterway crossing location. No artificial bank protected measures were present. The riparian vegetation was disturbed at the crossing location.	
1A (alt)	Site located on Western Creek, downstream of the Project alignment. Artificial bank protection measures present include a timber wall present associated with the bridge crossing. Lots of riparian vegetation surrounding the site.	
2A	Site is located on the Bremer River, at the proposed Project alignment waterway crossing location. At the time of assessment, the channel was dry. Artificial bank protection measures were present in the form of a dam wall.	

Site	Description	Photo
3A	Site located on Warrill Creek, at the proposed Project alignment waterway crossing location. No artificial bank protected measures were present. A pump was presentation potentially used for water extraction.	
5A	Site was located in a private rural farm dam located downstream of the Project alignment. Artificial bank protection measures were present in the form of an approximate 20 m section of concrete channel lining along the bank.	
5A (1)	Site was located on an unnamed waterway the proposed alignment crossing. The creek was dry at the time of assessment. There were no artificial bank protection measures present. Bed level crossing, grazing and fences were present along the creek. The riparian zone was highly disturbed.	

Site	Description	Photo
6A	Site located on the upper tributary of Purga Creek, upstream of the Project alignment. Banks were eroded, potentially affected by cleared vegetation, stock access, human access and the road crossing and associated culvert (approximately 30cm in diameter). Artificial bank measures include a rock layer associated with the road crossing.	
7A	Site was located on an un-named waterway, upstream of the Project alignment. Banks are highly eroded, potentially affected by cleared vegetation, stock access and human access. There were no artificial bank protection measures present at site. Cattle was present and using the site	
7A (alt)	Site was located on an un-named waterway, upstream of the Project alignment. At the time of assessment, the waterway was dry. There were no artificial bank protection measures present	

Site	Description	Photo
8A	Site was located on an un-named waterway, at the proposed crossing location. The bank was highly eroded potentially affected by stock access and human access. There were no artificial bank protection measures present.	
9A	Site located on the Woollamen Creek, upstream of the Project alignment in road crossing over a small bridge. Lots of riparian bank vegetation present. Bank eroded potentially affected by cleared vegetation, stock access, cattle were noted drinking at the site. Additionally, rip rap was present along the bank as a protected measure.	
10A	Site located on the Tevoit Brook River over a road crossing. Artificial bank measures were present in the form of a rock wall, fence structures and remains of a sediment fence were present. 3RCP present. Banks are eroded potentially affected by cleared vegetation, stock access and human access. Vegetation is present along the banks.	

Site	Description	Photo
11A	Site was located in a private rural farm dam, downstream of the Project alignment. Site is flat with minimal vegetation present. Dam is used by stock	
12A	Site was located on an un-named waterway, upstream of the Project alignment. Banks were eroded, potentially affected by stock access, human access and feral animals. There were no artificial bank protection measures present.	
13A	Site was located on the upper tributary of Purga Creek at the proposed alignment crossing. A single RCP culvert design was present, with an additional rock layer associated with the road crossing as an artificial bank measure and concrete channel lining was also present	

Site	Description	Photo
14A	Site was located on Sandy Creek, downstream of the Project alignment. Modifications were present in the form of concrete and rock associated with Allans Road crossing. Six box culvert design was present at the road crossing with rock reinforcement. Some vegetation and debris on the floor surface creating barriers	

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix I Completed vegetation assessment proformas

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	11-Sep
Observers:	CT
Site name	1

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50 m
Start point coordinate	0482279 6917673			
End point coordinate	0482332 6917658			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	12-18m		2-6m	<1
Av. Height (m):	16m		4m	<1
Cover (%):	See interecept data		40%	20%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Casuarina cunninghamiana - D*	*NA*	*Lantana camara - D*	*Eustrephus latifolius - S*
			Ficus oppositifolia - S	*Parthenium hysterophorus - S*
			Melaleuca viminalis - C	*Cynodon dactylon - D*
				Megathyrsus maximus - D

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.7**	**12.3.7**	
Landform:		**Allvuial**	
Soils:		**Sand**	
Structural formation (eg woodland, open-forest etc.:		**Forest**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Dense Lantana infestation, havily grazed by cattle**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lantana camara 20-40%, Parthenium hysterophorus <5%, Aristolochia elegans 10%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	3.9		15	Minimum height of plants included in the transect table:	12 m
4.2	11.1		18		
11.5	21		14		
22	26.3		17	Intercept of EDL 0 - 50m:	
29.8	39		18		
41	44.7		17		
				Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Casuarina cunninghamiana	*Bidens pilosa*	
Lantana camara	*Celtis sinensis*	
Melaleuca viminalis	*Eucalyptus tereticornis*	
Parthenium hysterophorus	*Lantana montevidensis*	
Ficus oppositifolia	*Imperata cylindrica*	
Cynodon dactylon	*Passiflora suberosa*	
Aphananthe philippinensis	*Heteropogon contortus*	
Aristolochia elegans	*Jagera pseudorhus*	
Lomandra longifolia	*Corymbia tessellaris*	
Eustrephus latifolius	*Angophora subvelutina*	
Megathyrsus maximus	*Juncus continuus*	
Maclura cochinchinensis	*Cyperus exaltatus*	
Gomphocarpus physocarpus	*Oxalis perennans*	
Acacia disparrima	*Oplismenus aemulus*	
Asclepias curassavica		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	11-Sep
Observers:	CT
Site name	2

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50 m
Start point coordinate	0481976 6917455			
End point coordinate	0481931 6917458			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	10-12m		2-6m	<1
Av. Height (m):	12m		4m	
Cover (%):	See interecept data		20-40%	50-60%
	Corymbia tessellaris - D	*NA*	*Acacia disparrima - C*	*Heteropogon contortus - C*
			Lantana camara - D	*Lantana montevidensis - D*
				Cymbopogon refractus - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non-rem	Confirmed Regional Ecosystem:	Non-rem
Landform:		Sandstone	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Highly dissected/cleared regrowth vegetation	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana montevidensis - 30%, Opuntia stricta - 1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
12	15.1	3.1	11 m	Minimum height of plants included in the transect table:	10 m
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia tessellaris	*Sida cordifolia*	
Corymbia intermedia	*Glycine tabacina*	
Acacia disparrima	*Wahlenbergia gracilis*	
Lantana camara	*Eustrephus latifolius*	
Alphitonia excelsa	*Senecio sp*	
Aristida sp	*Petalostigma pubescens*	
Eragrostis sp	*Exocarpos cupressiformis*	
Heteropogon contortus	*Corymbia citriodora*	
Cassytha pubescens		
Cymbopogon refractus		
Maclura cochinchinensis		
Lantana montevidensis		
Melinis repens		
Panicum effusum		
Opuntia stricta		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	12-Sep
Observers:	CT
Site name	3

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	100m
Start point coordinate	0481164 6918983			
End point coordinate	0481246 6918943			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	14-18m	8-12m	2-5m	<1
Av. Height (m):	16m	10	3m	
Cover (%):	See interecept data	15%	20%	60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	Corymbia citriodora - D	Corymbia intermedia - S	Alphitonia excelsa - C	Heteropogon contortus - C
	Eucalyptus tereticornis - C		Acacia disparrima - C	Lantana montevidensis - D
	Eucalyptus crebra - S		Allocasuarina torulosa - C	Xanthorrhoea johnsonii - S
			Lantana camara - S	

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.2**	**Confirmed Regional Ecosystem:**	**12.9-10.2**
Landform:		**Sandstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**High level of Lantana montevidensis in ground layer**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lantana montevidensis - 40%, Lantana camara - 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
24.2	36	11.8	18m	Minimum height of plants included in the transect table:	14 m
43	52.3	9.3	17m		
89.2	91.6	2.4	16m		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora	*Cassytha pubescens*	
Eucalyptus tereticornis	*Heteropogon contortus*	
Eucalyptus crebra	*Lantana montevidensis*	
Corymbia intermedia	*Aristida personata*	
Eucalyptus melanophloia	*Lomandra filiformis*	
Allocasuarina torulosa	*Eustrephus latifolius*	
Alphitonia excelsa	*Bothriochloa decipiens*	
Lantana camara	*Panicum queenslandicum*	
Brachychiton populneus	*Crassocephalum apiculatum*	
Acacia disparrima	*Imperata cylindrica*	
Xanthorrhoea johnsonii	*Melinis repens*	
Breynia oblongifolia	*Dianella revoluta*	
Jagera pseudorhus	*Chloris truncata*	
Ficus rubiginosa		
Cymbopogon refractus		

VEGETATION PROFORMA

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Date:	12-Sep
Observers:	CT
Site name	4

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	0481831 6918471			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	16-22m	7-10m	1-5m	<1
Av. Height (m):	18m	8m	3m	
Cover (%):	40%	15%	40%	30%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	Casuarina cunninghamiana - D	Casuarina cunninghamiana - D	Lantana camara - D	Oplismenus aemulus - C
	Eucalyptus tereticornis - S	Streblus brunonius - S	Melaleuca viminalis - C	Lomandra longifolia - C
	Corymbia tessellaris - S			Cymbopogon refractus - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.7**	**Confirmed Regional Ecosystem:**	**12.3.7**
Landform:		**Alluvium**	
Soils:		**Sand**	
Structural formation (eg woodland, open-forest etc.:		**Open forest**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Heavy grazing/trampling**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lantana camara - 30%, Senecio madagascariensis <5%,**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Casuarina cunninghamiana	*Senecio madagascariensis*	
Eucalyptus tereticornis	*Mallotus philippensis*	
Angophora subvelutina	*Solanum mauritianum*	
Aristolochia elegans	*Ageratina riparia*	
Maclura cochinchinensis	*Cirsium vulgare*	
Lomandra longifolia	*Sida hackettiana*	
Lantana camara	*Cyperus gracilis*	
Streblus brunonius	*Emilia sonchifolia*	
Juncus continuus	*Achyranthes aspera*	
Marsilea drummondii	*Breynia oblongifolia*	
Ficus rubiginosa	*Bursaria spinosa*	
Oxalis perennans	*Commelina diffusa*	
Melaleuca viminalis	*Conyza bonariensis*	
Corymbia tessellaris	*Alchornea ilicifolia*	
Angophora subvelutina		

VEGETATION PROFORMA

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Integrating Community, Environment and Engineering

Date:	12-Sep
Observers:	CT
Site name	5

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	0481613 6917056			
End point coordinate	0481605 6917003			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	8-14 m	6-8m	1-4m	<1
Av. Height (m):	10m	7m	3m	
Cover (%):	See interecept data	20%	20%	60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus crebra - C*	*Lophostemon confertus - D*	*Lophostemon confertus - S*	*Heteropogon contortus - C*
	Corymbia citriodra - C		*Acacia disparrima - S*	*Eustrephus latifolius - C*
	Eucalyptus acmenoides - C		*Jacksonia scoparia - S*	*Imperata cylindrica - C*
			Lantana camara - S	*Cymbopogon refractus - C*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.17a**	**Confirmed Regional Ecosystem:**	**12.9-10.17a**
Landform:		**Sandstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Good condition**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lantana camara <5%, Lantana montevidensis <5%, Opuntia stricta 1%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
5	6.1		12m	Minimum height of plants included in the transect table:	8m
8	9.8		14m		
17	23.4		12m		
35.1	39.2		14m	Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	n/a
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora	*Eustrephus latifolius*	
Eucalyptus crebra	*Smilax australis*	
Eucalyptus acmenoides	*Hoya australis*	
Grewia latifolia	*Aristida personata*	
Lophostemon confertus	*Panicum effusum*	
Acacia disparrima	*Cheilanthes sieberi*	
Alphitonia excelsa	*Hardenbergia violacea*	
Jagera pseudorhus	*Desmodium rhytidophyllum*	
Dodonaea triquetra	*Lantana montevidensis*	
Imperata cylindrica	*Opuntia stricta*	
Heteropogon contortus	*Jasminum simplicifolium*	
Dianella revoluta		
Panicum queenslandicum		
Cymbopogon refractus		
Melinis repens		

VEGETATION PROFORMA

Future Freight
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Date:	12-Sep
Observers:	CT
Site name	6

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	480482 6919520			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated"
Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	6-8m		1-4m	<1
Av. Height (m):	7m		3m	
Cover (%):	<5%		5%	60%
	Corymbia tessellaris - S	*NA*	*Lantana camara - S*	*Senecio madagascariensis - C*
				Cynodon dactylon - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non-rem	Confirmed Regional Ecosystem:	Non-rem
Landform:		Sandstone hills	
Soils:		Clay loam	
Structural formation (eg woodland, open-forest etc.:		Non-remnant cleared	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Cleared vegetation with scattered trees	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Senecio madagascariensis - 20%, Lantana camara - 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia tessellaris		
Acacia disparrima		
Lantana camara		
Nymphoides indica		
Juncus continuus		
Senecio madagascariensis		
Cynodon dactylon		
Cyperus gracilis		
Imperata cylindrica		
Gomphocarpus physocarpus		
Cirsium vulgare		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	12-Sep
Observers:	CT
Site name	7

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	480277 6919395			
End point coordinate	480259 6919439			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	8-11m		2-6m	<1
Av. Height (m):	9m		4m	
Cover (%):	See interecept data		5%	50%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus crebra - C*	*NA*	*Eucalyptus crebra - C*	*Cymbopogon refractus - D*
	Corymbia citriodora - C		*Lantana camara - C*	*Heteropogon contortus - C*
	Eucalyptus melanophloia - S		*Acacia disparrima - C*	*Lantana montevidensis - C*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non-rem	Confirmed Regional Ecosystem:	Non-rem
Landform:		Sandstone hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Regrowth	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 5%, Lantana montevidensis - 10%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
6	9.5		8	Minimum height of plants included in the transect table:	8 m
27.4	28.3		9		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Corymbia citriodora		
Eucalyptus melanophloia		
Lantana camara		
Acacia disparrima		
Acacia leiocalyx		
Heteropogon contortus		
Aristida personata		
Chrysocephalum apiculatum		
Aristida calycina		
Eragrostis brownii		
Lantana montevidensis		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	12-Sep
Observers:	CT
Site name	8

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	479217 6919953			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated"
Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	8-11m	6-8m	1-3m	<1
Av. Height (m):	9m	7m	2m	
Cover (%):	10-20%	10%	10%	30%
	Corymbia citriodora - D	*Corymbia citriodora - C*	*Lantana camara - C*	*Heteropogon contortus - C*
	Eucalyptus crebra - S	*Eucalyptus crebra - C*	*Alphitonia excelsa - S*	*Lantana montevidensis - C*
				Xanthorrhoea johnsonii - S
				Cymbopogon refractus - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non-remnant	Confirmed Regional Ecosystem:	Non-remnant
Landform:		Sandstone hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Regrowth with sparse large trees	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 5%, Lantana montevidensis - 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (<u>15-20 minute</u> random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora	*Achyranthes aspera*	
Eucalyptus crebra		
Alphitonia excelsa		
Xanthorrhoea johnsonii		
Lantana camara		
Heteropogon contortus		
Aristida personata		
Dianella revoluta		
Melinis repens		
Cymbopogon refractus		
Chrysocephalum apiculatum		
Pterocaulon redolens		
Panicum queenslandicum		
Cheilanthes sieberi		
Eragrostis brownii		

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Date:	13-Sep-17
Observers:	CT
Site name	9

Transect Details (required for all sites)

GPS coordinates:	**Datum:**		**Transect Length**	**100m**
Start point coordinate	478035 6920045			
End point coordinate	477938 6920060			
Photos (north south east west)		yes/no	**Yes**	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	**Tree 2**	**Shrub#**	**Ground**
Height Range (m):	17-21	8-13	2-5	<1
Av. Height (m):	19	10	3	<1
Cover (%):	See interecept data	10	20	70
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single stemmed < 2m tall.	*Corymbia citriodora - D*	*Corymbia citriodora - C*	*Lantana camara - D*	*Cymbopogon refractus - D*
	Eucalyptus crebra - C	*Eucalyptus crebra - C*	*Corymbia citriodora - C*	*Aristida calycina - C*
				Lantana montevidensis - D
				Lomandra multiflora - C

Table 2

Mapped Regional Ecosystem:	12.9-10.2/12.9-10.7	Confirmed Regional Ecosystem:	12.9-10.2
Landform:		Sandstone hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Minimal cattle grazing impact, disturbance from rabbit burrowing, lantana, signs of selective logging	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 5%, Lantana montevidensis - 20%, Opuntia stricta <1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	6.1		19	Minimum height of plants included in the transect table:	17
6.3	14.5		21		
17	19.1		20		
65.1	69.5		17	Intercept of EDL 0 - 50m:	
70.5	74.3		19		
84.2	87.1		18		
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora	*Goodenia hederacea*	
Eucalyptus crebra	*Aristida personata*	
Corymbia tessellaris	*Imperata cylindrica*	
Eucalyptus melanophloia	*Eremophila debilis*	
Eustrephus latifolius	*Sida hackettiana*	
Aristida personata	*Lantana montevidensis*	
Glycine tabacina	*Eragrostis brownii*	
Sida cordifolia	*Heteropogon contortus*	
Acacia sp	*Cymbopogon refractus*	
Alphitonia excelsa	*Melinis repens*	
Lantana camara	*Chrysocephalum apiculatum*	
	Imperata cylindrica	
	Dianella revoluta	
	Pandorea pandorana	
	Wahlenbergia gracilis	

VEGETATION PROFORMA

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Date:	13-Sep
Observers:	CT
Site name	10

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50
Start point coordinate	476703 6922268			
End point coordinate	476667 6922243			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Gro
Height Range (m):	8-Dec		1-5	<
Av. Height (m):	9		3	
Cover (%):	See interecept data		5	7
	Eucalyptus tereticornis - S	*NA*	*Lantana camara -S*	*Aristida pe*
	Eucalyptus siderophloia - S			*Lantana mon*
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus crebra - S*			*Aristida quee*
				Cymbopogon

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Non rem
Landform:		Sandstone hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Cleared woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Cleared vegetation with sparse scattered trees	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 5 %, Lantana montevidensis - 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	3.1		10m	Minimum height of plants included in the transect table:	
48.1	50		9m		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis		
Eucalyptus crebra		
Eucalyptus siderophloia		
Corymbia citriodora		
Lantana camara		
Cymbopogon refractus		
Aristida personata		
Lantana montevidensis		
Eragrostis brownii		
Lomandra multiflora		
Melinis repens		
Maireana imcrophylla		

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Date:	13-Sep
Observers:	CT
Site name	11

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	475750 6923592			
End point coordinate				
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	8-12	6-8	1-4	<1
Av. Height (m):	9	7	2	
Cover (%):	25	20	<5	
	Corymbia citriodora - D	*Corymbia citriodora - D*	*Acacia disparrima - S*	*Eremophila debilis - C*
	Eucalyptus crebra - C	*Eucalyptus crebra - C*	*Acacia concurrens - S*	*Aristida personata - C*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Regrowth 12.9-10.2
Landform:		Sandstone low hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Selectively cleared, no shrub layer. Heavily grazed ground layer	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Opuntia stricta <1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora		
Eucalyptus crebra		
Acacia concurrens		
Aristida personata		
Eragrostis brownii		
Eremophila debilis		
Laxmannia gracilis		
Dianella revoluta		
Hardenbergia violacea		
Lomandra multiflora		
Opuntia stricta		
Achyranthes aspera		
Aristida personata		
Gomphrena celasioides		

VEGETATION PROFORMA

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Date:	14-Sep
Observers:	CT
Site name	12

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	462328 6936278			
End point coordinate	462283 6936274			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	19-23m	8-14	2-5	<1
Av. Height (m):	21	10	4	
Cover (%):	See interecept data	15	15	60
	Eucalyptus tereticornis - D	*Eucalyptus tereticornis - C*	*Acacia leiocalyx - C*	*Aristida calycina -C*
	Eucalyptus crebra -S	*Eucalyptus crebra - C*	*Alphitonia excelsa - C*	*Bryophyllum delagoense - C*
				Aristida brownii - C
				Cynodon dactylon - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.19**	**Confirmed Regional Ecosystem:**	**12.3.3**
Landform:		**Alluvial**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**No Melaleuca irbyana present**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Bryophyllum delagoense - 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
5.3	11.4		21	Minimum height of plants included in the transect table:	19
12.9	17		20		
36.1	41.2		23		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis		
Eucalyptus crebra		
Corymbia tessellaris		
Eucalyptus melanophloia		
Acacia leiocalyx		
Acacia salicina		
Aristida calycina		
Juncus continuus		
Cynodon dactylon		
Bryophyllum delagoense		
Eremophila debilis		
Dianella revoluta		
Cymbopogon refractus		

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Date:	14-Sep
Observers:	CT
Site name	13

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	100m
Start point coordinate	462164 6936560			
End point coordinate	462072 6936530			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	18-21	12-18	2-5	<1
Av. Height (m):	19	14	4	
Cover (%):	See interecept data	10	15	60
	Eucalyptus crebra - D	*Eucalyptus crebra - D*	*Acacia leiocalyx - C*	*Aristida calycina - D*
	Corymbia tessellaris - S	*Corymbia tessellaris - S*		*Dianella revoluta - S*
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus melanophloia -S*			*Cymbopogon refractus - C*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.27**	**Confirmed Regional Ecosystem:**	**12.9-10.7**
Landform:		**Sanstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):			
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Opuntia stricta <1%, Bryophyllum delagoense - 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
9.5	12.1		21	Minimum height of plants included in the transect table:	18
15.1	18		19		
22.3	24.5		20		
43	46.1		18	Intercept of EDL 0 - 50m:	
65.1	70.3		22		
85	86.7		18		
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Corymbia tessellaris		
Acacia leiocalyx		
Allocasuarina littoralis		
Alphitonia excelsa		
Alstonia constricta		
Ozothamnus diosmifolius		
Cymbopogon refractus		
Aristida calycina		
Lomandra multiflora		
Eragrostis brownii		
Bryophyllum delagoense		
Parsonsia straminea		
Opuntia stricta		

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Date:	14-Sep
Observers:	CT
Site name	14

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	462269 6936647			
End point coordinate	462280 6936797			
Photos (north south east west)		yes/no	YES	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	14-19	6-8	2-6	<1
Av. Height (m):	16	7	4	
Cover (%):	See interecept data	20	10	40
	Eucalyptus crebra - D	*Melaleuca irbyana - D*	*Alphitonia excelsa - C*	*Aristida personata - C*
			Melaleuca irbyana - C	*Cymbopogon refractus - C*
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single			*Acacia salicina - C*	*Chloris truncata -S*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	12.9-10.27
Landform:		Sandstone hills	
Soils:		Sandy clay loam	
Structural formation (eg woodland, open-forest etc.:		Wodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Sparse M irbyana in mid layer but does not meet height or density for TEC	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana montevidensis - 5%, Opuntia tomentosa - 1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	6.1		18	Minimum height of plants included in the transect table:	14
6.3	10.9		17		
19.4	20.8		17		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (<u>15-20 minute</u> random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Acacia salicina		
Opuntia tomentosa		
Acacia leiocalyx		
Ozothamnus diosmifolius		
Aristida personata		
Aristida calycina		
Cymbopogon refractus		
Lantana montevidensis		
Chrysocephalum apiculatum		
Eremophila debilis		
Parsonsia straminea		

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Date:	14-Sep
Observers:	CT
Site name	16

NB no flora site at site 15 as fauna assessment inky

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	462903 6936597			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	18-25	10-16	1-5	<1
Av. Height (m):	22	14	3	
Cover (%):	25	15	10	60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus tereticornis - D*	*Eucalyptus tereticornis - D*	*Acacia salicina - C*	*Aristida personata - C*
		Eucalyptus crebra - S		*Bryophyllum delagoense - C*
				Chloris truncata - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.3.19	Confirmed Regional Ecosystem:	12.3.3
Landform:		Alluvial	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Bryophyllum	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Bryopyllum delagoense - 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis		
Corymbia tesselaris		
Acacia salicina		
Acacia leiocalyx		
Aristida pesonata		
Chloris truncata		
Eremophila debilis		
Bryophyllum delagoense		
Dianella sp		

VEGETATION PROFORMA

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Date:	14-Sep
Observers:	CT
Site name	17

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0
Start point coordinate	462918 6936694			
End point coordinate				
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Gro
Height Range (m):	18-25	10-15	2-6	<
Av. Height (m):	22	13	3	
Cover (%):	30	15	20	5
	Eucalyptus crebra - D	*Eucalyptus crebra - D*	*Acacia salicina - D*	*Aristida per*
		Eucalyptus melanophloia - S		

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.9-10.27	Confirmed Regional Ecosystem:	12.9-10.7
Landform:		Sanstone lower hills	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Seectively cleared	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Opuntia stricta - 1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "
minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Eucalyptus melanophloia		
Acacia salicina		
Aristida personata		
Opuntia stricta		
Chloris truncata		
Eremophila debilis		
Cyanthillium cinereum		
Eragrostis brownii		
Panicum queenslandicum		
Wahlenbergia gracilis		
Sida cordifolia		
Glandularia aristigera		

VEGETATION PROFORMA

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Date:	14-Sep
Observers:	CT
Site name	18

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	10
Start point coordinate	469377 6932614			
End point coordinate	469277 6932607			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Gro
Height Range (m):	22-26	14-20	2-8	<
Av. Height (m):	24	17	6	
Cover (%):	See interecept data	15	10	8
	Eucalyptus tereticornis - D	*Eucalyptus tereticornis - D*	*Melaleuca irbyana - D*	*Themeda tr*
		Corymbia tessellaris - S	*Lophostemon suaveolens - S*	*Megathyrsus*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.9-10.27	Confirmed Regional Ecosystem:	12.9-10.27
Landform:		Sanstone flats	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Good condition - minimal weed cover	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Baccharis halimifolia <5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "e
minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
3	5.5		23	Minimum height of plants included in the transect table:	2
12.1	16.3		23		
26.5	39.3		25		
58.4	60.2		22	Intercept of EDL 0 - 50m:	
62.4	71.6		24		
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis		
Corymbia tessellaris		
Melaleuca irbyana		
Lophostemon suaveolens		
Themeda triandra		
Baccharis halimifolia		
Verbena litoralis		
Eragrostis brownii		
Juncus continuus		
Bothriochloa sp		
Panicum decompositum		
Imperata cylindrica		
Conyza bonariensis		
Gomphocarpus physocarpus		

VEGETATION PROFORMA

Date:	15-Sep
Observers:	CT
Site name	19

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length
Start point coordinate		455225 6940075	
End point coordinate		NA	
Photos (north south east west)		yes/no	Yes

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#
Height Range (m):	20-23	8-12	2-6
Av. Height (m):	21	10	5
Cover (%):	<5%	5	40
	Eucalyptus tereticornis - D	*Casuarina cunninghamiana - D*	*Melaleuca viminalis - D*
		Lophostemon suaveolens - C	*Lantana camara - C*
			Ficus opposita - S

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.			

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	
Landform:			Alluvial
Soils:			Sand
Structural formation (eg woodland, open-forest etc.:			Cleared woodland
Field Observations/ Notes (eg. Level of disturbance connectivity):			Highly disturbed - large amount of introduced specie
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):			Cardiospermum grandiflorur

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary
FROM	TO			
NA				Minimum height of plants included in the transect table:
				Intercept of EDL 0 - 50m:
				Intercept of EDL 50 -100m:
				Measured crown cover % of EDL 0 -100m:
				Structural formation

				Structural formation
				Conclusions/Notes

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	
Eucalyptus tereticornis	*Imperata cylindrica*	*Acac*
Casuarina cunninghamiana	*Lomandra longifolia*	*Alectr*
Melaleuca viminalis	*Cirsium vulgare*	*C*
Celtis sinensis	*Eustrephus latifolius*	*Atala*
Ricinus communis	*Maclura cochinchinensis*	
Lophostemon suaveolens	*Ipomoea carica*	
Grevillea robusta	*Cardiospermum grandiflorum*	
Bursaria spinosa	*Macroptilium lathyroides*	
Vachellia farnesiana	*Bothriochloa decipiens*	
Acacia maidenii	*Medicago polymorpha*	
	Ageratum houstonianum	
	Commelina diffusa	
	Malvastrum americanum	
	Neptunia gracilis	
	Asparagus africanus	

VEGETATION PROFORMA

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Date:	15-Sep
Observers:	CT
Site name	20

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	468379 6936376			
End point coordinate	468365 6936425			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	16-20	9-12	2-5	<1m
Av. Height (m):	18	10	4	
Cover (%):	5	See intercept	10	60
	Eucalyptus crebra. - D	*Melaleuca irbyana - D*	*Melaleuca irbyana - D*	*Cymbopogon refractus - C*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.3.18	Confirmed Regional Ecosystem:	12.3.18
Landform:		Alluvil plain	
Soils:		Sandy clay	
Structural formation (eg woodland, open-forest etc.:		Low forest	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Good condition remnant and meets TEC height. Signs if orevious logging of emergents	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 5%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
4.1	8.5		9	Minimum height of plants included in the transect table:	9-12
9.6	13.3		11		
10.3	15.5		10		
19.1	24.3		12	Intercept of EDL 0 - 50m:	
26.4	32.7		12		
34	37.4		9		
40.1	43.4		10	Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Melaleuca irbyana		
Lantana camara		
Cymbopogon refractus		
Eremophila debilis		
Dianella sp		
Lobelia purpurascens		
Poaceae sp		
Panicum sp		
Leptochloa sp		
Secamone elliptica		

VEGETATION PROFORMA

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Date:	15-Sep
Observers:	CT
Site name	21

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	468218 6936476			
End point coordinate	468183 6936505			
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated"
Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	5-6m		2-4 m	<1
Av. Height (m):	6		3	
Cover (%):	See interecept data		10	20
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	Melaleuca irbyana - D	NA	Melaleuca irbyana - D	Cymbopogon refractus - C
				Leptochloa sp - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Non rem 12.3.18
Landform:		Alluvial plain	
Soils:		Sandy clay	
Structural formation (eg woodland, open-forest etc.:		Low forest	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Previously cleared - low, dense regrowth	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):			

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	4.1		6	Minimum height of plants included in the transect table:	5
5.5	8.7		5		
9.3	11.4		6		
18.7	21.5		5	Intercept of EDL 0 - 50m:	
25.3	28.4		6		
35.1	39.7		6		
44.3	48,1		5	Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (<u>15-20 minute</u> random meander) (required for all sites):

Flora species	Flora species	Flora species
Melaleuca irbyana		
Cymbopogon refractus		
Leptochloa sp		
Cyperus gracilis		
Dianella sp		
Sporobolus creber		
Carex appressa		
Cyperus trinervis		
Eragrostis elongata		
Dinebra decipiens var decipiens		

VEGETATION PROFORMA

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Date:	15-Sep
Observers:	CT
Site name	22

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate				
End point coordinate				
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated"
Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):				<1m
Av. Height (m):				
Cover (%):				90
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	NA	NA	NA	*Juncus continuus* - C
				Cynodon dactylon - C
				Cyperus sp - C
				Eichhornia crassipes - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.8**	**Confirmed Regional Ecosystem:**	**12.3.8**
Landform:		**Alluvial plain**	
Soils:		**Clay**	
Structural formation (eg woodland, open-forest etc.:		**Wetland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Water hyancinth. NB accessed property only extended to edge of wetland which is currently dry. Therefore minimal plant ID for site.**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Eichhornia crassipes 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Juncus continnus		
Cypersu sp		
Cynodon dactylon		
Eichhornia crassipes		
Marseila hirsuta		
Leucaeana leucocephala - Incidental		

VEGETATION PROFORMA

Date:	16-Sep
Observers:	CT
Site name	23

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	456438 6939101			
End point coordinate				
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	13-15	6-9m	1-5 m	<1
Av. Height (m):	14	7	4	
Cover (%):	5-10%	10	20	40
	Eucalyptus moluccana - D	*Eucalyptus moluccana - D*	*Alectryon diversifolius - C*	*Carissa ovata - C*
			Melaleuca irbyana - C	*Cymbopogon refractus - C*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Regrowth RE 12.3.18
Landform:		Alluvial	
Soils:		Clay loam	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Previously cleared	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Opuntia stricta <1%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus moluccana	*Carissa ovata*	
Melaleuca irbyana	*Chloris divaricata*	
Alectryon diversifolius	*Jasminum didymum*	
Acacia salicina	*Cymbopogon refractus*	
Alstonia constricta	*Paspalidium caespitosum*	
Myoporum montanum	*Maireana microphylla*	
Vachellia farnesiana	*Eragrostis brownii*	
	Ancistrachne uncinulata	
	Eremophila debilis	
	Eustrephus latifolius	
	Opuntia stricta	
	Clematicissus opaca	
	Panicum effusum	
	Typha orientalis	

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	16-Sep
Observers:	CT
Site name	24

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50 m
Start point coordinate	456314 6938452			
End point coordinate	456317 6938408			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	18-25	8-14	1-2	<1
Av. Height (m):	22	10	1	
Cover (%):	See interecept data	5	5	70
	Eucalyptus moluccana - D	Eucalyptus moluccana - D	Carissa spinosum - C	Chloris divaricata - C
			Maireana microphylla - C	Panicum queenslandicum - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.3.3d	Confirmed Regional Ecosystem:	12.3.3d
Landform:		Alluvial plain	
Soils:		Clay loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Small patch with no mid storey/shrub layer but still meets remnant criteria	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		NA	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	7.3		19	Minimum height of plants included in the transect table:	18
19.5	28.5		23		
38.2	40.9		18		
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	NA
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus moluccana		
Carissa spinosum		
Maireana microphylla		
Chloris divaricata		
Panicum queenslandicum		
Megathyrsus maximus		
Sida sp		
Enchylaena tomentosa		
Gomphrena celasioides		
Eremophila debilis		
Cirsium vulgare		
Achyranthes aspera		
Amyema miquelii		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	16-Sep
Observers:	CT
Site name	25

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	458893 6937518			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	19-22	10-15	2-5	<1
Av. Height (m):	20	12	3	
Cover (%):	30	10	5	55
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Eucalyptus molucanna - D*	*Euclayptus molucanna - D*	*Eucalyptus molucanna - D*	*Chloris truncata - C*
			Melaleuca irbyana - S	*Eremophila debilis - C*
				Bothriochloa sp - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.3d**	**Confirmed Regional Ecosystem:**	**12.3.3d**
Landform:		**Alluvial floodplain**	
Soils:		**Clay loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Signs of selective clearing (cut stumps)**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Bryophyllum delagoense - 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (<u>15-20 minute</u> random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus moluccana		
Eucalyptus tereticorins		
Melaleuca irbyana		
Chloris truncata		
Bryophyllum delagoense		
Panicum queenslandicum		
Eremophila debilis		
Cyperus gracilis		
Bothriochloa sp		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	16-Sep
Observers:	CT
Site name	26

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	476681 6925260			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	15-18	8-12	2-5	<1
Av. Height (m):	17	10	3	
Cover (%):	25	10	10	40
	Corymbia citriodora - D	*Corymbia citriodora - D*	*Acacia disparrima - C*	*Cymbopogon refractus - C*
	Eucalyptus crebra - S	*Eucalyptus crebra - S*		*Lantana montevidensis - C*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.2/12.9-10.7**	**Confirmed Regional Ecosystem:**	**12.9-10.2**
Landform:		**Sandstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Evidence of selective clearing**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Opuntia tomemtosa - 1%, Lantana montevidensis - 5%, Lantana camara - 1%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora		
Acacia disparrima		
Opuntia tomentosa		
Alphitonia excelsa		
Breynia oblongifolia		
Allocasuarina sp		
Cymbopogon refractus		
Lantana montevidensis		
Aristida calycina		
Passiflora suberosa		
Stylosanthes scabra		

VEGETATION PROFORMA

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Integrating Community, Environment and Engineering

Date:	16-Sep
Observers:	CT
Site name	27

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	100m
Start point coordinate	476530 6925918			
End point coordinate	476533 6926022			
Photos (north south east west)		yes/no	Y	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	18-23	10-16	1-5	<1
Av. Height (m):	21	12	3	
Cover (%):	See interecept data	15	20	40
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Corymbia citriodora - D*	*Corymbia citriodora - D*	*Jacksonia scoparia - C*	*Cymbopogon refractus - C*
			Acacia fimbriata - C	*Aristida calycina - C*
			Alphitonia excelsa - C	*Lomandra multiflora - C*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.2/12.9-10.7**	**Confirmed Regional Ecosystem:**	**12.9-10.2**
Landform:		**Sandstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Signs of past selective logging**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lanatana montevidensis - 5%, Opuntia tomentosa 1%,**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
0	2.3		20	Minimum height of plants included in the transect table:	18
7	9.5		19		
13.5	16		22		
20.1	23.5		21	Intercept of EDL 0 - 50m:	
35.1	40		21		
48.1	51		22		
55.3	57.1		20	Intercept of EDL 50 -100m:	
61.1	68.2		19		
86.7	90.1		23	Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora		
Eucalyptus crebra		
Alphitonia excelsa		
Acacia fimbriata		
Exocarpos cupressiformis		
Cymbopogon refractus		
Lomandra multiflora		
Lantana montevidensis		
Aristida calycina		
Themeda triandra		
Eustrephus latifolius		
Cinnamomum camphora - Incidental		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	18-Sep
Observers:	CT
Site name	28

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	50m
Start point coordinate	See ArcGIS collector			
End point coordinate	See ArcGIS collector			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	16-20m	6-10m	2-4	<1
Av. Height (m):	17	8	3	
Cover (%):	See interecept data	20	10	60
	Corymbia citriodora - D	*Corymbia citriodora - D*	*Lantana camara - C*	*Cymbopogon refractus - D*
	Eucalyptus crebra - S		*Alphitonia excelsa - C*	*Aristida calycina - S*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.2**	**Confirmed Regional Ecosystem:**	
Landform:		**Sandstone hills**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Moderate condition - some selective clearing and weeds**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lantana montevidensis - 10%, Lantana camara - 5%**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
22.1	30.7		19	Minimum height of plants included in the transect table:	
46.6	49.4		18		
56.4	59		20		
67	74.9		19	Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora	*Cymbopogon refractus*	
Eucalyptus crebra	*Aristida calycina*	
Eucalyptus melanophloia	*Pterocaulon sp*	
Lantana camara	*Senecio sp*	
Lantana montevidensis	*Sida cordifolia*	
Alphitonia excelsa	*Sporobolus creber*	
	Gomphrena celasioides	
	Cirsium vulgare	
	Cynodon dactylon	
	Passiflora suberosa	
	Heteropogon contortus	
	Lomandra multiflora	
	Rhynchosia minima	
	Melinis repens	
	Imperata cylindrica	

VEGETATION PROFORMA

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Integrating Community, Environment and Engineering

Date:	18-Sep
Observers:	CT
Site name	29

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	See collector			
End point coordinate	NA			
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	17-22m	10-14m	2-5m	<1
Av. Height (m):	20m	12	3m	
Cover (%):	20%	15%	5%	60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single	*Corymbia citriodora - D*	*Corymbia citriodora - D*	*Acacia salicina - C*	*Cymbopogon refractus - C*
		Eucalyptus crebra - C	*Brachychiton populneus - C*	*Lantana montevidensis - C*
		Corymbia tessellaris - S		*Heteropogon contortus - C*

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.9-10.2**	**Confirmed Regional Ecosystem:**	**12.9-10.2**
Landform:		**Sandstone hill ridgeline**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Woodland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Good condition**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		**Lanatana montevidensis - 10%,**	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Corymbia citriodora		
Eucalyptus crebra		
Acacia salicina		
Cymbopogon refractus		
Heteropogon contortus		
Passiflora suberosa		
Panicum queenslandicum		
Lantana montevidensis		

VEGETATION PROFORMA

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Date:	19-Sep
Observers:	CT
Site name	30

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	See ArcGIS collector			
End point coordinate	NA			
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	17-23m	10-14m	2-5m	<1
Av. Height (m):	20m	12	3m	
Cover (%):	20%	10%	20%	40%
	Eucalyptus tereticornis - D	*Corymbia tessellaris - C*	*Melaleuca viminalis - D*	*Cymbopogon refractus - C*
			Lantana camara - C	*Heteropogon contortus - C*
				Lomandra longifolia - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	12.9-10.17a	Confirmed Regional Ecosystem:	12.3.7
Landform:		Alluvial	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Sparse canopy and high level weed infestation. Moderate to poor condition	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		Lantana camara - 10%, Lantana montevidensis - 10%	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis	*Cymbopogon refractus*	
Corymbia tessellaris	*Heteropogon contortus*	
Lantana camara	*Lomandra longifolia*	
Acacia disparrima	*Cheilanthes sieberi*	
Petalostigma pubescens	*Aristida calycina*	
Alphitonia excelsa	*Lantana montevidensis*	
	Oxalis perennans	
	Chrysocephalum apiculatum	
	Melinis repens	
	Maclura cochinchinensis	
	Pteridium esculentum	
	Eustrephus latifolius	

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	19-Sep
Observers:	CT
Site name	31

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	See ArcGIS collector			
End point coordinate	NA			
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	NA	NA	NA	<1
Av. Height (m):				
Cover (%):				60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single				*Juncus continuus - D*
				Cynodon dactylon - C
				Cirsium vulgare - S
				Marsilea sp - C

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	**12.3.8**	**Confirmed Regional Ecosystem:**	**12.3.8**
Landform:		**Alluvial plain**	
Soils:		**Sandy loam**	
Structural formation (eg woodland, open-forest etc.:		**Wetland**	
Field Observations/ Notes (eg. Level of disturbance connectivity):		**Heavy grazing (horse), no water at time of survey. Minimal vegetation present due to dry conditions**	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):			

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
		Juncus continnus
		Marsilea sp
		Cirsium vulgare
		Cynodon dactylon

VEGETATION PROFORMA

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Date:	19-Sep
Observers:	CT
Site name	32

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	See ArcGIS collector			
End point coordinate	NA			
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	7-9	NA	2-4	<1
Av. Height (m):	10		3	
Cover (%):	10%		40%	40%
	Eucalyptus tereticornis - D	*NA*	*Melaleuca irbyana - D*	*Cymbopogon refractus - C*
				Sporobolus creber - C

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Regrowth 12.9-10.27
Landform:		Sandstone plains with impeded drainage	
Soils:		Sandy clay	
Structural formation (eg woodland, open-forest etc.:		Regrowth woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Previously cleared	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		NA	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus tereticornis		
Eucalyptus crebra		
Melaleuca irbyana		
Cymbopogon refractus		
Sporobolus creber		

VEGETATION PROFORMA

Future Freight
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Date:	19-Sep
Observers:	CT
Site name	33

Transect Details (required for all sites)

GPS coordinates:	Datum:		Transect Length	0m
Start point coordinate	See ArcGIS collector			
End point coordinate				
Photos (north south east west)		yes/no	Yes	

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	15-18m	8-14m	2-5m	<1
Av. Height (m):	16m	10	3m	
Cover (%):	5%	10%	20%	60%
	Eucalyptus crebra - D	*Eucalyptus crebra - D*	*Eucalyptus crebra - D*	*Cymbopogon refractus - D*
		Corymbia tessellaris -S		*Aristida calycina - C*

Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single

stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:	Non rem	Confirmed Regional Ecosystem:	Regrowth 12.9-10.7
Landform:		Sandstone plains	
Soils:		Sandy loam	
Structural formation (eg woodland, open-forest etc.:		Woodland	
Field Observations/ Notes (eg. Level of disturbance connectivity):		Previously cleared. Poor condition	
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):		NA	

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
NA				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	

				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (<u>15-20 minute</u> random meander) (required for all sites):

Flora species	Flora species	Flora species
Eucalyptus crebra		
Corymbia tessellaris		
Cymbopogon refractus		
Aristida calycina		

VEGETATION PROFORMA

Future Freight
Integrating Community, Environment and Engineering

Date:	
Observers:	**CT**
Site name	

Transect Details (required for all sites)

GPS coordinates:	**Datum:**		**Transect Length**	
Start point coordinate				
End point coordinate				
Photos (north south east west)		yes/no		

Note: If canopy is estimated (eg. No transect), provide only a single GPS point with a transect length of "0" and state "estimated" Complete Tables 1, 2 and 4 only.

Table 1: Estimated Canopy Cover (mandatory for all sites)

	Canopy/ Emergent	Tree 2	Shrub#	Ground
Height Range (m):	17-22m	10-14m	2-5m	<1
Av. Height (m):	20m	12	3m	
Cover (%):	20%	15%	5%	60%
Table notes: * use following terms: D = dominant; C = co-dominant; A = associated; S = suppressed. # Shrub is a woody plant <8m tall with multi- stems within 20cm from base or if single stemmed < 2m tall.				

Table 2

Mapped Regional Ecosystem:		**Confirmed Regional Ecosystem:**	
Landform:			
Soils:			
Structural formation (eg woodland, open-forest etc.:			
Field Observations/ Notes (eg. Level of disturbance connectivity):			
Weed species and approx. cover (%) (including restricted matters under the Qld Biosecurity Act 2016):			

Table 3: Canopy cover using Canopy Intercept method (use only if a transect has been

established – canopy "measured", not "estimated") A minimum of 1 measured canopy survey is required per representative Regional Ecosystem.

Interval (metres)		Intercept (m)	Str./height	Summary	
FROM	TO				
				Minimum height of plants included in the transect table:	
				Intercept of EDL 0 - 50m:	
				Intercept of EDL 50 -100m:	
				Measured crown cover % of EDL 0 -100m:	
				Structural formation	
				Conclusions/Notes	

Table 4: Flora species Present (15-20 minute random meander) (required for all sites):

Flora species	Flora species	Flora species

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix J Completed fauna assessment proformas

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 1 (IRS1)
Date:	11/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	482279
Northing:	6917673
End Transect:	
Easting:	482332
Northing:	6917658
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	74m
Locality Description:	Creek bed and banks. Close proximity to property access road (unsealed)

VEGETATION (CT notes)

General Site Description:	Riparian habitat along creek, including bed, banks, riparian zone. Canopy dominated by *Casuarina cunninghamiana* with some emergent *E. tereticornis* . Some very large, old *E. tereticornis* in general vicinity. Sandy creek bed (coarse grained) with some surface rock. Some small, shallow pools persisting. Sandstone rock ledge with small overhang and a few very small crevices within the site. Severe infestation of Lantana (*L. camara and L. montevidensis*) along banks - some recent clearing for weed control. *Melaleuca vimminalis* the only flowering plant - occasional *M. vimminalis* along creek bed and banks.
Remnant/Non-remnant:	Remnant but disturbed, severely weed infested.
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Casuarina cunninghamiana; Eucalyptus tereticornis, Corymbia tesselaris*
Main weeds:	*Lantana camara; L. montevidensis; Aristolochia macrophylla*

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire:	0
Grazing:	1
Clearing:	1
Erosion:	2

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		4
Coarse woody debris (<10cm diameter)		3
Decorticating bark		1
Leaf litter (%)		40%
Bare ground (%)		40%
Grass (%)		0
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		7 (comprising >50% of site)
Surface rocks and / or Boulders		3
Wetlands (Y/N)		N
Weeds and non-native species (%)		70% (shrub layer)
Rock crevices		1
Flower abundance (%)		5%
Fruit abundance (%)		<5%
Water present (Y/N)		Y

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		
Koala	Known to occur in region	**Yes -** potential to occur within and adjacent riparian zone where suitable food tree species present.
Greater Glider	Potential to occur in region	**No**
Long-nosed Potoroo	Potential to occur in region	**No**
Spotted-tailed Quoll	Known to occur in region	**Marginal** - prefers rocky, hilly habitat but may utilise waterways for movement and foraging. No suitable den sites present.
Grey-headed Flying Fox	Known to occur in region	**Yes** - potential to utilise the site when Eucs etc in flower
Brush-tailed Rock-wallaby	Known to occur in region	**No**
Large-eared Pied Bat	Potential to occur in region	Potential foraging habitat - no roosting habitat
BIRDS		
Black-breasted Button-quail	Known to occur in region	**Marginal** - some potential to occur in proximity to creek where dense thickets of lantana occur throughout Euc woodland. Ideal habitat not present.
Red Goshawk	Potential to occur in region	Potential to occur - no nests present
Swift Parrot	Potential to occur in region	**No -** considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**Marginal -** found along watercourses, but needs an abundance of mistletoe which was lacking from the site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another important habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - site is lacking Allocasuarina species required for feeding and no suitable roost trees present.

Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site
Eastern Bristlebird	Potential to occur in region	**No -** site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No -** no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No -** no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - occurs in euc woodland habitats on rocky hills and slopes
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - site does not contain favoured habitat
Dunmall's Snake	Potential to occur in region	**No** - site does not contain favoured habitat
Tusked Frog	Known to occur in region	**No** - Unlikely as thought to need dense ground cover / leaf litter. Note: specific habitat requirements still not very well understood.

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during middle of the day. Fairly quiet - few birds calling. Hot, dry, sunny with a light breeze and no cloud cover.
Bandicoot diggings
Echidna scat
Striated pardalote calling, observed. Pardalote nests (multiple) in bank (photo)
Numerous macropod scats (wallaby and kangaroo)
Noisy miner
Australian magpie
Mudlark
Pied Butcherbird
Rainbow bee-eater
Laughing kookaburra
Torresian crow
Red-browed finch
Bar-shouldered dove
Red-backed Fairy-wren
White-throated honeyeater
Lewin's honeyeater

Scarlet honeyeater
White-eared honeyeater
Silvereye
Leaden Flycatcher
Varied sitella

3 x cameras + 2 SM2s deployed at stock dam near Site 1 x 2 nioghts (11/9 nd 12/9)

* Photos (directional) taken at start, mid-point and end of transect and throughout site

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 3 (IRS3)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	481164
Northing:	6918983
End Transect:	
Easting:	481246
Northing:	6918943
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	158-163m
Locality Description:	Steep, rocky remnant woodland approximately 30m from property access track.

VEGETATION (CT notes)

General Site Description:	Remnant patch of RE 12.9-10.2 observed as *C. citriodora* and *E. crebra* woodland on steep rocky slopes with shallow soils. The canopy layer was dominated by *C. citriodora* with some *E. crebra* . The sub-canopy was dominated by *Allocasuarina torulosa*. The shrub layer was sparse and the ground cover was also sparse and dry, but found to consist of a range of native grass species (see CT notes). The site was very steep and rocky with some small boulders. While some larger trees were present, no large hollows were observed within the site. A very small number of hollows <5cm diameter were identified in a couple of small stags. There was an abundance of coarse woody debris and occasional fallen logs (>10cm diameter). Scattered grass trees (Xanthorrhoea sp. were present and flowering, but no obvious use by local wildlife - ie. no schratch marks, chewings (gliders) or use by birds etc during the survey). No canopy trees were in flower at the time of the survey. Some arboreal termitaria were present (no nests in any). No scratch marks of koala, possum, glider etc were observed. Some wallaby scats present and distinct wildlife tracks (macropod tracks) present across the slope.
Remnant/Non-remnant:	Non-remnant, severely weed infested.
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia tesselaris*
Main weeds:	*Lantana camara*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	2
Clearing:	2
Erosion:	1 - gully erosion downslope of site

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	2

Fallen logs (>10cm diameter)	3
Coarse woody debris (<10cm diameter)	7
Decorticating bark	2
Leaf litter (%)	45%
Bare ground (%)	0%
Grass (%)	50% (but heavily grazed to ground level)
Soil Cracks	0
Soil Banks (eg. River banks/road cuttings etc)	0
Surface rocks and / or Boulders	2
Wetlands (Y/N)	N
Weeds and non-native species (%)	20% (mostly *Lantana camara*)
Rock crevices	0
Flower abundance (%)	<5%
Fruit abundance (%)	0%
Water present (Y/N)	N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Marginal** - *C. citriodora, E. crebra* and *C. tessellaris* known food trees, but no evidence of use.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**Marginal** -could potentially use the area for foragingl, but no suitable den sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may feed in the area when trees are in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - no suitable habitat present at this site
Large-eared Pied Bat	Potential to occur in region	**Marginal** - Potential foraging habitat - no roosting habitat.

BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - no emergent trees or suitable nesting habitat present
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another important habitat feature.
Glossy Black Cockatoo	Known to occur in region	**Yes** - Confirmed byseveral GBC chewings of *Allocasuarina torulosa* fruits.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable shelter available
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - no suitable shelter available
Dunmall's Snake	Potential to occur in region	**No** - no suitable shelter available
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during middle of the day (1.45pm). Fairly quiet - few birds calling. Hot, dry, sunny with a light breeze and no cloud cover.
Soils shallow with some surface rock present, including larger rocks to ~1m diameter (but mostly small rocks ~10-20cm diameter)
Limited shelter for ground-dwelling animals including reptiles and small mammals.

Heavily grazed - grasses chewed to ground level making identification of species quite difficult. Leaf litter fairly sparse and shrub layer very sparse.
Quite a few small to medium-sized terrestrial termitaria present and a couple of small stags.

Incidental sightings were of common species expected to occur in grazing lands / paddocks such as pied butcherbird, noisy miner, Australian magpie.
Other observations included:
Red-browed finch
Noisy miner
White-throated gerygone
Striated pardalote
Australian magpie
Mudlark
Pied Butcherbird
Laughing kookaburra
Pied currawong
Bar-shouldered dove
Red-backed Fairy-wren
White-throated honeyeater
Scarlet honeyeater
Varied sitella (group of ~6)
Rufous whistler
Little shrike-thrush
Speckled warbler
Willie wagtail
Black-faced cuckoo-shrike
Rainbow lorikeet

Bandicoot diggings present
One burrow (European hare) and hare scats

Numerous macropod scats (wallaby and kangaroo)
3 x cameras + 2 SM2s deployed at stock dam near Site 1 x 2 nioghts (11/9 nd 12/9)

* Photos (directional) taken at start, mid-point and end of transect and throughout site

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 3 (IRS3)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	481164
Northing:	6918983
End Transect:	
Easting:	481246
Northing:	6918943
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	158-163m
Locality Description:	Steep, rocky remnant woodland approximately 30m from property access track.

VEGETATION (CT notes)

General Site Description:	Remnant patch of RE 12.9-10.2 observed as *C. citriodora* and *E. crebra* woodland on steep rocky slopes with shallow soils. The canopy layer was dominated by *C. citriodora* with some *E. crebra* . The sub-canopy was dominated by *Allocasuarina torulosa*. The shrub layer was sparse and the ground cover was also sparse and dry, but found to consist of a range of native grass species (see CT notes). The site was very steep and rocky with some small boulders. While some larger trees were present, no large hollows were observed within the site. A very small number of hollows <5cm diameter were identified in a couple of small stags. There was an abundance of coarse woody debris and occasional fallen logs (>10cm diameter). Scattered grass trees (Xanthorrhoea sp. were present and flowering, but no obvious use by local wildlife - ie. no schratch marks, chewings (gliders) or use by birds etc during the survey). No canopy trees were in flower at the time of the survey. Some arboreal termitaria were present (no nests in any). No scratch marks of koala, possum, glider etc were observed. Some wallaby scats present and distinct wildlife tracks (macropod tracks) present across the slope.
Remnant/Non-remnant:	Remnant patch of RE 12.9-10.2
Structure:	Refer vegetation proformers veg descriptions, heights etc
Dominant species:	*Corymbia citriodora, E. crebra*
Main weeds:	*Lantana camara*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	1
Clearing:	0
Erosion:	0

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	2

Fallen logs (>10cm diameter)	3
Coarse woody debris (<10cm diameter)	7
Decorticating bark	2
Leaf litter (%)	45%
Bare ground (%)	0%
Grass (%)	50% (but heavily grazed to ground level)
Soil Cracks	0
Soil Banks (eg. River banks/road cuttings etc)	0
Surface rocks and / or Boulders	2
Wetlands (Y/N)	N
Weeds and non-native species (%)	20% (mostly *Lantana camara*)
Rock crevices	0
Flower abundance (%)	<5%
Fruit abundance (%)	0%
Water present (Y/N)	N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Marginal** - *C. citriodora, E. crebra* and *C. tessellaris* known food trees, but no evidence of use.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**Marginal** -could potentially use the area for foragingl, but no suitable den sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may feed in the area when trees are in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - no suitable habitat present at this site
Large-eared Pied Bat	Potential to occur in region	**Marginal** - Potential foraging habitat - no roosting habitat.

BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - no emergent trees or suitable nesting habitat present
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another important habitat feature.
Glossy Black Cockatoo	Known to occur in region	**Yes** - Confirmed byseveral GBC chewings of *Allocasuarina torulosa* fruits.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**Marginal** - prefers rocky outcrops, but some potentially suitable habitat is available. Shelter sites limited.
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils.
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken in the morning. Fairly quiet - o ly a few bird species calling. Warm, dry, sunny with a light breeze and no cloud cover.

Soils very shallow with some surface rock present, including larger rocks to ~1m diameter (but mostly small rocks ~10-20cm diameter)
Heavily grazed - grasses chewed to ground
level making identification of species quite
difficult. Leaf litter fairly sparse and shrub
layer very sparse.
Occasiona small to medium-sized terrestrial termitaria present and a couple of small stags.

Incidental sightings included:
Varied sitella
Torresian crow
Pied Butcherbird
Pied currawong

Bandicoot diggings present
One burrow (European hare) and hare scats
Numerous macropod scats (wallaby and kangaroo)

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 4 (IRS4)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	481831
Northing:	6918471
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	87m
Locality Description:	Adjacent to unsealed property acccess track in dry creek bed

VEGETATION (CT notes)

General Site Description:	Quaternary site - no transect. Riparian habitat dominated by *Casuarina cunninghamiana* with some very large old *E. tereticornis* and *C. tessellaris* . The shrub layed comprised of species such as *Melaleuca vimminalis* , which was in flower at the time of the survey and attracting many honeyeaters (mostly Brown Honeyeaters, Scarlet Honeyeaters and White-throated Honeyeaters). No water was present in this section of the creek bed, and there were some sections where the creek bed had a rocky substrate with some small sandstone ledges, while other areas were coarse-grained sand. A dense infestation of *L. camara* and *L. montevidensis* present along the creek banks. Evidence of a good flow during wet periods - trees washed over and a lot of debris up at least 3-4m (and higher) above the creek bed in places.
Remnant/Non-remnant:	Remnant patch of RE 12.3.7
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Casuarina cunninghamiana* with some *E. tereticornis* and *C. tesselaris*
Main weeds:	*Lantana camara, L. montevidensis, Aristolochia elegans*

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)
Fire:	0
Grazing:	1
Clearing:	1
Erosion:	1

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	2
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		3
Decorticating bark		1
Leaf litter (%)		20%
Bare ground (%)		0%
Grass (%)		<5%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		50% of site (in creek bed)
Surface rocks and / or Boulders		40%
Wetlands (Y/N)		N
Weeds and non-native species (%)		40% (mostly *Lantana camara, L. montevidensis*)
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Marginal** - *Some large E. tereticornis and C. tessellaris* (known food trees) along creek banks, but no evidence of use (no scratches, no pellets, bo sightings.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**Marginal** -could potentially use the area for foraging and movement along creekline, but no suitable den sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may feed in the area when larger trees are in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** no suitable habitat present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	nesting, but generally prefers larger watercourses and rivers for nesting. present
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.

Glossy Black Cockatoo	Known to occur in region	**Marginal** - Occasionally recorded feeding on *C. cunninghamiana* , but prefers Allocasurarina species where available. No evidence of GBC activity at this site.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat present at this site, prefers rocky outcrops.
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken mid morning (~10am). Warm, dry, sunny with a light breeze and no cloud cover.

Heavily grazed along creek banks - any grasses present chewed to ground level making identification of species difficult. Leaf litter fairly sparse and shrub dominated by weeds - Lantana species.

Canopy and sub-canopy has a moderate infestation of Dutchman's pipe (*Aristolochia elegans*)

Some larger rocks along the sandstone creek bed and ledges - would provide good micro-habitat for a range of small reptiles (eg geckoes, skinks), but none found undewrneath any rocks during the survey

Incidental sightings included:
Eastern Whipbird
Scarlet Honeyeater
Brown Honeyeater
White-throated Honeyeater
Red-browed Finch
Torresian Crow
Rainbow Bee-eater
White-browed Scrub-wren

Numerous macropod scats (wallaby and kangaroo)

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 5 (IRS5)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	481613
Northing:	6917056
End Transect:	
Easting:	481605
Northing:	6917003
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	163m
Locality Description:	Ridgetop

VEGETATION (CT notes)

General Site Description:	Very steep, rocky habitat along the ridgetop, with some large boulders and crevices. No significant rock overhangs or cliffs present. Lophostemon confertus woodland with Corymbia citriodora and some Eucalyptus crebra. A lot of course woody debris and fallen logs present with quite a few hollows, and a good ground cover of grasses and native ground cover species. Soils very shallow.
Remnant/Non-remnant:	Remnant patch of RE 12.9-10.17
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Lophostemon confertus, Corymbia citriodora*
Main weeds:	*Lantana camara*

Habitat Disturbance		
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**	
Fire:	1	some old fire scars observed
Grazing:	1	

Clearing:	0
Erosion:	0

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	1
	>10, <15cm diameter	3
	>5, <10cm diamteter	3
	<5cm diameter	3
Fallen logs (>10cm diameter)		4
Coarse woody debris (<10cm diameter)		3
Decorticating bark		3
Leaf litter (%)		20%
Bare ground (%)		5%
Grass (%)		20%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0%
Surface rocks and / or Boulders		6
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		5
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		

Koala	Known to occur in region	**Yes -** Canopy species are known food trees (but no evidence of use)
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**Yes** -suitable habitat present for denning and foraging.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may feed in the area when larger trees are in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** site does not contain cliffs and rocky overhangs etc needed by this species for shelter.
Large-eared Pied Bat	Potential to occur in region	**No -** no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No -** species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No -** considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No -** no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No -** site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No -** no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No -** no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**Yes** - Rocky outcrops and crevices provide good habitat for this species.
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during the middle of the day. Hot, dry, sunny with a very light breeze and no cloud cover.

Some evidence of light grazing throughout the site. Leaf litter and grass cover fairly sparse. Some native vines present - *Smilax australis, Eustrephus latifolius*
Canopy and sub-canopy has a moderate infestation of Dutchman's pipe (*Aristolochia elegans*)
Some larger rocks along the sandstone creek bed and ledges - would provide good micro-habitat for a range of small reptiles (eg geckoes, skinks), but none found undewrneath any rocks during the survey
Of the EVNT's, the Spotted-tailed Quoll is considered most likely to occur in this area, as there is suitable habitat present for denning and foraging purposes.

Incidental sightings included:
Noisy Miner
Brushtail possum scats collected
Wall skink

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 6 (IRS6)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	480482
Northing:	6919520
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	186m
Locality Description:	Non-remnant area adjacent to small stock dam

VEGETATION (CT notes)

General Site Description:	Quaternary assessment - no transect. Non-remnant area with some young regrowth (*C. tessellaris*) to 10m high on banks of the dam and down the creek line behind the dam. The surrounding area has been cleared and heavily grazed.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia tessellaris* the main regrowth species.
Main weeds:	*Lantana camara, Senecio madagascariensis (fireweed)* - check species with CT

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	3
Clearing:	3

Erosion:	1

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		1
Coarse woody debris (<10cm diameter)		0
Decorticating bark		1
Leaf litter (%)		10%
Bare ground (%)		10%
Grass (%)		75% (Grazed almost to ground level)
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		20% (Site located at the dam)
Surface rocks and / or Boulders		1
Wetlands (Y/N)		N
Weeds and non-native species (%)		20%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		Y (Stock dam half full)

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**No** - non-remnant vegetation comprising small, young regrowth trees only

Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**Marginal -** could potentially use the creek line behind the dam for movement purposes. Camera trap deployed in creek line.
Grey-headed Flying Fox	Known to occur in region	**No** - Vegetation comprises small, young regrowth trees only. Unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** site does not contain cliffs and rocky overhangs etc needed by this species for shelter.
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No -** critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists in the area
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during the mid afternoon. Very hot, dry, sunny with a very light breeze and no cloud cover. Few birds calling

Incidental sightings included:
Striated Pardalote
Leaden Flycatcher
Pied Butcherbird
Australasian Grebe
Masked Lapwing
Torresian Crow
Australian Magpie

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 7 (IRS7)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	480277
Northing:	6919395
End Transect:	
Easting:	480259
Northing:	6919439
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	212m
Locality Description:	Non-remnant area in proximity to farm house (~200m)

VEGETATION (CT notes)

General Site Description:	Non-remnant area with regrowth (*C. citriodora* and *E. crebra*) and occasional larger trees nearby. Site very dry. Shallow loamy soils with some surface rock. Sparse ground cover and leaf litter. Some occasional terrestrial termitaria. Very heavily grazed - grasses grazed to ground level making ID difficult. Very sparse shrub layer.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia citriodora* and Ironarks
Main weeds:	*Lantana camara*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	2

Clearing:	2
Erosion:	0

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		3
Decorticating bark		1
Leaf litter (%)		30%
Bare ground (%)		10%
Grass (%)		30% (Grazed almost to ground level)
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		5
Wetlands (Y/N)		N
Weeds and non-native species (%)		10%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Marginal** - non-remnant vegetation comprising mostly young regrowth trees. Site does not contain core habitat, but some larger suitable trees nearby.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - Non-remnant - unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during the mid afternoon. Very hot, dry, sunny with a very light breeze and no cloud cover. Few birds calling

Incidental sightings included:
Blue-faced Honeyeater

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 8 (IRS8)
Date:	12/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	479217
Northing:	6919953
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	152m
Locality Description:	Non-remnant woodland (TMR site)

VEGETATION (CT notes)

General Site Description:	Quaternary site only - no transect. Non-remnant area with regrowth (*C. citriodora* and *E. crebra*) and occasional larger trees. Site very dry. Very shallow loamy soils with some surface rock present, including some small rock ledges. Sparse ground cover and leaf litter. Some large terrestrial termitaria. Very sparse shrub layer.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia citriodora* and Ironarks
Main weeds:	*Lantana camara*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	1

Clearing:	1
Erosion:	1

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	1
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		2
Decorticating bark		1
Leaf litter (%)		30%
Bare ground (%)		10%
Grass (%)		30% (Grazed. Very short and dry)
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		3
Wetlands (Y/N)		N
Weeds and non-native species (%)		10%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Marginal** - non-remnant vegetation. Site does not contain core habitat, but some larger suitable trees nearby. No evidence of koala activity.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - Non-remnant - unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken during the mid afternoon. Very hot, dry, sunny with a very light breeze and no cloud cover. Few birds calling

Incidental sightings included:

Rainbow Bee-eater
Torresian Crow
Leaden Flycatcher
Varied Sitella
Brown Honeyeater
Australian Magpie
Wall skink

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 9 (IRS9)
Date:	13/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	478035
Northing:	6920045
End Transect:	
Easting:	477938
Northing:	6920060
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	100-110m
Locality Description:	Washpool Road. Remnant vegetation - start transect approx. 50m from unsealed property driveway.

VEGETATION (CT notes)

Remnant woodland of RE 12.9-10.2 / 12.9-10.7 - *C. citriodora, E.crebra.* Site sloping, dry. More ground cover than previous sites - lighter grazing. Stock dam/s on and adjacent to property - inaccessible during survey. On adjacent property, stock dam had water, but levels were low and a lot of vegetation cover (reeds etc). Occasional terrestrial termitaria. quite a few hollow logs and fallen woody debris throughout site.

General Site Description:	Site surrounded by cleared, non-remnant farm lands.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia citriodora* and Ironarks
Main weeds:	*Lantana camara* and some weedy ground covers

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0

Grazing:	0	
Clearing:	1	Selective clearing
Erosion:	1	Around rabbit burrows

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	3
	>15, <30cm diamteter	1
	>10, <15cm diameter	1
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		2
Decorticating bark		4
Leaf litter (%)		15%
Bare ground (%)		10% (Mostly old stock and wildlife (macropod) tracks)
Grass (%)		70%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		15-20%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		Y (In stock dams but not accessible during survey)

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Marginal -** Site contains known food trees, but no evidence of koala activity. Patch is small and fragmented
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - Non-remnant - unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No -** critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No -** no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken mid morning (10am). Warm, dry, sunny with a very light breeze and no cloud cover.
Insect and inverterate activity much higher on this site, probably due to a denser ground cover and shrub layer (spiders, grasshoppers, cicadas, crickets, cockroaches, beetles and moths)
Noteworthy as invertebrate activity has been very low on all previous sites.

Incidental sightings included:

Rabbit burrows abundant throughout the site.
Noisy Miner
Wedge-tailed Eagle
Australian Magpie
Pied Butcherbird
Laughing Kookaburra
Straw-necked Ibis
Pale-headed Rosella
Rainbow Bee-eater
Wall skink
Bandicoot diggings
Small scratch marks consistent with Gliders (Squirrel Glider recorded by GHD)
Goanna scratch marks on large *C. citriodora tree*
Very old stags with some good hollows, couple of smaller stags

Deployed Song Meter at creek with water adjacent to Site 9.

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 10 (IRS10)
Date:	13/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	476703
Northing:	6922268
End Transect:	
Easting:	476667
Northing:	6922243
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	93-111m
Locality Description:	Off Washpool Road. Corner of property adjacent to alignment. Existing powerline easement through site.

VEGETATION (CT notes)

General Site Description:	Non-remnant patch with occasional remnant canopy trees and some regrowth (mostly *C. citriodora* and *E. crebra*). No shrub layer present. Some hollow logs and coarse woody debris. Some exposed surface rock with larger boulder upslope from the site, and very shallow soils. Heavily grazed - grasses grazed to ground level. Some large terrestrial termitaria.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia citriodora* and Ironarks
Main weeds:	*Lantana camara* and some weedy ground covers

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0

Grazing:	1
Clearing:	3
Erosion:	1

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	2
	>10, <15cm diameter	1
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		3
Coarse woody debris (<10cm diameter)		3
Decorticating bark		1
Leaf litter (%)		20%
Bare ground (%)		10%
Grass (%)		30%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		5
Wetlands (Y/N)		N
Weeds and non-native species (%)		10%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Marginal** - Some food trees present, but vegetation is sparse, non-remnant and heavily fragmented.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - Non-remnant - unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):
Survey undertaken late morning. Hot, dry, sunny with light cloud cover.

Incidental sightings included:

Pied Butcherbird
Straw-necked Ibis
Noisy Miner
Wallaby scats

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 11 (IRS11)
Date:	13/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	475750
Northing:	6923592
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	81m
Locality Description:	Off Washpool Road, close to farm house.

VEGETATION (CT notes)

General Site Description:	Quaternary assessment - no transect. Non-remnant woodland dominated by regrowth *C. citriodora* with some *E. crebra* (nearing remnant height). Selectively cleared, with no shrub layer and very sparse ground cover. Exposed surface rock with very shallow soils. Plenty of hollow logs and woody debris. Main grass species *Aristida personata* with some Barbed wire grass and *Eragrostis brownii.* Some low lying areas throughout property which would be inundated after a decent wet season.
Remnant/Non-remnant:	Non-remnant patch
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Corymbia citriodora* and Ironarks
Main weeds:	*Lantana camara* and some Pickly Pear (*Opuntia sp*)

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0

Grazing:	1	
Clearing:	2	Selective clearing with some log piles
Erosion:	0	

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	1
Fallen logs (>10cm diameter)		5
Coarse woody debris (<10cm diameter)		3
Decorticating bark		1
Leaf litter (%)		20%
Bare ground (%)		20%
Grass (%)		10%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		5
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Yes -** While the site is non-remnant, trees reaching remnant height. Food trees dominate area. Scratch marks recorded and koala pellets found.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - Non-remnant - unlikely to provide important feeding habitat. No suitable roost habitat present.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No -** no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken early afternoon. Hot, dry and sunny with a very light breeze and no cloud cover. Very little bird activity with the exception of common species expected within a non-remnant grazing landscape.
Abundance of terrestrial termitaria throughout the site.

Incidental sightings included:

White-breasted Woodswallow
Bearded Dragon
Brushtail Possum Scats
Koala Scats
Rabbit burrows
Striated Pardalote
Noisy Miner
Nesting Pied Butcherbird
A lot of macropod scats

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 12 (IRS12)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	462328
Northing:	6936278
End Transect:	
Easting:	462283
Northing:	6936274
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	66m
Locality Description:	Property off Paynes Road. House has been demolished and removed. Some tracks throughout property still accessible.

VEGETATION (CT notes)

General Site Description:	Remnant patch of RE 12.9-10.27 comprising *E. crebra / C. citriodora* woodland (formerly 12.9-10.11a). Incorrectly mapped - no *M. irbyana* understorey, but some isolated individual trees recorded. See CT notes. Site flat to gently undulating with sparse shrub layer and sparse ground layer. Small creek through site and small stock watering area. Some gully erosion present.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. crebra and Corymbia citriodora*
Main weeds:	Mother of Millions *(Bryophyllum sp.)*

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)	
Fire:	0	
Grazing:	1	
Clearing:	1	
Erosion:	1	Some gully erosion along drainage line.

Habitat Features - Abundance:		
Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	1
	>10, <15cm diameter	1
	>5, <10cm diamteter	0
	<5cm diameter	1
Fallen logs (>10cm diameter)		1
Coarse woody debris (<10cm diameter)		5
Decorticating bark		4
Leaf litter (%)		30%
Bare ground (%)		20%
Grass (%)		20%
Soil Cracks		1
Soil Banks (eg. River banks/road cuttings etc)		3
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		20%
Rock crevices		0
Flower abundance (%)		20% (C. citriodora in flower)
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		
Koala	Known to occur in region	**Yes** - One koala observed in tall *E. crebra* tree in close proximity to survey site. Location: 462240; 6936359. Numerous pellets and scratches found throughout site - well used area.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No -** considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No -** no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No -** site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No -** no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No -** no suitable habitat exists in the area

REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):
Survey undertaken mid morning. Warm, overcast morning with moderate winds.
Abundance of terrestrial termitaria and some arboreal termitaria throughout the site.

Incidental sightings included:

Koala!	462240	6936359
Koala Scats - throughout most of site		
Brushtail possum scats		
Glider scratches		
Noisy Miner		
Rainbow Lorikeets		
Pied Butcherbird		
Torresian Crow		
Red-necked Wallaby		
Echidna diggings		
Pale-headed Rosella		
Pardalote tunnels in gully banks		
Owl casts collected.		

Melaleuca irbyana	Easting	Northing
1 tree	461888	6936318
1 tree	461882	6936321
1 tree	461880	6936324

1 tree	461883	6936315
1 tree	461880	6936311
Clump (~ 30 trees)	461879	6936318

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 13 (IRS13)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	462164
Northing:	6936560
End Transect:	
Easting:	462072
Northing:	6936530
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	80m
Locality Description:	Property off Paynes Road.

VEGETATION (CT notes)

General Site Description:	Remnant woodland patch dominated by *E. crebra* with some *small C. tessellaris.* Site flat to gently undulating with sparse shrub layer and sparse ground layer.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. crebra and Corymbia tessellaris*
Main weeds:	Mother of Millions *(Bryophyllum sp.),* also *Lantana camara* and *Opuntia sp.*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0

Grazing:	1	
Clearing:	1	Some clearing evident along fence line.
Erosion:	0	

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	1
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	1
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		1
Decorticating bark		1
Leaf litter (%)		40%
Bare ground (%)		10%
Grass (%)		20%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		20%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Yes** - One koala observed in close proximity to survey site in tall *E. crebra* tree. Location: 462194; 6936524. Numerous pellets and scratches found throughout site - well used area.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No -** No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No -** considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No -** no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No -** site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No -** no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No -** no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken mid morning. Warm, overcast, windy morning. Very light rain in the early morning (0.2mm recorded from Amberley Weather Station)

Abundance of terrestrial termitaria and some arboreal termitaria throughout the site.

Incidental sightings included:

Koala!
Eastern Grey Kangaroo
Red-necked Wallaby
Noisy Miner
Laughing Kookaburra
Torresian Crow
Wall skink
Grey Butcherbird

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 14 (IRS14)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	462269
Northing:	6936847
End Transect:	
Easting:	462280
Northing:	6936797
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	78m
Locality Description:	Property off Paynes Road.

VEGETATION (CT notes)

General Site Description:	Remnant patch of RE 12.9-10.27. *M. irbyana* with *E. crebra* emergents. Very sparse ground cover with a lot of bare ground. Some coarse woody debris on the ground - potentially suitable microhabitat for some reptile and small mammals species. Some vines occurring throughout the patch eg. Monkey Rope Vine (*Parsonsia sp*). Ozothamnus diosmifolius common in the sparse shrub layer - flowering at the time of the survey.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*Melaleuca irbyana with emergent E. crebra*
Main weeds:	Mother of Millions *(Bryophyllum sp.)* and *Opuntia sp.*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0

Grazing:	1	
Clearing:	0	Some clearing evident along fence line.
Erosion:	0	

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	1
Fallen logs (>10cm diameter)		5
Coarse woody debris (<10cm diameter)		6
Decorticating bark		2
Leaf litter (%)		20%
Bare ground (%)		40%
Grass (%)		20%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		10%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Marginal** - koalas confirmed within the property, and emergent trees are known food trees, but these trees are sparse, and this RE is not considered to be core habitat.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken late morning. Warm, overcast, windy morning. Very light rain in the early morning (0.2mm recorded from Amberley Weather Station)

Incidental sightings included:

Dead cane toad
Eastern Grey Kangaroo
Brushtail possum scats
Echidna diggings in terrestrial termitaria
European hare observed and hare scats throughout.
Bandicoot diggings

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 15 (IRS15)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	463524
Northing:	6936587
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	69m
Locality Description:	Property off Paynes Road (Kelpie accompanied site).

VEGETATION (CT notes)

General Site Description:	No transect undertaken - site has been heavily cleared with the exception of small stands of *M. irbyana* and occasional canopy trees. Each *M. irbyana* tree or distinct clump of *M. irbyana* recorded with hand held GPS. Details below.
Remnant/Non-remnant:	Non-remnant
Structure:	
Dominant species:	*Melaleuca irbyana* within a non-remnant area.
Main weeds:	

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	0
Clearing:	0
Erosion:	0

*** No detailed assessment undertaken - see above**

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		0
Coarse woody debris (<10cm diameter)		0
Decorticating bark		0
Leaf litter (%)		0%
Bare ground (%)		0%
Grass (%)		0%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		0%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		Y

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		

Koala	Known to occur in region	**Marginal** - koalas confirmed in close proximity to the property, and some canopy (food) trees present. The species could use the area on occasion.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Melaleuca irbyana records:

Description	Easting	Northing
Tree	463528	6936474
Tree	463525	6936433
Tree	463464	6936424
Tree	463444	6936386
Tree	463448	6936381
Tree	463474	6936358
Tree	463526	6936374
Tree	463372	6936603
Tree	463380	6936607
Tree	463404	6936639
Tree	463417	6936765
Tree	463405	6936764
Tree	463464	6936738
Tree	463457	6936624
Tree	463473	6936593
Tree	463478	6936594
Tree	463577	6936610
Clump (86 plants)	463394	6936511
Clump (17 plants)	463392	6936544
Clump (4 plants)	463377	6936543
Clump (2 plants)	463354	6936539

Clump (8 plants)	463354	6936559
Clump (2 plants)	463366	6936568
Clump (4 plants)	463358	6936583
Clump (11 plants)	463364	6936593
Clump (3 plants)	463425	6936688
Clump (4 plants)	463408	6936734

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 16 (IRS16)
Date:	15/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	462903
Northing:	6936597
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	66m
Locality Description:	Property off Paynes Road.

VEGETATION (CT notes)

General Site Description:	Quaternary assessment - no transect Remnant patch of RE 12.9-10.7. *E. crebra / C. citriodora woodland* Very sparse ground cover with a lot of bare ground. Some coarse woody debris on the ground. Occasional terrestrial termitaria. Small drainage lines with some erosion present. Some *C. citriodora* just finishing flowering.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. crebra / C. citriodora*
Main weeds:	Mother of Millions *(Bryophyllum sp.)* and *Opuntia sp.*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	1

Clearing:	1	Selective clearing throguhout site
Erosion:	1	Some gully erosion

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	1
	>5, <10cm diamteter	0
	<5cm diameter	1
Fallen logs (>10cm diameter)		6
Coarse woody debris (<10cm diameter)		5
Decorticating bark		2
Leaf litter (%)		10-15%
Bare ground (%)		10%
Grass (%)		20%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		2
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		10%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N (Stock dam ~ 500m away)

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Yes** - Dead koala identified within the site. Scats also found. (possibly dog attack)
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):
Survey undertaken late morning. Warm windy conditions.

Incidental sightings included:
Brushtail possum scats
Glider scratches observed
Laughing Kookaburra
Noisy Miner
Pied Butcherbird
Australian Wood duck
Bar-shouldered Dove
Australian Magpie

Melaleuca irbyana (Clump of 16 plants) 462886; 6936527

* A lot of rubbish throughout site - old tyres, buckets etc

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 17 (IRS17)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	462918
Northing:	6936694
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	65m
Locality Description:	Property off Paynes Road.

VEGETATION (CT notes)

	Quaternary assessment - no transect Mapped as 12.9-10.27. Incorrect mapping - Onground community is remnant patch of RE 12.9-10.7. *E. crebra / C. citriodora* woodland with occasional *E. tereticornis* Very sparse ground cover with a lot of bare ground. Some coarse woody debris on the ground.
General Site Description:	Occasional terrestrial termitaria.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. crebra / C. citriodora*
Main weeds:	Mother of Millions *(Bryophyllum sp.)* and *Opuntia sp.*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	1

Clearing:	1	Selective clearing throguhout site
Erosion:	0-1	

Habitat Features - Abundance:

Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	1
Fallen logs (>10cm diameter)		4
Coarse woody debris (<10cm diameter)		5
Decorticating bark		1
Leaf litter (%)		15%
Bare ground (%)		15%
Grass (%)		15-20%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		

Koala	Known to occur in region	**Yes** - Dead koala identified within the property (Site 16). Scats also found.
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):
Survey undertaken early afternoon. Warm windy conditions.

Incidental sightings included:

Rainbow lorikeet
Nisy Miner
Pied Butcherbird
Laughing Kookaburra
European Hare
Echidna diggings (in terrestrial termitaria)
Kingfisher nest in arboreal termitaria

Koala scats: 462948; 6936696

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 18 (IRS18)
Date:	14/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	469377
Northing:	6932614
End Transect:	
Easting:	469277
Northing:	6932607
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	44m
Locality Description:	Off Middle Road, back of property - no road access.

VEGETATION (CT notes)

General Site Description:	Mapped as 12.9-10.27 *E. tereticornis* woodland with *E. crebra* and understorey of *M. irbyana*. Gilgai throughout. Would be inundated during wet season. Dense ground cover of native grasses and ground cover species including *Themeda triandra, Dianella caerulea* .Very tall canopy and emergent trees (average 24m height) but not very old (quite tall and thin, with no significant large hollows). Cracking clay soils - large cracks observed throughout.
Remnant/Non-remnant:	Remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. tereticornis, E crebra* woodland with *M. irbyana understorey*
Main weeds:	Groundsel bush

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	0

Clearing:	0
Erosion:	0

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	1
Fallen logs (>10cm diameter)		3
Coarse woody debris (<10cm diameter)		1
Decorticating bark		5
Leaf litter (%)		10%
Bare ground (%)		5%
Grass (%)		75%
Soil Cracks		3
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		

Koala	Known to occur in region	**Yes -** Canopy species are known food trees. However, patch is fragmented - surrounded by cleared grazing lands.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No -** no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No -** no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):
Survey undertaken early afternoon. Warm windy conditions.

Incidental sightings included:

Eastern grey kangaroo (large mob)
Possum and glider scratch marks abundant
Crinea sp (heard calling)
Rainbow Bee-eater
Australian Magpie
Rainbow Lorikeet
Mudlark
Noisy Miner
Scaly-breasted Lorikeet
Terrestrial termitaria with echidna diggings

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 19 (IRS19)
Date:	15/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	455225
Northing:	6940075
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	48m
Locality Description:	Lot 24 on CC158, adjacent to the existing rail line

VEGETATION (CT notes)

General Site Description:	Quaternary assessment - no transect Narrow, non-remnant riparian zone along creek throughout property. Some very large, old *E. tereticornis* along high bank of creek with some hollows and a lot of scratches (possum and glider) and occasional small *C. tessellaris* . Site has been heavily cleared for grazing with the exception of a few large trees along the creek bank. Some *Casuarina cunninghamiana* present along creek. Some flowering *Melaleuca vimminalis* . Some native vines present such as Cockspur vine (*Maclura cochinchinensis*) and occasional native riparian shrub layer species such as sandpaper fig (*Ficus coronata*). Heavily grazed *Lomandra sp* . common along banks and aquiet a few weeds (eg thistle). The creek had some deep pools persisting at the time of the survey, but not flowing. Creek banks very steep and high (~10m average). Remainder of the property flat to gently undulating.
Remnant/Non-remnant:	Non-remnant

Structure:	Refer CT notes for veg descriptions, heights etc
Dominant species:	*E. tereticornis* along the high bank. *C. cunninghamiana* in the creek.
Main weeds:	Asparagus vine, Thistle, see CT notes

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	3
Clearing:	3
Erosion:	2

Erosion severe

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	1
	<5cm diameter	0
Fallen logs (>10cm diameter)		1
Coarse woody debris (<10cm diameter)		1
Decorticating bark		1
Leaf litter (%)		10%
Bare ground (%)		10%
Grass (%)		75%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		5
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		0
Flower abundance (%)		10%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Marginal -** Canopy species are known food trees. Old Koala scratches identified on large E. tereticornis trees. However, patch is heavily disturbed and fragmented - surrounded by cleared grazing lands.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No -** critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.

Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No -** site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No -** no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No -** no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No -** no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken early morning. A lot of fog early in the morning and quite cold (~10 degrees at 7:30am) and windy.
NOTE: 15/09/17 recorded the coldest 9am temperature of the month (16.2) at Amberley Weather Station (040004) and equalled the highest 9am wind speed for the month (33km/hr) from the SSW.

Incidental sightings included:

Brown Honeyeater
White-throated gerygone
Mistletoebird
Scarlet honeyeater
Yellow thornbill
Double-barred finch
Laughing Kookaburra

Pale-headed Rosella
Rainbow lorikeet
King parrot
Australian Magpie (and nest)
Silvereye
Striated pardalote
Torresian crow
Black-faced cuckoo-shrike
Noisy friarbird
Scaly-breasted lorikeet
White-throated honeyeater
Yellow-faced honeyeater
Superb fairy-wren
Galah
Pied Butcherbird

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 20 (IRS20)
Date:	15/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	468379
Northing:	6936376
End Transect:	
Easting:	468365
Northing:	6936425
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	45m
Locality Description:	Off Cunningham Highway

VEGETATION (CT notes)

General Site Description:	*Melaleuca irbyana* woodland (TEC) with occasional E. crebra emergents, surrounded by areas of regrowth *M. irbyana.* Sparse shrub layer - mostly young *M. irbyana,* and very sparse ground cover - some heavily grazed Lomandra sp. Dry sparse grasses. A lot of hollow logs and coarse woody debris present throughout the patch, and a lot of decorticating bark and loose bark on the ground. Would become inundated during the wet season. Quite a few terrestrial termitaria and occasional arboreal termitaria throughout site
Remnant/Non-remnant:	Remnant 12.3.18
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*M. irbyana*
Main weeds:	Occasional *Opuntia sp.*

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	2
Clearing:	0
Erosion:	0

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	0
	>10, <15cm diameter	2
	>5, <10cm diamteter	4
	<5cm diameter	5
Fallen logs (>10cm diameter)		7
Coarse woody debris (<10cm diameter)		7
Decorticating bark		6
Leaf litter (%)		10%
Bare ground (%)		10%
Grass (%)		40-50%
Soil Cracks		5
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		1
Wetlands (Y/N)		N
Weeds and non-native species (%)		<5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Yes -** Koala scats located underneath large, emergent E.crebra trees towards the edge of the patch. Note: food trees within the patch scarce.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may provide foraging habitat when canopy trees in flower.
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No -** critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No -** no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area

REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken middle of the day. Quite hot at the time of survey after a cold foggy morning (~10 degrees at 7:30am) and windy.

This patch is representative of the EPBC listed *M. irbyana* Threatened Ecological Community

Incidental sightings included:

Rainbow Bee-eater
Scarlet Honeyeater
Pied Butcherbird
Koala pellets under large E. crebra trees.
Wedge-tailed eagles (x3)
Macropod scats everywhere.

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 21 (IRS21)
Date:	15/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	468218
Northing:	6936476
End Transect:	
Easting:	468183
Northing:	6936505
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	50m
Locality Description:	Off Cunningham Highway

VEGETATION (CT notes)

General Site Description:	*Melaleuca irbyana* regrowth woodland with no emergents. Quite a lot of clearing evident - piles of cut logs throughout patch. No shrub layer with the exception of very occasional *M. irbyana* seedlings, and very sparse to no ground cover. No large logs or hollows. Recent and heavy grazing.
Remnant/Non-remnant:	Non-remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*M. irbyana*
Main weeds:	Occasional *Opuntia sp.*

Habitat Disturbance		
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**	
Fire:	0	
Grazing:	2	
Clearing:	3	All regrowth
Erosion:	0	

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		1
Coarse woody debris (<10cm diameter)		6
Decorticating bark		2
Leaf litter (%)		<5%
Bare ground (%)		85-90%
Grass (%)		<5%
Soil Cracks		2
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		1
Wetlands (Y/N)		N
Weeds and non-native species (%)		<5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**No** - No food trees present. All small regrowth
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - no suitable habitat present at this site
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another icore habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - no suitable habitat exists in the area
Australasian Bittern	Known to occur in region	**No** - no suitable habitat exists in the area
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - no suitable habitat exists within the site

Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Survey undertaken middle of the day. Quite hot at the time of survey after a cold foggy morning (~10 degrees at 7:30am) and windy.

Incidental sightings included:

Scarlet Honeyeater
Australian Magpie (heard calling)

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 22 (IRS22)
Date:	15/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	468379
Northing:	6936376
End Transect:	
Easting:	468365
Northing:	6936425
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	45m
Locality Description:	Lot 1 on RP28485 adjacent to Cunningham Highway

VEGETATION (CT notes)

General Site Description:	Northern extent of wetland community within Lot 1 on RP28485. Within this site, no surface water was persisteing at the time of the survey. Vegetation comprised dried Water Hyacinth (*Eichhornia crassipes*) and other plant material (likely *Cyperus sp* , but dried and difficult to identify). The area is used for cattle grazing, and a lot of fresh cattle droppings were observed through the site. An existing power easement dissects the site just to the north of the wetland. Plenty of surface water in the wetland on the adjacent property - numerous wetland bird species identified.
Remnant/Non-remnant:	Remnant 12.3.8
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	Wetland ground covers - hard to identify as dry at the time of survey
Main weeds:	

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**
Fire:	0
Grazing:	3
Clearing:	3
Erosion:	0

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		0
Coarse woody debris (<10cm diameter)		0
Decorticating bark		0
Leaf litter (%)		0%
Bare ground (%)		0%
Grass (%)		0%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		Y
Weeds and non-native species (%)		50%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**No** - core habitat is not present at this site
Greater Glider	Potential to occur in region	**No** - core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No** - core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**No** - No suitable denning sites present.
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another core habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**Yes** - suitable habitat exists on the adjacent property, and would likely exist when the site is inundated.

Australasian Bittern	Known to occur in region	**Yes -** suitable habitat exists on the adjacent property, and would likely exist when the site is inundated.
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No -** no suitable habitat exists within the site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

White-bellied Sea-eagle
Glossy Ibis
Straw-necked Ibis
Australian White Ibis
Jacana
Masked Lapwing
Banded Lapwing
Black Swan
Great Egret
Cattle Egret
Dusky Moorhen
Black Cormorant
Tern (species unknown)
White-necked Heron
White-faced Heron
Darter

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 23 (IRS23)
Date:	16/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	456438
Northing:	6939101
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	63m
Locality Description:	Off Haynes Road - Lot 22 on CH3150

VEGETATION (CT notes)

General Site Description:	Regrowth woodland comprising *E. moluccana* (14m average height) with some large emergent *E. moluccana* to 20m. Sparse to mid-dense shrub layer of *M. irbyana, Carissa spinosum*. Fairly sparse ground cover of grazed grasses and native species such as *Jasminum dididum*. Some small *M. irbyana* shrubs also scattered throughout. Soils were a grey clay-loam which in areas would be subject to inundation in the wet season. Some erosion was evident along small drainage lines. Occasional large terrestrial termitaria were present, and echidna diggings were observed. Quite a lot of mistletoe throughout the site. Farm dam had water at the time of the survey. Dam banks and shallows vegetated with *Typha sp* .
Remnant/Non-remnant:	Non-remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. moluccana, M. irbyana*
Main weeds:	

Habitat Disturbance		
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**	
Fire:	0	
Grazing:	2	
Clearing:	1	All regrowth but some large trees
Erosion:	1	Gully erosion in places

Habitat Features - Abundance:		
Characteristics		**Abundance (0-7*) or % within landscape**
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	0
	>10, <15cm diameter	1
	>5, <10cm diamteter	2
	<5cm diameter	1
Fallen logs (>10cm diameter)		4
Coarse woody debris (<10cm diameter)		5
Decorticating bark		6
Leaf litter (%)		10%
Bare ground (%)		30%
Grass (%)		20%
Soil Cracks		4
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		
Species	**Known to occur or potential to occur**	**Suitable Habitat Present (Yes / No / Marginal)**
MAMMALS		
Koala	Known to occur in region	**Yes -** vegetation is regrowth, but reaching remnant height, and *E. moluccana* is a known food tree. The habitat is fragmented, but could support koala.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may forage when Eucalypts are in flower
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another core habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging

Australian Painted Snipe	Known to occur in region	**No -** core habitat is not present at this site
Australasian Bittern	Known to occur in region	**No -** core habitat is not present at this site
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No -** core habitat is not present at this site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

White-browed Woodswallow
Masked Woodswallow
Black-faced Woodswallow
Superb Fairy-wren
Red-backed Fairy-wren
White-bellied Cuckoo-shrike
Australian Magpie
Noisy Miner
Willie Wagtail
Torresian Crow
Black-faced Cuckoo-shrike
Twhite-throated Gerygone
Barred Cuckoo-shrike (juvenile)
Pheasant Coucal
European Hare
Eastern Grey Kangaroo
Eastern Brown Snake (Sloughed Skin)

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 24 (IRS24)
Date:	16/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	456314
Northing:	6938452
End Transect:	
Easting:	456317
Northing:	6938408
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	60m
Locality Description:	Off Haynes Road - Lot 22 on CH3150

VEGETATION (CT notes)

General Site Description:	*Eucalyptus moluccana* woodland (cattle paddock), with a cleared (and heavily grazed) shrub layer and ground layer, but trees probably meet remnant height and cover (refer CT notes). This siute is immediately adjacent to a very narrow band of trees along a fenceline that would provide some connectivity to surrounding patches of vegetation. Occasional stags throughout the site and quite a few hollows.
Remnant/Non-remnant:	Non-remnant
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*E. moluccana* only
Main weeds:	

Habitat Disturbance	
Disturbance type	**Severity 0-3 (0=nil, 3=severe)**

Fire:	0	
Grazing:	3	
Clearing:	2	Canopy remnant. No shrub or ground layer
Erosion:	0	

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	1
	>10, <15cm diameter	2
	>5, <10cm diamteter	6
	<5cm diameter	6
Fallen logs (>10cm diameter)		3
Coarse woody debris (<10cm diameter)		2
Decorticating bark		5
Leaf litter (%)		10%
Bare ground (%)		15%
Grass (%)		30%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		0%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)

MAMMALS		
Koala	Known to occur in region	**Yes -** *E. moluccana* is a favoured food tree. Old scats found below large tree within the site.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No -** No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may forage when Eucalypts are in flower
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another core habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - core habitat is not present at this site
Australasian Bittern	Known to occur in region	**No** - core habitat is not present at this site
REPTILES/AMPHIBIANS		

Collared Delma	Potential to occur in region	**No** - core habitat is not present at this site
Three-toed Snake-tooth Skink	Potential to occur in region	**No** - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

Sulphur-crested cockatoo	
Spangled Drongo	
koala scats	456307; 6938447

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 25 (IRS25)
Date:	16/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	458893
Northing:	6937518
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	57m
Locality Description:	Off Hallam Road - Lot 261 on CH3159 and Lot 59 on SP272815

VEGETATION (CT notes)

General Site Description:	*Eucalyptus moluccana* woodland with occasional *E. tereticornis* on alluvial plain that is subject to regular inundation during the wet season. Discussion with the landholder identified that the site can be inundated with up to 6 feet of water when in flood, and that 2017 has been a particularly dry year in this region. Selective clearing has occurred throughout the patch, but still meets remnant status. A sparse sub-canopy was present and a sparse shrub layer. Soils within the site consisted of a grey clay loam with some cracks and gilgai present. A lot of small coarse woody debris was present and a few large hollow logs and stags.
Remnant/Non-remnant:	Remnant 12.3.3d
Structure:	Refer Cvegetation proformers for veg descriptions, heights etc
Dominant species:	*E. moluccana* with occasional *E. tereticornis*
Main weeds:	

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)	
Fire:	0	
Grazing:	3	Area is heavily grazed.
Clearing:	2	Selective clearing throughout the patch.
Erosion:	0	

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	1
	>15, <30cm diamteter	0
	>10, <15cm diameter	2
	>5, <10cm diamteter	3
	<5cm diameter	3
Fallen logs (>10cm diameter)		3
Coarse woody debris (<10cm diameter)		5
Decorticating bark		5
Leaf litter (%)		10%
Bare ground (%)		30%
Grass (%)		20%
Soil Cracks		1
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		0
Wetlands (Y/N)		N
Weeds and non-native species (%)		<5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potential to occur	Suitable Habitat Present (Yes / No / Marginal)
MAMMALS		
Koala	Known to occur in region	**Yes -** *E. moluccana* is a favoured food tree. Landholder has never seen a koala on site, but old scats found. Site is heavily fragmented - no connectivity to surrounding patches.
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may forage when Eucalypts are in flower
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site
BIRDS		
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site
Red Goshawk	Potential to occur in region	**No** - species nests in emergent canopy trees in close proximity to watercourses.
Swift Parrot	Potential to occur in region	**No** - considered very unlikely to occur in this region
Painted Honeyeater	Potential to occur in region	**No** - no core habitat present at this site
Regent Honeyeater	Potential to occur in region	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another core habitat feature.
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.
Southern Emu-wren	Known to occur in region	**No -** occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.
Eastern Bristlebird	Potential to occur in region	**No** - site lacking a dense heath or tussock understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - core habitat is not present at this site
Australasian Bittern	Known to occur in region	**No** - core habitat is not present at this site

REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in region	**No** - core habitat is not present at this site
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No -** no suitable habitat present at this site

Survey undertaken during the middle of the day. Very hot, dry and sunny. Light to medium breeze, and a lot of insect activity.
Very few birds calling.

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

Very large (>50) mob of eastern grey kangaroos observed on the adjacent property.
European Hare scats
Noisy Miner
Masked Woodswallow
Australian Magpie
Feral Pig scats
Koala scats

M. irbyana	Easting	Northing
Tree	458805	6937527
Tree	458800	6937524
Tree	458786	6937518
Tree	458790	6937522
Tree	458783	6937518
Tree	458778	6937521

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 26 (IRS26)
Date:	16/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	476681
Northing:	6925260
End Transect:	
Easting:	
Northing:	
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	122m
Locality Description:	Off Dwyers Road - southern corner of TMR Site on Lot 94 on SP157507

VEGETATION (CT notes)

General Site Description:	*Corymbia citriodora* woodland with *E. crebra* and some *C. tessellaris* . Trees within this patch tall, but not large (quite young) with no loarge hollows. A small pocket of young Allocasuarina littoralis identified within this site - no fruits present, and unlikely to support Glossy Black Cockatoos as the trees are too small / immature. A sparse shrub layer present consisting of species such as Alphitonia excelsa and some Acacia sp. A sparse ground layer with quite a lot of bare ground. Terrestrial termitaria common throughout the site and occasional arboreal termitaria present. Soils loamy and shallow with some surface rock
Remnant/Non-remnant:	Remnant 12.3.3d
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*C. citriodora* with some *E. crebra* and *C. tessellaris Lantana*
Main weeds:	*camara*

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)	
Fire:	0	
Grazing:	3	Area is heavily grazed.
Clearing:	1	Selective clearing has occurred.
Erosion:	0	

Habitat Features - Abundance:

Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	0
	>15, <30cm diamteter	1
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	1
Fallen logs (>10cm diameter)		2
Coarse woody debris (<10cm diameter)		5
Decorticating bark		1
Leaf litter (%)		20%
Bare ground (%)		30%
Grass (%)		5%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		0
Surface rocks and / or Boulders		1
Wetlands (Y/N)		N
Weeds and non-native species (%)		<5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna

Species	Known to occur or potent	Suitable Habitat Present (Yes / No / Marginal)	Previous record 10km	Previous record 5km
MAMMALS				
Koala	Known to occur in region	**Yes -** *C. citriodora* and *E. crebra* favoured food trees. However, no evidence of koala identified during the survey.		
Greater Glider	Potential to occur in regio	**No -** core habitat is not present at this site		
Long-nosed Potoroo	Potential to occur in regio	**No -** core habitat is not present at this site		
Spotted-tailed Quoll	Known to occur in region	**No** - No suitable denning sites present.		
Grey-headed Flying Fox	Known to occur in region	**Marginal** - may forage when Eucalypts are in flower		
Brush-tailed Rock-wallaby	Known to occur in region	**No -** core habitat is not present at this site		
Large-eared Pied Bat	Potential to occur in regio	**No** - no suitable habitat present at this site		
BIRDS				
Black-breasted Button-quail	Known to occur in region	**No -** no suitable habitat present at this site		
Red Goshawk	Potential to occur in regio	**No** - species nests in emergent canopy trees in close proximity to watercourses.		
Swift Parrot	Potential to occur in regio	**No** - considered very unlikely to occur in this region		
Painted Honeyeater	Potential to occur in regio	**No** - no core habitat present at this site		
Regent Honeyeater	Potential to occur in regio	**No** - critical habitat factors (feed trees such as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another core habitat feature.		
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.		
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all lacking within the site.		

		No - site lacking a dense heath or tussock
Eastern Bristlebird	Potential to occur in regio	understorey required for nesting and foraging
Australian Painted Snipe	Known to occur in region	**No** - core habitat is not present at this site
Australasian Bittern	Known to occur in region	**No** - core habitat is not present at this site
REPTILES/AMPHIBIANS		
Collared Delma	Potential to occur in regio	**No** - core habitat is not present at this site
		No - prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and
Three-toed Snake-tooth Skink	Potential to occur in regio	rotting logs.
		No - prefers floodplains with deep-cracking black clay
Dunmall's Snake	Potential to occur in regio	and clay-loam soils, all lacking from the site
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site

Survey undertaken during the mid afternoon. Very hot, dry and sunny. Light to medium breeze.
Very few birds calling.

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

Noisy Miner

* Song Meter deployed at this site.

FAUNA PROFORMA

SITE INFORMATION

Site Name:	Site 27 (IRS27)
Date:	16/09/2017
Observers:	LM; CT
Datum:	GDA94
Zone:	56
Start Transect:	
Easting:	476530
Northing:	6925918
End Transect:	
Easting:	476533
Northing:	6926022
Plot Centre:	
Easting:	
Northing:	
Accuracy:	
Altitude:	142m
Locality Description:	Off Dwyers Road - Middle section of TMR Site on Lot 94 on SP157507

VEGETATION (CT notes)

General Site Description:	*Corymbia citriodora* woodland with *E. crebra* and some *C. tessellaris* . Like Site 26, trees within this patch tall, but not large (quite young) with no large hollows. A sparse shrub layer present consisting of species such as *Alphitonia excelsa, Acacia fimbrosa, Jacksonia scoparia, Exocarpus sp* . A sparse ground layer with quite a lot of bare ground. Terrestrial termitaria common throughout the site and occasional arboreal termitaria present. Soils loamy and shallow with a lot of surface rock and boulders present. Drainage line adjacent to the site. Site very steep.
Remnant/Non-remnant:	Remnant 12.9-10.2
Structure:	Refer vegetation proformers for veg descriptions, heights etc
Dominant species:	*C. citriodora* with some *E. crebra* and *C. tessellaris* Occasional
Main weeds:	*Opuntia sp.*

Habitat Disturbance

Disturbance type	Severity 0-3 (0=nil, 3=severe)	
Fire:	1	A few very old fire scars evident
Grazing:	2	Area is heavily grazed.
Clearing:	0	Selective clearing has occurred.
Erosion:	0	

Habitat Features - Abundance:		
Characteristics		Abundance (0-7*) or % within landscape
Hollows in trees and stags	>30cm diameter	2
	>15, <30cm diamteter	0
	>10, <15cm diameter	0
	>5, <10cm diamteter	0
	<5cm diameter	0
Fallen logs (>10cm diameter)		7
Coarse woody debris (<10cm diameter)		5
Decorticating bark		2
Leaf litter (%)		20%
Bare ground (%)		30%
Grass (%)		5%
Soil Cracks		0
Soil Banks (eg. River banks/road cuttings etc)		1 (small gully / drainage line adjacent start of transect)
Surface rocks and / or Boulders		5
Wetlands (Y/N)		N
Weeds and non-native species (%)		<5%
Rock crevices		0
Flower abundance (%)		0%
Fruit abundance (%)		0%
Water present (Y/N)		N

* NOTES: 0=absent; 1=rare; 2=rare to occasional; 3=occasional; 4=occasional to common; 5=common; 6=common to abundant; 7=abundant
(rare= **1-2** features/site; rare to occasional= **3-5** features/site; occasional= **6-7** features/site; occasional to common= **8-9** features/site; common= **10-12** features/site; common to abundant= **13-15** features/site; abundant= **>15** features/site)*

Habitat Suitability for EVNT Fauna		

Species	Known to occur or potential to o	Suitable Habitat Present (Yes / No / Margina	Previous record 10km	Previous record 5km
Koala	Known to occur in region	**Yes -** *C. citriodora* and *E. crebra* favoured food trees. However, no evidence of koala identified during the survey.		
Greater Glider	Potential to occur in region	**No -** core habitat is not present at this site		
Long-nosed Potoroo	Potential to occur in region	**No -** core habitat is not present at this site		
Spotted-tailed Quoll	Known to occur in region	**Marginal** - Plenty of suitable denning sites present, and favours rocky slopes, but very sparse ground cover/shrub layer for shelter.		
Grey-headed Flying Fox	Known to occur in region	**Marginal -** may forage when Eucalypts are in flower		
Brush-tailed Rock-wallaby	Known to occur in region	**No** - core habitat is not present at this site		
Large-eared Pied Bat	Potential to occur in region	**No** - no suitable habitat present at this site		
BIRDS				
Black-breasted Button-quail	Known to occur in region	**No** - no suitable habitat present at this site		
Red Goshawk	Potential to occur in region	**No -** species nests in emergent canopy trees in close proximity to watercourses.		
Swift Parrot	Potential to occur in region	**No -** considered very unlikely to occur in this region		
Painted Honeyeater	Potential to occur in region	**No -** no core habitat present at this site		
Regent Honeyeater	Potential to occur in region	as yellow box, white box and Blakeley's Red Gum on which it is reliant) do not occur within the site. Lacking mistletoe - another		
Glossy Black Cockatoo	Known to occur in region	**No** - no food trees present. No large hollows for nesting.		
Southern Emu-wren	Known to occur in region	**No** - occurs in moist dense scrublands / heath with grass trees and tea tree vegetation - all		

		understorey required for nesting and		
Eastern Bristlebird	Potential to occur in region	foraging		
Australian Painted Snipe	Known to occur in region	**No -** core habitat is not present at this site		
Australasian Bittern	Known to occur in region	**No** - core habitat is not present at this site		
REPTILES/AMPHIBIANS				
Collared Delma	Potential to occur in region	**No -** core habitat is not present at this site		
Three-toed Snake-tooth Skink	Potential to occur in region	**No -** prefers rainforest and moist eucalypt forest, on loamy or sandy soils with loose soil, leaf litter and rotting logs.		
Dunmall's Snake	Potential to occur in region	**No** - prefers floodplains with deep-cracking black clay and clay-loam soils, all lacking		
Tusked Frog	Known to occur in region	**No** - no suitable habitat present at this site		

Survey undertaken during the mid afternoon. Very hot, dry and sunny. Windy
Very few birds calling.

Incidental Observations (sightings/scats/tracks/general notes and comments etc):

Incidental sightings included:

Noisy Miner
Rainbow Bee-eater
Striated Pardalote
Fox den
Den - looks like dingo / wild dog

* 3 cameras deployed at this site - baited with chicken frames
* Song meter deployed at this site.

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix K ARTC Environmental Offset Delivery Strategy QLD

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

INLAND RAIL

ENVIRONMENTAL OFFSET DELIVERY STRATEGY – QLD

ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

0-0000-903-EAP-00-ST-0001_1

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Glossary

Specific terms and acronyms used throughout this strategy are listed and described in the table below.

Term / Acronym / Abbreviation	Definition
Australian Rail Track Corporation (ARTC)	Australian Government-owned corporation tasked with developing a 10-Year program to implement Inland Rail.
Conditions of Approval	The Conditions of Approval include the Coordinator-General's Imposed Conditions and, the EPBC Act Conditions of Approval, and any other relevant State approvals.
Inland Rail (IR) Program	The Inland Rail Program encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba.
Environmental Offset	Environmental offsets are measures that benefit biodiversity by compensating for the residual adverse impacts elsewhere of an action, such as clearing for development.
Primary Approval Document	The term 'Primary Approval Document' is used throughout this Strategy to collectively refer to the Environmental Impact Statements for each of the Projects.
Queensland Projects	B2G, G2H, H2C and C2K
B2G	Border to Gowrie
BVG	Broad Vegetation Group
C2K	Calvert to Kagaru
DBMP	Direct Benefit Management Plan
DES	Department of Environment and Science (Qld)
DAWE	Department of Agriculture, Water and Environment (Cmwth)
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994 (Qld)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cmwth)
EO Act	*Environmental Offsets Act 2014* (Qld)
G2H	Gowrie to Helidon
H2C	Helidon to Calvert
km	Kilometres
K2ARB	Kagaru to Acacia Ridge and Bromelton
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	*Nature Conservation Act 1992* (Qld)
NSW	New South Wales
RE	Regional Ecosystem
SDPWO Act	*State Development and Public Works Organisation Act 1971 (Qld)*
SEQ	South East Queensland
QEOP	Queensland Environmental Offsets Policy
Qld	Queensland

Executive Summary

ARTC's Inland Rail Program will generate environmental offset obligations within Queensland across Commonwealth and State jurisdictions due to unavoidable significant residual impacts on Matters of National, State and Local Environmental Significance (MNES, MSES and MLES).

Within Queensland, the Inland Rail Program is divided into five separate projects: Border to Gowrie (B2G); Gowrie to Helidon (G2H); Helidon to Calvert (H2C); Calver to Kagaru (C2K) and Kagaru to Acacia Ridge and Bromelton (K2ARB). The B2G, G2H, H2C and C2K projects are being progressed through the Environmental Impact Statement (EIS) process where, in relation to environmental offsets, environmental impacts will be assessed, and those significant residual impacts on MNES, MSES and/or MLES will be determined and quantified.

The K2ARB project does not currently form part of the Environmental Offset Delivery Strategy – Qld (Strategy). Initial assessments on MNES, MSES and MLES for the K2ARB project indicate that significant residual impacts to MNES, MSES and MLES are unlikely. If a significant residual impact on MNES, MSES and/or MLES is identified, this Strategy will be amended to include the project.

Environmental impact assessments to date have informed the preparation of this overarching Strategy recognising that each project EIS is being delivered according to separate yet inter-related schedules. Consequently, this Strategy will remain dynamic while project-wide environmental impact information is further progressed and better understood.

The overarching offset strategy for the Inland Program is to deliver a strategic, primarily land-based, offset portfolio that will seek to deliver a conservation outcome that improves or maintains the viability of impacted MNES, MSES and/or MLES.

The purpose of this Strategy is to identify an appropriate offset strategy in response to project impacts on MNES, MSES and/or MLES which could not be otherwise avoided or minimised by the relevant Inland Rail projects for Queensland.

The primary aim of the Strategy will be to identify a portfolio of offset properties that have potential to meet MNES, MSES and/or MLES offset obligations that are strategically located in proximity to the future rail corridor (impact area) and demonstrate offset availability. The Strategy will also identify offset properties that preferentially adjoin protected area estates, conservation reserves and / or large intact remnants and/or are located within proximity to bioregional corridors. Ongoing land management will be conducted according to Offset Area Management Plans which will seek to maximise landscape conservation outcomes by increasing habitat quality and availability of vegetation communities and habitats, reducing threats (such as weeds, feral animals, fire and clearing)while providing improved habitat and connectivity for MNES, MSES and/or MLES species within the region.

A high-level desktop assessment has been undertaken with the aim of identifying potential strategic offset sites that can meet the environmental offset requirements, at a Commonwealth and State level, as they are currently understood. A combination of eight potential offset sites for the Brigalow Belt bioregion and eleven potential offset sites for South east Queensland bioregion have been identified as having potential to meet all of the project's MNES and a large proportion of MSES offset requirements (as summarised in Tables 2 and 3). These properties have been identified through applying desktop information.

The offset desktop analysis and selection of priority offset sites under this initial assessment demonstrate the availability of particular ecosystems and habitats in the chosen study area for the impacted species. It also demonstrates feasibility of offset co-location across a variety of Commonwealth and State Government prescribed matters. Subsequent steps to finalise offset sites will include landholder engagement, ground-truthing to validate presence of MNES and MSES, and habitat quality assessments to confirm total offset areas needed and habitat quality gains that can be achieved.

Offset area management will depend on the final offset portfolio. Offset management may include weed control, feral animal control, fire management and restoration/revegetation. These actions may be implemented by landholders, accredited community based not for profit conservation organisations, an established conservation management entity, or a government based or supported organisation or a combination of these. Ongoing management of the offset portfolio will seek to foster community engagement and collaboration while achieving offset objectives and conservation outcomes under enduring arrangements. This provides avenues for community engagement, education as well as training around environmental conservation and restoration.

Environmental offsets for Inland Rail's Queensland components will recognise the environmental offset framework and hierarchy developed under the *Environmental Offsets Act 2014* (Qld) (EO Act), while delivering co-located offsets for MNES under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Environmental Offsets Policy. Accordingly, those remaining residual impacts to MSES and MLES identified by the State and Local Governments, will be delivered in consultation with the Office of the Coordinator General (OCG) and the Department of Environment and Science (DES), the Department of Agriculture and Fisheries (DAF) and the Department of Natural Resources, Mines and Energy (DNRME) in consideration of the Queensland Environmental Offset Policy (QEOP).

1 Introduction

1.1 Inland Rail Program in Queensland

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane. The Inland Rail Program (Inland Rail) involves the design and construction of a new inland rail connection, about 1,700 kilometres (km) in length, between Melbourne and Brisbane. The Australian Rail Track Corporation (ARTC) is the proponent for Inland Rail.

Inland Rail has been divided into 13 separate projects, five of which are located in Queensland as described in Table 1 Qld Inland Rail Overview and illustrated in Figure 1. Four of these projects, being; Border to Gowrie (B2G), Gowrie to Helidon (G2H), Helidon to Calvert (H2C) and Calvert to Kagaru (C2K), are presently being assessed by the Queensland Coordinator-General under the *State Development and Public Works Organisation Act 1971* (SDPWO Act) as coordinated projects for which an EIS is required. These same four projects have also been referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and determined to be controlled actions. They are being assessed under the Bilateral Agreement between State and Commonwealth governments, and separate approvals from the Commonwealth Environment Minister will be required.

The fifth project, K2ARB, is an enhancement project, and works will be primarily located within the existing rail corridor. This project has made application to be considered as a coordinated project for assessment by the Queensland Coordinator-General under the SDPWO Act. While it is expected that no significant impacts would occur to MNES, the project is likely to be referred under the EPBC Act.

Based on current information, it is likely four coordinated projects (B2G, G2H, H2C and C2K) will require environmental offsets due to significant residual impacts on Commonwealth and State MNES and MSES. Collectively, these four coordinated projects are referred to as the Queensland projects Therefore, this strategy provides an assessment of these values, as they are currently understood, as well the offset framework relevant to offset regulation in Queensland, the proposed delivery options, and the proposed approach that ARTC will adopt for the Queensland projects.

1.2 Purpose

This Strategy is an overarching document that applies to the Queensland projects s and sets a high-level direction on how environmental offsets will be assessed and delivered. The Strategy demonstrates ARTC's commitment to delivering environmental offsets in accordance with relevant Commonwealth, State and Local Government (if applicable) offset requirements in a manner that allows for strategic alignment of the Queensland projects.

The coordination of offsets across the Queensland projects will deliver landscape scale outcomes and provide efficiencies in securing and managing offset sites. The Strategy outlines the proposed offset delivery pathway, the estimated biodiversity values required to be offset for each project based on impact assessments completed to date, and a preliminary offset portfolio feasibility assessment based on current offset assumptions. The Strategy is intended to set out a road map outlining future steps that will be taken to confirm and deliver environmental offsets for the Queensland projects of Inland Rail.

1.3 Scope

The scope of the Strategy incorporates:

Present (included in this Offset Strategy)

- An initial estimation of residual impacts on MNES and MSES based on current information as part of the Queensland project's EISs and offset requirements in response to those impacts
- Evaluation of the environmental offset frameworks applicable to Inland Rail in Queensland and available offset delivery options
- Preliminary identification of strategic offset sites that could be used to deliver the Queensland Project's offset obligations in order to demonstrate high-level offset strategy feasibility
- Detail the measures that will be implemented during different project phases to finalise and deliver the environmental offset requirements for the Queensland projects.

Medium term goals (prior to project approvals)

- Refinement and finalisation of environmental offset requirements for each project following additional field ecology surveys, refinement of significant impact assessments, and habitat quality assessments throughout the proposed alignment
- Outline a preferred offset delivery package for each relevant Inland Rail Queensland project and the justification for this approach
- Commencement of offset site negotiations including due diligence investigations
- Confirmation of suitable offset sites based on updated, field verified information and habitat quality assessments, including application of EPBC Act offsets assessment guide for MNES.

Considerations in the development of the offset delivery approach for the Queensland projects have included:

- Applicable legislative and policy requirements
- Staged nature of the Queensland projects and approvals
- Detailed design and construction phases
- The prescribed environmental matters at a Commonwealth, State and Local level, and extent of project significant, residual impacts
- Availability of viable offsets and opportunities to improve conservation outcomes including through co-location of offset values.

Further information on each Queensland project is provided in Table 1.

Table 1 Queensland Projects Overview

Queensland project	Overview	Applicable approvals & EPBC Act referral number (where relevant)
Border to Gowrie (B2G)	Consists of approximately 216.2 km of new single-track railway, consisting of: ▸ 7.0 km of standard gauge rail (1,435 mm) and ▸ 209.2 km of dual gauge rail (standard (1,435 mm) and narrow (1,067 mm) gauge). The B2G project will consist of approximately 145.0 km of new rail corridor and approximately 71.2 km of existing rail corridor. A preferred alignment has been confirmed and environmental and planning approval processes commenced.	Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2018/8165). Controlling provisions for threatened species and communities.
Gowrie to Helidon (G2H)	Approximately 28km in length comprising sections of new track and upgraded track. A tunnel is proposed which will be approximately 6km in length, 13 bridges and viaduct structure. The topography of the Great Dividing Range crossing from Gowrie on the Toowoomba plateau to Helidon in the Lockyer Valley provides significant challenges. The proposed corridor connects to the existing rail line, with tie-in points designed to enable the project to proceed independently of the Helidon to Calvert and the Qld/NSW Border to Gowrie Inland Rail Projects. The preferred alignment is generally contained within the corridor protected under the *Transport Planning and Coordination Act* 1994.	Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7882). Controlling provisions for threatened species and communities.
Helidon to Calvert (H2C)	Approximately 48km in length comprising sections of new track, upgraded tracks and tie-ins. New track goes through Gatton and the existing Gatton rail station, through Forest Hill and then deviates from the existing rail corridor to just north of Laidley Township. It then traverses east going through Little Liverpool Range (with steep topography) and on to Calvert. The preferred alignment is generally contained within the Gowrie to Grandchester Study corridor which was reserved as a future public passenger transport corridor.	Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7883). Controlling provisions for threatened species and communities.
Calvert to Kagaru (C2K)	Approximately 53km of new dual gauge track. Will provide access to major proposed industrial development at Ebenezer and at Bromelton. The project was previously referred to as Southern Freight Rail Corridor and the rail corridor gazetted for future rail investigations. The preferred alignment is largely contained within the Southern Freight Rail Corridor protected as future railway land.	Coordinated Project EIS under SDPWO Act and Bilateral assessment under the EPBC Act (2017/7944). Controlling provisions for threatened species and communities.

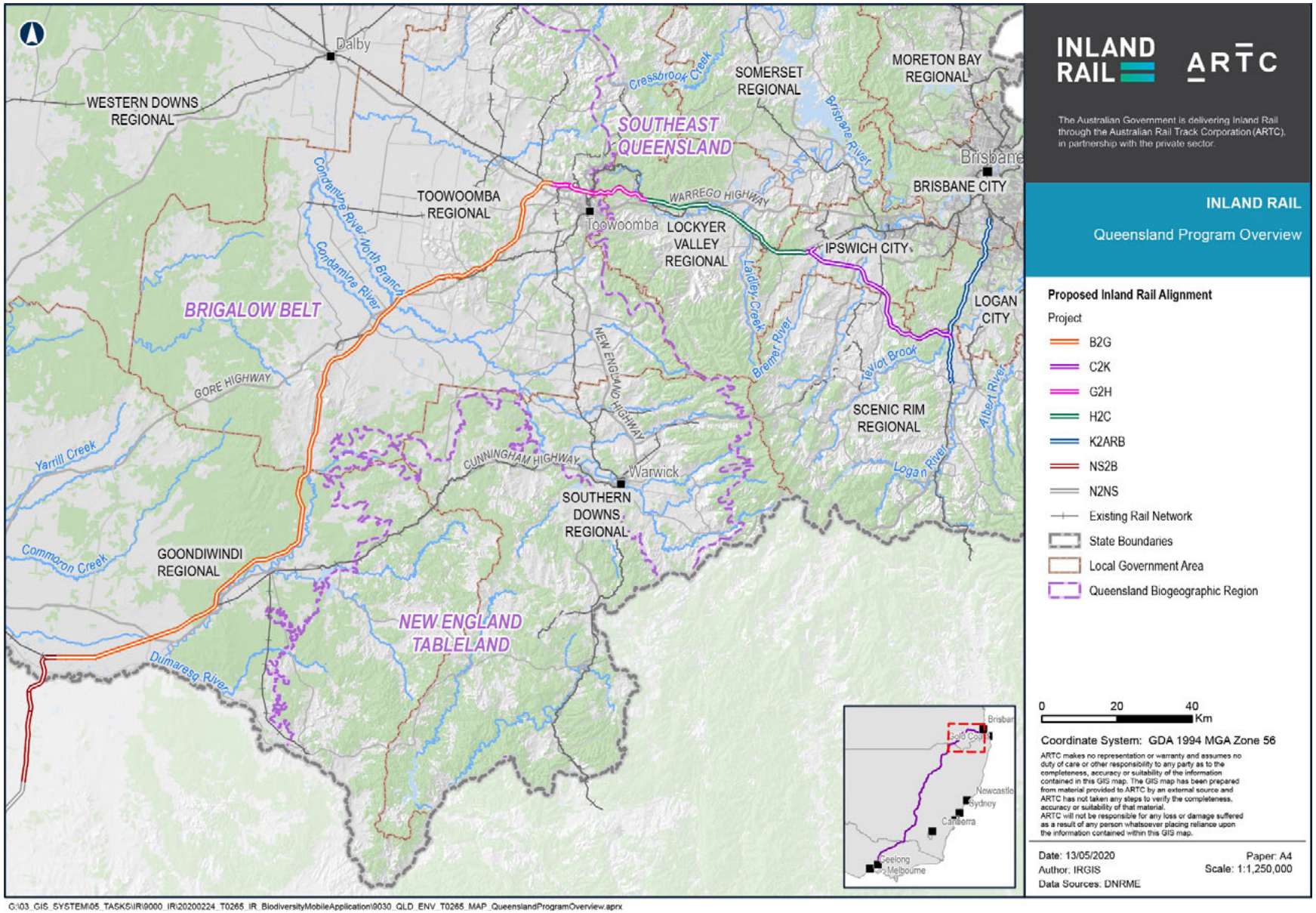

Figure 1 Inland Rail Project Location Overview for Queensland

2 Queensland offset legislative requirements and delivery options

The Queensland projects are being assessed and approved under both State and Commonwealth legislation including; EPBC Act and the SDPWO Act.

The following sections provide an overview of the Commonwealth and State environmental offset frameworks that will apply to the Queensland projects, and options available for the provision of environmental offsets.

2.1 Commonwealth

As part of the EIS process, ARTC will assess whether the Inland Rail Projects are likely to have a significant impact on MNES. If a significant residual impact is still predicted following the application of avoidance and mitigation measures, an environmental offset will be required to compensate for this loss. Offsets for significant residual impacts to MNES are determined and delivered in accordance with the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012).

The EPBC Act Environmental Offsets Policy may only be applied to those projects that are designated a controlled action under section 75 of the EPBC Act. The Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (the 'Significant Impact Guidelines') (DoE, 2013) will be applied to assess the significance of impacts to MNES. The Offsets Assessment Guide, which accompanies the EPBC Act Environmental Offsets Policy, has been developed in order to give effect to the requirements of that policy, utilising a balance sheet approach to measure impacts and offsets. It applies where the impacted protected matter is a threatened species or ecological community.

The Queensland Environmental Offsets Framework operates so that EPBC Act Environmental Offsets will take precedence over MSES and MLES, to avoid duplication of environmental offsets requirements. This allows a "packaging" approach to offsets to be adopted for MSES and MLES.

2.1.1 Matters of national environmental significance

The relevant controlling provisions subject to each EPBC Act referral decision for the Queensland projects are listed threatened species and ecological communities (sections 18 and 18A).

2.1.2 EPBC Act Offset Delivery Options

The EPBC Act Environmental Offsets Policy requires that offsets are built around direct, land-based solutions that protect and enhance threatened ecological communities and species habitats that are subject to significant residual impacts. At least 90% of a total offset requirement should deliver a conservation gain to the impacted MNES (i.e. like for like) through direct measures that are additional to what is already required, including improving condition of existing habitat and reducing threats or creating new habitat. The remaining 10% of an offset obligation can be indirect or supplementary measures that also relate to the impacted MNES such as research or threat abatement.

Deviation from the minimum of 90% direct offset requirement will only be considered where:

- It can be demonstrated that a greater benefit to the protected matter is likely to be achieved through increasing the proportion of other compensatory measures in an offsets package, or
- Scientific uncertainty is so high that it isn't possible to determine a direct offset that is likely to benefit the protected matter. For example, this can be the case in some poorly understood ecosystems in the Commonwealth marine environment (DSEWPaC, 2012)

All land-based offsets need to be legally secured for conservation purposes for at least the duration of the impact (which in this case will be perpetuity due to permanent nature of impacts). The offset land must be actively managed to improve ecological condition and provide a conservation gain for the impacted matter.

A conservation gain may be achieved by:

- Improving existing habitat for the protected matter
- Creating new habitat for the protected matter
- Reducing threats to the protected matter
- Increasing the values of a heritage place
- Averting the loss of a protected matter or its habitat that is under threat.

The offset must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. Offsets should align with conservation priorities for the impacted protected matter and be tailored specifically to the attribute of the protected matter that is impacted in order to deliver a conservation gain. For instance, if the proposed action is likely to have impacts on foraging habitat for a particular protected matter, then the offset should create, improve, protect and/or manage foraging habitat.

Offsets that deliver social, economic and/or environmental co-benefits will be encouraged.

The Department of Agriculture, Water and Environment (DAWE) require that an offset proposal is provided during the decision-making stage which is considered in deciding whether the proposed action should be approved. There are two key types of information utilised in planning an offset proposal – determining what types of activities would be appropriate as offsets for a given impact and determining the specific size and scope of an offsets package. Matters to be assessed include specific attributes of the protected matter at the impact site including quality of habitat, duration of the impact and matters at the offset site such as conservation gain to be achieved, land tenure, time to achieve the specified conservation gain, and suitability of the location of the offset site (DSEWPaC, 2012).

The offset proposal is one of many considerations that are weighed at the decision stage in determining the overall acceptability of the proposed action, including economic and social matters. If approved, offset requirements may be included as a condition of approval under section 134 of the EPBC Act.

2.2 Queensland

ARTC is committed to providing environmental offsets for significant residual impacts to MNES, and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

For a prescribed activity, an environmental offset may be required as a condition of approval where, following consideration of avoidance and mitigation measures, the activity is likely to result in a significant residual impact on a prescribed environmental matter. For Inland Rail, applicable prescribed environmental matters to be assessed are referred to as MSES and MLES and are defined in the *Environmental Offsets Regulation 2014* (EO Regulation).

To counterbalance this loss, offsets, which can include improvement and protection of alternative sites and/or actions that improve environmental viability, can provide a conservation outcome that is equivalent to the environmental value being lost at the impact site. If a state or local administering agency decides to impose an offset condition on an authority, the offset must be delivered in accordance with the Queensland environmental offsets framework.

There is potential for environmental offsets to be conditioned by the Coordinator-General under the Primary Approval, and subsequently under various secondary State approvals including; clearing permits under the *Nature Conservation Act 1992* (NC Act) for unavoidable impacts to threatened flora species, impacts to fish passage under *Fisheries Act 1994* and clearing of remnant vegetation under *Planning Act 2016*. All of these prescribed biodiversity matters will be assessed as part of the primary and secondary approval processes and the offset delivery requirements are governed by the Queensland environmental offset framework.

The framework consists of:

- EO Act
- EO Regulation
- Queensland Environmental Offsets Policy (QEOP) (Version 1.8) (DES, 2020)
- Queensland Environmental Offsets Policy - Significant, Residual Impact Guideline (DEHP, 2014).

Pursuant to QEOP, all Queensland offsets will have regard to the following seven offset principles:

1. Offsets will not replace or undermine existing environmental standards or regulatory requirements or be used to allow development in areas otherwise prohibited through legislation or policy
2. Impacts must first be avoided, then mitigated, before considering the use of offsets for any remaining impact
3. Offsets must achieve a conservation outcome that counterbalances the significant residual impact for which the offset was required
4. Offsets must provide environmental values as similar as possible to those being lost
5. Offset provision must minimise the time-lag between the impact and delivery of the offset
6. Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values
7. Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

2.2.1 Matters of state environmental significance

MSES are prescribed in Schedule 2 of the EO Regulation and include:

- Endangered and vulnerable flora and fauna species under NC Act and their habitats
- Special least concern fauna species under NC Act and their habitats
- Endangered and of concern REs under Vegetation Management Act 1999 (VM Act)
- Essential habitat (that has been mapped by DES)
- REs that intersect with wetlands and watercourses
- Connectivity areas for REs
- Wetlands in a wetland protection area, or of high ecological significance
- Wetlands or watercourses in high ecological value waters
- Protected areas (including nature refuges)
- Highly protected areas of a relevant Queensland marine park
- Marine plants within the meaning of the Fisheries Act 1994
- Declared fish habitat areas and waterways providing for fish passage
- Legally secured offset areas.

2.2.2 State Development and Public Works Organisation Act 1971

The Queensland projects are being assessed by the Coordinator-General as coordinated projects under the SDPWO Act. The EO Act does not affect or limit the functions or powers under the SDPWO Act of the Coordinator-General. In making decisions about environmental offset requirements under the SDPWO Act, the Coordinator-General may consider the environmental offsets framework but is not bound by its requirements.

To guide ARTC in how it will assess and identify a particular project's State environmental offset requirements, it is proposed the Queensland Environmental Offset Framework and overarching principles and delivery options will be considered, as outlined in the QEOP. However, given the size and scale of the Queensland projects, ARTC will seek a tailored offset delivery approach, in consultation with the Coordinator-General, in order to achieve a strategic offset settlement.

Qld Environmental Offsets Policy

Under the QEOP an offset may only be required where a prescribed activity is likely to result in a significant residual impact on a MSES. Two impact guidelines have been prepared by the State to support a determination as to whether an impact is 'significant' and therefore offsets required. The most applicable to Inland Rail is:

- The Queensland Environmental Offsets Policy: Significant Residual Impact Guideline which applies to development that requires an approval under *Environmental Protection Act 1994* (EP Act), *Nature Conservation Act 1992* (NC Act) or Marine Parks Act 2004 (DEHP, 2014).

While the guideline may not specifically apply to coordinated projects it will be used to support an assessment of whether impacts from the project are likely to be 'significant' and require offsetting. This guideline would be applicable for secondary approvals (where required) under NC Act and EP Act.

To avoid duplication of offset conditions between State and Commonwealth, the Queensland State and Local Governments can only impose an offset condition in relation to a prescribed activity, if the same, or substantially the same impact and the same, or substantially the same matter, has not been subject to assessment under the EPBC Act for a controlled action.

Therefore, when developing a preferred offset delivery approach for the Queensland projects, preference will be to identify a process and tailored approach that will ensure MNES offsets comply with the EPBC Act Environmental Offsets Policy, and any remaining MSES (not directly associated with MNES) will be assessed and delivered in general accordance with the QEOP.

State Offset Delivery Options

Under the QEOP offset requirements can be satisfied through one or a combination of options which include:

- Proponent driven offset (primarily land-based and/or delivery of actions in a Direct Benefit Management Plan (DBMP))
- Financial settlement offset or
- A combination of the above.

Proponent-driven offsets

Land-based offsets

- Like the EPBC Act Offset Policy, QEOP specifies direct land-based offsets should make up 90% or more of the total offset requirement, unless otherwise agreed
- Direct land-based offsets are to provide environmental values as similar as possible to those being lost and may consist of remnant or non-remnant vegetation
- Where remnant vegetation is used, management actions are required to demonstrate additional habitat quality outcomes can be achieved. For example, Endangered and Of Concern Regional Ecosystem (RE) offsets must be of the same Broad Vegetation Group (BVG) as the impacted RE, of the same RE status, and within the same bioregion
- For flora and fauna species, the offset must contain or be capable of containing a self-sustaining population of that same impacted species
- The size of a land-based offset is governed by a range of factors including the quality of habitat impacted. Offset site size is generally determined through use of the Land-based Offsets Multiplier Calculator, which is habitat quality based, or using a rapid assessment, which caps the offset at a ratio of 1:4 (impact site only). Rapid assessment assumes an impact site quality score of 7 out of 10 which may not accurately reflect the actual habitat quality of the impact site and may present challenges in fulfilling offset obligations on an offset site
- Site-based habitat quality assessments for both the impact and offset sites are highly recommended where time permits
- The offset site is preferably located in a strategic offset investment corridor closest to the impacted site, and risks of a conservation outcome not being achieved are identified and mitigated.

Direct Benefit Management Plan

- Proponent-driven offsets can also be delivered through priority actions identified in a Direct Benefit Management Plan (DBMP)
- DBMPs are pre-approved packaged investments that outline priority actions to address threats to and provide substantial benefits for prescribed matters.

Financial Settlement

- A financial settlement payment can be used to meet an offset requirement for any MSES impacted by a development
- The required payment is calculated by applying the Financial Settlement Offset Calculation Methodology set out in the QEOP
- A financial settlement must be paid prior to project commencement
- Financial payments are made up of costs associated with on-ground land management, administration and landholder incentive payment
- Financial payments can be staged. The staging of offset delivery will need to be described and approved in an Offset Delivery Plan prior to project commencement.

3 Queensland Environmental Offset Requirements

Environmental impact assessments are being prepared for all Queensland projects. To date, there has been a range of targeted ecological surveys completed within the corridor to inform each Project's draft EIS. The assessments have included threatened species habitat modelling, informed by initial field ecology survey results, to predict habitat extent, disturbance and offset obligation.

For the purposes of this Strategy, environmental offset assessment information has been drawn from each draft EIS in order to identify those MNES and MSES values which may incur significant residual impacts and require offsets. Based on the MNES and MSES assessment methodology presented within each draft EIS, the extent of impacts presented within this Strategy should be considered as maximum potential extents as a number of species and communities have been identified as likely to be present in the absence of further field validation. As such, potential species and community habitats for the purpose of preliminary offset site identification have been extrapolated using regional ecosystem (RE) mapping until further field validation can be completed.

To better inform each project's impacts and offset requirements, ARTC will conduct further detailed ecological surveys which are scheduled to be finalised mid-2021. Information collected as part of these detailed investigations will support the confirmation of biodiversity values within the corridor, including their extent and ecological condition. Significant impact assessments for MNES, MSES and MLES will be subsequently refined and offset obligations quantified to establish a validated ecological impact / offset baseline.

Habitat quality assessments will be conducted according to the Department of Environment and Science (DES) *Guide to determining terrestrial habitat quality (Version 1.3, 2020)* (DES 2020b) for impact and offset site comparison as part of the planned detailed ecological surveys. Ecological impact and offset information derived from these investigations will also be used to inform the EIS assessment process as well as the development of the Preliminary Offset Delivery Plan. Accordingly, detailed offset calculations using the EPBC Act's Offset assessment guide have not been considered in this Strategy. However, the EPBC Act's Offset assessment guide will be applied following further detailed field assessments and will be included in a Preliminary Offset Delivery Plan scheduled for development mid-2021.

On this basis, those MNES and MSES values that may be required to be offset for each Queensland project is summarised in Table 2 and Table 3 for the Brigalow Belt and South East Queensland (SEQ) bioregions respectively. MNES are summarised in Table 2 with a breakdown of impacts for each project. MSES are summarised in Table 3 with a breakdown of impacts for each project. The information has been used to identify the type and number of ecological communities and species habitat that may require offsetting to inform ARTC's approach to offset delivery. It should be noted these values are preliminary and potential impact quantification will be refined following further detailed ecological assessments within the project alignment.

To maintain the intent of QEOP and avoid duplication of offset conditions between jurisdictions, MSES values which are also listed under EPBC Act are only presented in Table 2 as MNES. Vegetation communities and species which are State listed only, or are specific biodiversity values under QEOP, such as watercourse vegetation, are summarised in Table 3 and will be offset as MSES.

3.1 Identifying potential offset sites

ARTC has performed an assessment of offset availability and identification of potential offset sites that will deliver the Queensland project's offset requirements, as they are currently understood. The offset analysis has included identification of RE's that are known or likely to provide suitable habitat and were subsequently mapped using certified RE mapping (v11). Targeted RE's associated with remnant, high value regrowth (HVR) and unmapped regrowth were identified across a chosen study area of 100km either side of the project footprint and spatially clipped to the Brigalow Belt and South East Queensland bioregions. The results have provided a broad overview of offset availability for each of the offset values.

The potential to co-locate MNES and MSES values was then evaluated. This is shown in Table's 4 and 5 where 'offset groupings' have been categorised according to broad vegetation community associations, such as Brigalow TEC, which also provide habitat for a number of listed flora and fauna species. Priority offset properties were then selected through a process of ranking those which displayed collective characteristics such as; largest patch sizes of selected habitats, connectivity to existing protected areas and biodiversity corridors, proximity to records and availability of remnant, HVR and unmapped regrowth.

Table's 4 and 5 also present preliminary offset obligations recognising that baseline habitat and condition assessments for impact and offset sites have yet to occur. Adoption of a 1:4 ratio across all MNES and MSES to determine offset area obligation represents a conservative approach and final offset areas will be determined once habitat quality scoring has been completed.

Table 2 Potential MNES values impacted within Brigalow Belt and South East Queensland Bioregions

Anticipated MNES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
MNES	**EPBC Act Status**	**B2G**	**G2H**	**H2C**	**C2K**	**Total significant, residual impact area across the Queensland projects (ha)**
TEC's						
Swamp tea-tree (*Melaleuca irbyana*) forest of Southeast Queensland	Endangered	-	-	-	30.46	30.46
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	62.89	-	-	-	62.89
Weeping Myall Woodlands	Endangered	81.92	-	-	-	81.92
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	81.92	-	-	-	81.92
Threatened Flora Species						
Dichanthium queenslandicum (King blue- grass)	Endangered	5.29	-	-	-	5.29
Homopholis belsonii (Belson's panic)	Vulnerable	3.19	-	-	-	3.19
Lepidium monoplocoides (Winged peppercress)	Endangered	40.91	-	-	-	40.91
Notelaea lloydii (Lloyd's olive)	Vulnerable	-	-	21.26	26.77	48.03
Picris evae (A hawkweed)	Vulnerable	18.68		-	-	18.68
Rhaponticum australe (Austral cornflower)	Vulnerable	2.29		-	-	2.29
Sophora fraseri (Brush sophora)	Vulnerable	-	2.36	-	-	2.36

Anticipated MNES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
MNES	**EPBC Act Status**	**B2G**	**G2H**	**H2C**	**C2K**	**Total significant, residual impact area across the Queensland projects (ha)**
Threatened Fauna Species						
Anomalopus mackayi (Five-clawed worm-skink)	Vulnerable	16.68	-	-	-	16.68
Dasyurus maculatus maculatus (Spotted-tailed quoll)	Endangered	15.49	24.46	1.59	6.92	48.46
Delma torquata (Collared delma)	Vulnerable	295.76	197.41	85.33	9.56	588.06
Erythrotriorchis radiatus (Red goshawk)	Vulnerable	-		4.15	77.25	81.4
Furina dunmalli (Dunmall's snake)	Vulnerable	298.85	-	-	-	298.85
Lathamus discolor (Swift Parrot)	Critically Endangered	-	-	13.34	11.74	25.08
Petrogale penicillata (Brush-tailed rock-wallaby)	Vulnerable	-	-	4.88	-	4.88
Phascolarctos cinereus (Koala)	Vulnerable	481.05	157.39	98.66	124.31	861.41
Pteropus poliocephalus (Grey-headed flying-fox)	Vulnerable	-	201.19	99.46	71.44	372.09
Rostratula australis (Australian painted snipe)	Endangered	-	-	15.43	34.55	49.98
Turnix melanogaster (Black-breasted button quail)	Vulnerable	-	9.18	-	-	9.18
Tympanocryptis condaminensis (Condamine earless dragon)	Endangered	17.93		-	-	17.93

Table 3 Potential MSES values impacted within Brigalow Belt and South East Queensland Bioregions

Anticipated MSES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
MSES	NC / VMA Act Status	B2G	G2H	H2C	C2K	Total impact area across the Queensland projects (ha)
Regulated vegetation						
Prescribed RE	Endangered	62.74	9.8	-	10.56	83.1
Prescribed RE	Of Concern	151.50	89.62	-	9.02	250.14
Watercourse RE	-	43.88	4.3	0.77	16.09	65.04
Wetland RE	-	-	-	-	13.40	13.40
Essential Habitat	-	117.31	112.36	95.66	25.89	351.22
Connectivity areas						
Landscape fragmentation tool	-	560.51	122.87	-	27.29	710.67
Wetlands and watercourses						
No impact anticipated	-	-	-	-	-	
Designated precinct in a strategic environmental area						
No impact anticipated	-	-	-	-	-	
Protected wildlife habitat						
Acanthophis antarcticus (Common death adder)	Vulnerable	540.87		-	-	540.87
Callitris baileyi (Bailey's cypress)	Near Threatened	-	108.47	28.4	11.43	148.30
Calyptorhynchus lathami lathami (Glossy black-cockatoo)	Vulnerable	480.86	21.58	45.11	50.63	598.18
Caustis blakei subsp. macrantha (Caustis)	Vulnerable	-	10.41	-	-	10.41
Cyperus clarus (a sedge)	Vulnerable	974.12	-	-	-	974.12
Falco hypoleucos (Grey falcon)	Vulnerable	-	134.49	-	-	134.49
Marsdenia coronata (Slender milkvine)	Vulnerable	-	51.02	-	61.85	112.87
Melaleuca irbyana (Swamp tea-tree)	Endangered	-	-	128.78	237.73	366.51

Anticipated MSES Significant Residual Impact (ha) within the Brigalow Belt and South East Queensland Bioregions						
Ninox strenua (Powerful owl)	Vulnerable	-	101.1	28.63	21.54	151.27
Picris barbarorum (Tall hawkweed)	Vulnerable	567.49	-	-	-	567.49
Ornithorhynchus anatinus (Platypus)	Special Least Concern	-	-	47.77	-	47.77
Tachyglossus aculeatus (Short-beaked Echidna)	Special Least Concern	-	-	75.71	-	75.71
Koala habitat (*Nature Conservation (Koala) Conservation Plan 2017* mapping	-	81.73	303.33	-	-	385.06
Protected areas						
No impact anticipated	-	-	-	-	-	
Highly protected zones of state marine parks						
No impact anticipated	-	-	-	-	-	
Fish habitat areas						
No impact anticipated	-	-	-	-	-	
Waterways providing for fish passage						
No impact anticipated	-	-	-	-	-	
Marine plants						
No impact anticipated	-	-	-	-	-	
Legally secured offset areas						
No impact anticipated	-	-	-	-	-	

4 ARTC's Environmental Offset Delivery Strategy for Queensland

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Community consultation and collaboration to ensure these values are managed and maintained is central to this strategy. ARTC propose to combine environmental offset requirements across each Queensland project, within the relevant bioregion, and pool offset values to enable larger strategic environmental offset sites to be delivered.

The primary aim of the Strategy will be to identify a portfolio of offset properties that meet MNES, MSES and MLES offset obligations that are strategically located in proximity to the future rail corridor (impact area). The Strategy will also aim to secure offset properties that preferentially adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Ongoing land management will be conducted according to approved Offset Area Management Plans which will seek to maximise landscape conservation outcomes by increasing resilience of self-sustaining communities and populations whilst also seeking to achieve habitat quality gains at the offset site and improved connectivity within the region.

Offset area management will depend on the final offset portfolio, however, may include management by a landholder, an accredited community based not for profit conservation organisation, an established conservation management entity, government based or supported organisation, or a combination of these. Management actions are likely to include weed control, feral animal control, fire management, restoration and/or revegetation. Ongoing management of the offset portfolio will seek to foster community collaboration while achieving offset objectives and conservation outcomes under enduring arrangements such as covenants bound on title.

This Strategy recognises that the EIS and detailed design phase for each Queensland project is operating under progressive delivery schedules however offset site optimisation and determination will be performed collectively based on the best quantitative and qualitative information available at the time. As a result, land-based offsets may be generated that can be drawn down by each project progressively.

ARTC is seeking to avoid, minimise and mitigate environmental impacts to the greatest extent possible when identifying a preferred alignment, locating ancillary infrastructure and undertaking construction and operation for each project. For example, in sections of C2K, a realignment of the rail corridor was undertaken to avoid impacting significant biodiversity values including koala habitat. However, this also presented challenges for other threatened species and communities, resulting in unavoidable impacts to the *Melaleuca irbyana* TEC.

ARTC has identified opportunities to further minimise the impact footprint through design innovation on the Queensland projects. While there are opportunities to minimise impacts, there are also challenges as ARTC is constrained to the proposed rail alignment, as well as topographical and engineering constraints. Consequently, there are fewer opportunities to avoid impacts on biodiversity values in some areas. These avoidance and mitigation strategies are outlined within each draft EIS.

The following sections summarise the key offset delivery principles ARTC will be looking to achieve.

4.1 Application of Hierarchy and Confirmation of Offset Framework

ARTC propose that environmental offsets be assessed so that the offset requirements for the EPBC Act approval take precedence over State approvals, and offsets are rationalised for the same or substantially the same matter and the same or substantially the same impact assessed by the Commonwealth. On this basis, delivering offsets for MNES will also deliver conservation outcomes for State MSES and Local prescribed MLES values.

In line with this approach, ARTC will initially assess each project's offset requirements under the EPBC Act Significant Impact Guideline for MNES. An assessment of MSES and MLES will follow, in accordance with QEOP's Significant Residual Impact Guideline, to identify those MSES and MLES values that will be significantly impacted by a project, and which of those are relevantly associated with MNES. Matters of environmental significance that are only identified as MSES and MLES values will be delivered in consultation with the Coordinator-General, DES, DAF and DRNME where relevant. ARTC may consider financial settlement for these residual matters in accordance with the QEOP.

4.2 Risk mitigation for offset delivery

There are challenges and risks in delivering environmental offsets. These will be evaluated by ARTC and mitigation measures put in place at key stages and decision-making points. Risks include:

- Delivering offsets that accurately reflect the significant residual impacts on MNES, MSES and MLES
- Being able to identify suitable offset sites that support biodiversity values and areas required, particularly within the nominated offset hubs and corridors by DES
- Liaising with landholders and successfully securing offset arrangements
- Finalising legal security in a timely manner
- Addressing refinements to the offset requirements as the projects progress through the design phase and ensuring that offset sites identified earlier in the process have adequate representation including offset quantum and condition
- Achieving the set conservation outcomes for a particular matter over the agreed management timeframes.

Risk mitigation measures will include that ARTC commence offset site identification early in the process and do so in liaison with a number of stakeholders and land managers. A number of offset site options will be explored to ensure there are adequate contingencies should one or more sites not progress. ARTC will also ensure the refined impact assessments based on ground validation are informing offset site selection process and regular consultation occurs with regulators to ensure the offset process is discussed and agreed to as far as practicable. ARTC will look to secure land-based offsets that are known to support the relevant matters and the conservation gains proposed will be achieved through sound management measures tailored to the species and/or community with regular monitoring, and clear performance outcomes set. Offset sites will be legally secured as soon as practically possible, though acknowledging that elements of tenure negotiation and related administrative aspects may be beyond the control and influence of ARTC.

4.3 Staging Offset Assessment and Delivery

There are three main phases of delivery for each project; approvals phase, detailed design phase, and construction phase.

The approvals phase predominantly relates to the primary approvals such as EPBC Act and Coordinator-General's evaluation report for each EIS. Secondary approvals, which may also trigger offset obligations for MSES, such as the NC Act for listed flora species, will generally be obtained after the primary approvals have been granted. Therefore, the process of confirming significant residual impacts and environmental offset requirements will occur in a progressive manner, and there will need to be some flexibility to allow for impacts to be refined as ARTC work to confirm the footprint once a construction contractor is appointed and detailed design occurs.

ARTC propose a tailored approach to finalising and delivering the environmental offset requirements due to the scale and complexity of the project and delivery. This approach will also enable ARTC to maximise environmental outcomes that can be achieved through combining the Queensland project's offset requirements into two main bioregions (Brigalow Belt and SEQ).

For transparency, separate Environmental Offset Proposals will accompany each project to identify the likely environmental offset requirements for each relevant project. Once the full offset package is understood an Environmental Offset Delivery Plan will be prepared outlining the offsets to be delivered for all the Queensland projects. This approach is described below and summarised in Figure 2.

4.3.1 Prior to Project Primary Approval – Development of Environmental Offset Proposal – January 2021

- The impacts presented within each Environmental Offset Proposal will be subsequently refined and verified through supplementary field ecology surveys and condition assessments and consolidated within the Preliminary Environmental Offset Delivery Plan.
- Each Environmental Offset Proposal will summarise predicted offset values at a Commonwealth, State and Local level, upper disturbance limits, outlining the preferred offset approach, identifying offset site availability and timing for offset delivery. While each project will be evaluated separately, the offset delivery approach will take into consideration a coordinated offset package for Queensland as a whole.
- Land-based offset site options will be further refined, identified and discussed with regulators.
- ARTC will initiate the landholder engagement process and undertake preliminary assessment of potential offset sites to understand offset site suitability.

4.3.2 Post detailed ecological investigations – Development of the Preliminary Environmental Offset Delivery Plan – mid-2021

- As a result of subsequent field survey and verification, the extent of significant residual impacts will be refined for MNES, MSES and MLES prior to and including early detailed design phases. Depending upon detailed design, the total extent of impacts may be reduced, and some biodiversity values avoided altogether.
- Revised clearing limits and environmental offset requirements will be confirmed for each project.
- ARTC will confirm shortlisted offset site/s to meet a project's requirements, and any other supplementary measures proposed for the relevant project.
- Detailed ecological surveys will commence on the shortlisted offset sites to confirm presence of targeted biodiversity values, assess habitat quality and determine management actions required.
- Landholder discussions including seeking in-principle agreement will continue and be ongoing throughout the offset delivery program.
- Offset calculator assessments will be prepared (assessing impact site and offset site), using applicable assessment tools, to confirm final offset areas needed (ratios).
- During offset site analysis, ARTC will look to combine environmental offset requirements across the Queensland projects to increase conservation outcomes that can be achieved to optimise offset delivery. This may for example, include all koala habitat impacts are pooled and ARTC seeks to meet these offset requirements across a small number of larger offset sites. Co-location of offset values may also occur, for example, offsetting an Of Concern RE with Koala and Collared Delma habitat where the vegetation community provides the required habitat values for the species.
- The above information will be outlined in a preliminary Environmental Offset Delivery Plan (EODP).
- The preliminary EODP will be provided to DAWE, Coordinator-General, DES, DAF and DNRME for consultation.
- Offset Area Management Plan preparation will commence.
- MSES and MLES offset financial payments, where applicable, will be made prior to construction.

4.3.3 Prior to Construction Commencement – Submission and approval of Final Environmental Offset Delivery Plan and Offset Area Management Plan/s

- Seek approval of the finalised Environmental Offset Delivery Plan from Commonwealth and State Government.
- Environmental Offset Delivery Plan will include details of conservation outcomes to be achieved, management actions to be undertaken, risks and corrective actions, ecological monitoring and reporting.
- Offset Area Management Plan/s will be finalised and submitted for Commonwealth and State Government approval.
- Offset site negotiation will be finalised and conservation covenanting processes will commence.
- Offset site management has commenced.

4.3.4 Within 1 year of Construction Commencement – Offset Site Legally Secured

- All offset sites identified in the approved Environmental Offset Delivery Plan and Offset Area Management Plan/s will be legally secured under a legally binding mechanism within one year of construction commencement. Additional time may be needed for formal conservation covenanting and related administrative processes to occur. For example, enactment under a statutory instrument.
- There are a number of options for legally securing an offset site, including offset protection area under the EO Act, voluntary declaration under the *Vegetation Management Act 1999*, protected area under the NC Act, statutory covenants under the *Land Title Act 1994* or provisions under the EPBC Act. All options will be considered, and the final instruments chosen will depend on circumstances for each offset site.
- Due to the nature of the impacts and operational environment, legal security will be for at least the duration of the impact and the type of enduring covenants will be negotiated depending on the circumstances for each offset site.

4.4 Co-location of Offset Requirements on Strategic Offset Sites

ARTC's overarching objective is to deliver the Queensland project's environmental offset requirements through strategic land-based offsets. The primary focus will be identifying strategic offset sites that contain the required MNES, MSES and MLES values, based on bioregions, proximity to the rail corridor and are prioritised in offset hubs and corridors identified by DES in the Brigalow Belt and SEQ bioregions.

This approach should result in fewer but larger offset sites to be protected and managed and preferably will build resilience within the protected area estate and enhance biodiversity corridors. This approach will allow ARTC to pool offset requirements across Queensland projects, maximise conservation outcomes that can be achieved across the Inland Rail Program and increase efficiencies for delivery and management.

As the Queensland projects may progress across slightly different timeframes for construction commencement, when identifying offset sites, it will be ensured that a site or sites can cater to the upper disturbance limits that have been predicted. On this basis, the offset portfolio will be available for each relevant project to draw down their environmental offset obligations in accordance with the Environmental Offset Delivery Plan.

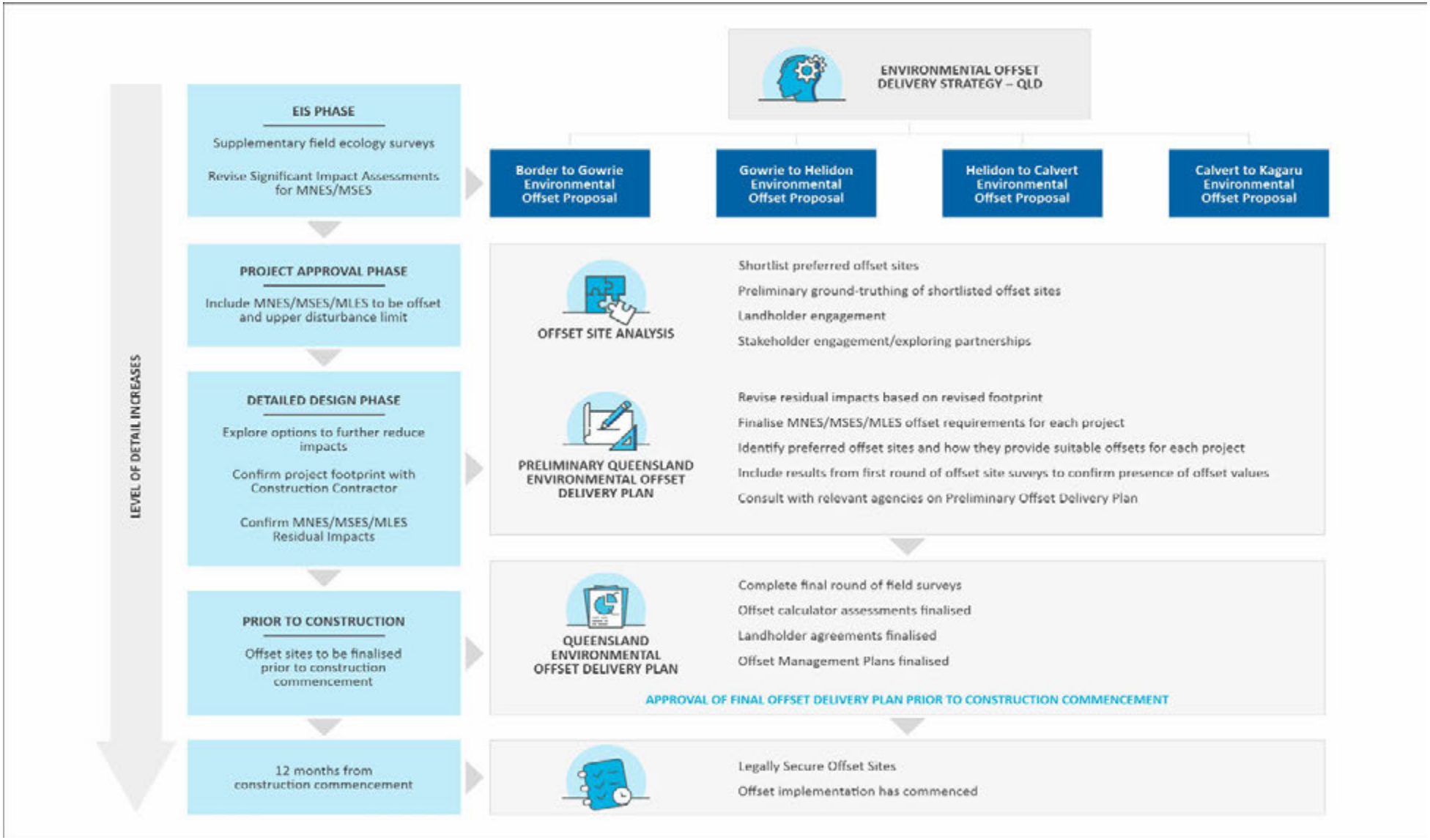

Figure 2 Staging Offset Assessment and Delivery

5 Strategic offset site identification

5.1 Methodology

An initial desktop assessment has been undertaken with the aim of identifying potential strategic offset sites that can meet the Queensland project's environmental offset requirements as they are currently understood. The intent of this initial investigation was to assess land-based offset feasibility as well as offset portfolio optimisation. Offset portfolio optimisation was initially established to identify areas where maximum co-location of offset values may be achieved, and preference given to patches of threatened species habitat and ecosystems that are of a large size and strategically located to ensure connectivity such as adjoining protected area estates, conservation reserves and / or bioregional corridors.

For some values a combination of properties may be required to meet the total offset area needed. Further offset portfolio optimisation will occur as assessments progress to include landholder engagement and ground-truthing to validate suitability of properties.

Specific property address and lot on plan details have been withheld for the purpose of this offset feasibility assessment to preserve landholder privacy during this early stage of the assessment process.

5.2 Preliminary Offset Site Identification Results

Eight preliminary offset sites for the Brigalow Belt bioregion and eleven preliminary offset sites for the South East Queensland bioregion have been identified through initial desktop offset analysis and optimisation assessments. The combination of these 19 sites are expected to meet all MNES offset requirements and a large proportion of the estimated MSES offset requirements as they are currently understood. The properties summarised have been shortlisted due to containing large areas of the required offset values, in a number of instances there are records on the property or nearby, they are strategically located, and provide opportunities to co-locate a number of MNES and MSES values within the same areas of bushland or property. The offset analysis and properties shortlisted demonstrate that there are large areas of suitable vegetation and habitats available in the landscape, not too far from impact areas, and the offset areas can be placed on strategically located properties to maximise conservation outcomes and connectivity.

While certain impacted vegetation communities are more geographically restricted in their distribution, and some species are specialised in their habitat requirements, offset groupings have been adopted to assist locate suitable offset sites. Considerations have included RE's that have the potential to support a number of species, locations where a species or community is known to occur, size of potential habitat areas available and connectivity in the landscape.

The offset sites identified under this assessment do not necessarily represent the final offset sites or definitively reflect all MNES, MSES and MLES offset requirements however demonstrates the feasibility of offset co-location across a variety of prescribed matters. Each offset site may contain several cadastral parcels however would be assessed as one 'offset site' as they are located adjacent to each other and databases suggest are owned by the one landowner.

Further offset site optimisation on revised MNES, MSES and MLES impact information will be subsequently undertaken in order to generate an up to date offset feasibility property portfolio. Results of the updated offset property feasibility assessment will be discussed with relevant Commonwealth and State Government departments which will facilitate the development of the Preliminary Environmental Offset Delivery Plan.

A high-level summary of the 19 shortlisted offset sites, offset values they contain, and area available, is provided in Table 4 and Table 5.

Based on the selected offset properties, and habitat areas estimated as available, there are some MSES values which have not been fully acquitted by the chosen properties. Desktop analysis across the broader study area has demonstrated that there is more than adequate availability for each offset value, but due to the nature of some values, such as RE's which are restricted in range, or fauna species with specialised habitat requirements, based on a desktop assessment, they don't currently occur in shortlisted properties chosen at present.

The following offset values are currently showing a shortfall:

- *Cyperus clarus*
- Grey falcon
- Powerful owl
- Platypus
- Slender milkvine
- Endangered RE12.3.18
- Of Concern RE12.3.8
- Of Concern RE12.9-10.16

There are a number of steps that will address where shortfalls are currently showing. These are:

- Supplementary field ecology surveys of impact areas may identify a reduced extent of the MNES and/or MSES values. Supplementary field ecology surveys for the Queensland projects are due for completion mid-2021;
- Ground-truthing of offset sites may identify additional suitable areas of ecological communities and/or species habitats are present;
- Habitat quality scoring on impact and offset areas may determine less area is required (currently 1:4 ratio has been applied across all values);
- Additional offset properties may be added to the offset portfolio to make up any identified shortfalls;
- Indirect offsets may be considered where less than 10% of the total offset requirement needs to be made up;
- For MSES shortfalls ARTC will consider financial payments to DES.

MSES wetlands, watercourse vegetation, connectivity and essential habitat will be co-located across the offset property portfolio with other suitable MNES and MSES values. For example, under QEOP connectivity offsets are to be provided at a 1:1 ratio utilising regrowth vegetation. Regrowth vegetation that provides important connections between other remnant tracts, along watercourses, or may be adjacent to an existing protected area, will be used to offset connectivity. All nominated offset properties contain stream orders and there will be watercourse vegetation that can be used, particularly where offset values include riparian RE's such as 11.3.2, 12.3.3 etc. Confirmation of which properties these MSES values will be offset on, and how much area is required, will be provided post ground-truthing being undertaken of preferred offset sites and habitat quality scoring completed.

5.3 Offset site selection and management principles

Offset sites identified through the offset property feasibility assessment process will be assessed to meet the principles of the EPBC Act Environmental Offset Policy and to be consistent with the QEOP.

Each proposed offset property will be assessed against the following criteria and an initial assessment of the identified potential offset sites under the policy principles is provided below.

5.3.1 Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters detailed in the Environmental Offset Delivery Plan.

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Offset properties will support those ecological communities and species habitats that have been impacted providing a 'like for like' conservation outcome. The properties will deliver an overall conservation outcome for those MNES (Table 2) and/or MSES values (Table 3) required to be offset through:

- Improving ecological condition of vegetation communities and species habitats through land management activities such as weed control, pest animal management, grazing management and fire management;
- Restoration of degraded vegetation and habitats including areas affected by erosion, fragmentation, and/or lack of microhabitats such as native groundcover and fallen woody debris
- Revegetation of vegetation communities and species habitats increasing their extent;
- Removal and/or reduction of threats such as preventing clearing of regrowth, managing the risk of wildfires, limiting the cropping of native grasslands;
- Monitoring and research to improve knowledge and understanding of habitat restoration techniques; and species utilisation of habitats or other compensatory measures tailored to the particular MNES or MSES.

Preference will be given to offset properties that adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Offset sites will preferentially include a diverse range of offset requirements such as TEC's and endangered or of concern ecological communities that also support threatened species habitats and may include ecological values such as watercourse vegetation, wetlands and improve connectivity. Offset areas will be targeted to consist of a combination of remnant and regrowth vegetation and historically cleared land that can be restored/revegetated to improve habitat quality, connectivity and functionality. These habitat quality gains will be measured by applying the *Guide to determining terrestrial habitat quality* (DES, 2020).

The chosen potential offset sites were selected as they support functional vegetation communities (remnant, high value regrowth (HVR) and unmapped regrowth) that can be managed to build resilience, improve connectivity and achieve habitat quality gains. Habitat quality gains may include human induced restoration of non-remnant communities (regrowth management) through to replanting programs depending upon the targeted impacted matters. Ongoing land management will be conducted according to approved Offset Area Management Plan/s which will seek to maximise landscape conservation outcomes by increasing resilience of self-sustaining communities and populations while providing improved habitat and connectivity for impacted MNES, MSES and MLES species within the region. Offset management on the properties will include weed control, fire management including managing fuel loads to prevent hot bushfires, pest animal control, fencing, grazing management, revegetation (where this is suitable such as koala habitat or seeding of native grasses), erosion management etc.

Ground-truthing of each proposed offset property will occur to validate suitability of vegetation communities and species habitats, to assess starting habitat quality, confirm management actions required and ascertain habitat quality gains that can be achieved.

The covenanting mechanism will be tailored to the relevant protected matter/s and property and will be established to limit, to the extent possible, future adverse development potential. The protection of the offset area will remain on title to bind any future landowners.

5.3.2 Suitable offsets must be built around direct offsets but may include other compensatory measures

ARTC's overarching strategy is to deliver a strategic land-based offset portfolio that will contribute to an overall conservation outcome to improve the protection, management and viability of impacted MNES, MSES and MLES values. Currently it is expected that direct offsets will meet 100% of MNES offset requirements and deliver over 90% of the project's MSES offset requirements.

The potential offset properties presented within this Strategy support those ecological communities and species habitats that have been impacted providing a 'like for like' conservation outcome. The properties will deliver an overall conservation outcome for those MNES and/or MSES values required to be offset through:

- Improving ecological condition of vegetation communities and species habitats;
- Restoration of degraded vegetation and habitats;
- Revegetation of vegetation communities increasing their extent;
- Removal and/or reduction in threats such as from weeds, fire, pest animals;
- Removal of ear-marked development pressure;
- Monitoring and research to improve knowledge and understanding of habitat restoration techniques, a species utilisation of habitats or other compensatory measures tailored to the particularly MNES or MSES.

Opportunity for indirect offsets will be explored, consistent with the EPBC Act Environmental Offset Policy, particularly around research opportunities for key threatened species such as Koalas or species such as Condamine earless dragon where research is required to identify more about its distribution and population size, habitats and breeding. These measures may be proposed should land-based offsets not quite meet 100% of total obligation under calculator. Indirect offsets will be informed by key priority actions defined in approved recovery plans, threat abatement plans, conservation advice, ecological character descriptions or approved Commonwealth / State management plans.

5.3.3 Tenure for direct offsets

There are a number of options to legally secure an offset site, including an offset protection area under the EO Act, voluntary declaration under the *Vegetation Management Act 1999*, a protected area under the NC Act, statutory covenants under the *Land Title Act 1994* or provisions under the EPBC Act. All enduring options that are governed by legislation will be considered, and the final instrument chosen will depend on circumstances for each offset site including land tenure, landowners, and the MNES and MSES subject to management and protection.

Offset sites will be selected on the basis of ecological characteristics, opportunity for maintaining and/or improving the viability of the protected matter and those threatening processes which may undermine the future resilience of those matters if not managed and protected under an offset arrangement. Any land use or tenure inconsistent with delivering conservation outcomes will be considered during offset site selection process such as mining or petroleum leases and excluded from consideration where possible.

The Offset Area Management Plan/s will be linked to the agreed offset securing mechanism which will drive monitoring, assessment, compliance and reporting requirements.

A landowner will have a legal obligation to manage their property in accordance with the approved management plan. This may include stopping activities that could degrade the offset values (e.g. logging in bushland) or reduction of stocking rates and pulse grazing.

5.3.4 Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter

The land-based offsets proposed will meet the EPBC Environmental Offsets Policy and Offsets Assessment Guide which considers the status of the impacted MNES being offset. The status of the MNES is considered by the calculator in determining the extent of offset area required.

For MSES the offsets will comply with the Qld Environmental Offsets Policy.

Habitat quality of the impact areas and offset site will be determined using the Queensland State Government's Guide to determining terrestrial habitat quality - Methods for assessing habitat quality under the Queensland Environmental Offsets Policy (Version 1.3 February 2020) (DES, 2020b). Habitat quality values derived from the impact areas and offset sites will form an important component in determining the extent of offset area required through application of the EPBC Act's Offsets assessment guide.

5.3.5 Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter

Offset sites will be assessed proportionate to the size and scale of the residual significant impacts determined by detailed field-based ecological assessments in order to maintain and/or improve the viability and resilience of the protected matter/s. The assessment will consider:

- The level of statutory protection applied to the protected matter
- Particular attributes of the protected matter (for example site condition, context and type of habitat for species i.e. breeding habitat or foraging habitat)
- Quality or importance of the nature of the impacts on the protected matter and their future viability
- Temporal nature of the impacts
- Confidence in the habitat quality gains proposed
- Predicted time to generate a conservation gain.

Preference will be given to offset properties that adjoin protected area estates, conservation reserves and / or large intact remnants which are located within prioritised offset hubs and / or bioregional corridors. Offset sites will preferentially include a diverse range of offset requirements such as TEC's and endangered or of concern ecological communities that also support threatened species habitats and may include ecological values such as watercourse vegetation, wetlands and improve connectivity. Offset areas will also likely consist of a combination of remnant and regrowth vegetation and cleared land that can be restored or revegetated to improve habitat quality.

The EPBC offsets calculator inputs will determine the final size of offset area needed to satisfy the policy requirements. To support an initial assessment of the extent of offset areas that may be needed for each MNES and MSES value, a 1:4 ratio was applied.

5.3.6 Suitable offsets must effectively account for and manage the risks of the offset not succeeding

A risk-based approach incorporating the precautionary principle will form an integral component in the offset site selection process and offset area management principles, objectives and outcomes which articulate clear and definable acceptance criteria. A risk matrix will be developed for each offset site that will identify the risks of the offset not succeeding including protection of the offset and habitat quality gains.

Relevant actions to manage risk include:

- Selecting sites that avoid conflicts with future development including mining leases;
- Selecting sites which are not isolated to maximise connectivity potential in the landscape;
- Utilising functioning ecosystems including a combination of remnant and regrowth;
- Legally securing the offset area on title;
- Restricting access;
- Weed monitoring and control;
- Grazing management;
- Pest fauna management;
- Fuel load management and fire management.

5.3.7 Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs

Offset sites will be selected on the basis that they will generate conservation outcomes for the protected matter/s impacted, acknowledging the nature and scale of the proposed action, which would generate beneficial species specific or vegetation community outcomes above and beyond existing statutory and planning requirements associated with the land parcel. This includes existing State and Local Government laws and planning regulations associated with the land parcel and its associated ecological values and threat abatement measures (including biosecurity obligations).

The land-based offsets will provide significant ‘additionality’ to what is required by law or planning regulation. Currently the proposed offset properties include unprotected regrowth which can be lawfully cleared. Agricultural practices also occur such as grazing and cropping which have the potential to degrade the offset values. A number of weeds and pest animals are also not required to be managed under Qld legislation and therefore would continue to degrade ecological condition of the sites.

In Queensland there are no existing land management obligations that prescribe or exclude fire. Hot fires and too frequent fires have the potential to degrade and destroy MNES and MSES habitat values including brigalow, hollow-bearing trees and regenerating trees.

‘Additional’ actions that may be implemented include protecting and managing unmapped regrowth, removing or reducing grazing levels, actively improving condition of remnant vegetation through weed control, undertaking supplementary tree plantings and reducing feral animals and fuel loads.

5.3.8 Links with Australian and State approval processes

ARTC is committed to providing environmental offsets for residual significant impacts to MNES and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

Land-based offsets that comply with the EPBC Act Environmental Offsets Policy will form the initial focus for delivering the project's Queensland environmental offset requirements. Land-based offsets will be strategically located and co-locate a number of the project's MNES, MSES and MLES offset requirements. Financial settlement payments may be considered for those residual MSES and MLES matters that cannot be co-located with MNES matters according to the QEOP. Any financial settlement payment for MSES and/or MLES will be calculated by applying the Financial Settlement Offset Calculation Methodology set out in the QEOP. Financial settlement will be paid prior to the commencement of the relevant impact.

5.3.9 Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable

The proposed offset package and governance framework will be efficient, effective, timely, scientifically robust and transparent in design and implementation.

ARTC will seek approval of the Environmental Offset Delivery Plan and associated Offset Area Management Plan/s prior to construction commencement. Offset area management will be initiated prior to construction commencement to reduce the time lag between project impacts and agreed offset objectives. The Offset Area Management Plan/s will be scientifically robust, based on ground truthed surveys consistent with applicable and relevant Australian and State Government survey guidelines specific for the protected matter/s. Monitoring and management measures associated with the Offset Area Management Plan/s will be outcome driven with definable acceptance / completion criteria to minimise risk of failure.

This Strategy represents a cost-effective approach to providing a direct offset, achieved through implementing widely applied and verified management strategies that are consistent with Conservation Advice statements as to threats which require intervention.

The offset outcomes will be delivered progressively over 20 years and maintained an agreed period of time. Legal security of the offsets will occur within 12 months of offset management plans being approved.

Implementation of the offset management plans will be monitored and reported in annual compliance reports. There is strong evidence to demonstrate the likelihood of the offset achieving improvement in TEC and MNES habitat condition (DoE 2013; Ponce-Reyes et al. 2016).

There will be annual monitoring and reviews of the offset activities and annual reports prepared.

5.3.10 Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced

The Offset Area Management Plan/s will define appropriate and transparent governance arrangements which will include defining roles and responsibilities of all responsible and accountable parties associated with offset delivery including on-ground management, monitoring and reporting.

The Offset Area Management Plan/s will define:

- Conservation outcomes and associated management actions;
- Monitoring activities and timeframes;
- Performance criteria to be achieved for each MNES and interim milestones;
- Corrective actions and triggers for corrective actions;
- Auditing and reporting.

The approved Environmental Offset Delivery Plan and Offset Area Management Plan/s will be made available on Inland Rail's website for public viewing.

Table 4 Summary of potential offset sites for Brigalow Belt bioregion impacts

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Brigalow grouping													
Brigalow TEC	251.56	[redacted]	[redacted]	1,260	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property contains patches of brigalow vegetation including approx. 370 ha of remnant RE11.9.5 Acacia harpophylla and/ or Casuarina cristata open forest on fine-grained sedimentary rocks and RE11.4.9 Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains. There are also large areas of unmapped regrowth (>800ha) which are likely to support brigalow communities (aligned with RE11.9.5). Preference would be to offset those areas of remnant and regrowth brigalow which are [redacted] and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity. [redacted]								
Dunmalls snake	1,195.4	[redacted]	[redacted]	1,260	The property is located in the Brigalow Belt bioregion and within the species modelled distribution. Dunmall's Snake is found in open forest, particularly brigalow Acacia harpophylla forest and woodland growing on floodplains of deep-cracking black clay and clay loam soils. The property contains large areas of brigalow woodland both remnant and regrowth. There is likely to be suitable micro-habitat for the species in remnant patches and more advanced regrowth areas. [redacted] Preference would be those areas of habitat which are [redacted] and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.								
Belson's panic	12.76	[redacted]	[redacted]	1,485.90	The property is likely to support suitable habitat for Belson's panic including *Casuarina cristata* and *Acacia harpophylla* woodlands. The species has a preference for shady areas in these communities. RE11.9.5 is known to support the species. RE11.3.18 is also mapped on the property which provides suitable habitat. There is a record of the species directly to the north of [redacted], within a small patch of RE11.9.5. [redacted] Preference would be those areas of habitat which are [redacted] and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity, such as south-west region [redacted].								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Grassland grouping													
King bluegrass	21.16	[redacted]	[redacted]	751.97	The property is large and made up of a number of land parcels. It is located in the Brigalow Belt bioregion, [redacted], Qld. It is likely to support suitable habitat for King bluegrass as it contains native grasslands and open grassy woodland being; RE11.8.5, 11.8.5a and 11.8.11. These grasslands and open grassy woodlands are known to provide suitable habitat for the species. The property is mapped as containing remnant and regrowth open grassy woodlands as well as non-remnant grasslands with potential for restoration. The area is within the species known distribution.								
Hawkweed	74.72	[redacted]	[redacted]	748	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for Hawkweed as it supports eucalypt open woodlands with a grassy understorey being; RE11.3.2, 11.3.18, 11.3.21,11.8.5 and 11.8.5a which are known to support the species. The property contains patches of remnant and regrowth communities. Records of the species exists to the north and east of the property.								
Austral Cornflower	9.16	[redacted]	[redacted]	729.13	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for Austral Cornflower as it occurs in woodland and grasslands associated with various eucalypt species. RE11.3.4 and 11.8.5 are known to support the species. The property contains patches of remnant, high value regrowth and regrowth communities. Records of the species exist on the eastern boundary of the property and also to north, east and south.								
Tall Hawkweed	2269.96	[redacted]	[redacted]	3025.53	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for Tall Hawkweed as it occurs on floodplains on heavier alluvial soils. RE11.3.2, 11.3.4 and 11.5.1 are known to support the species. The property supports large areas of remnant woodlands including patches of 11.5.1, 11.3.2 and 11.3.4 adjacent to watercourses.								
***Cyperus clarus* (a sedge)**	3896.48	[redacted]	[redacted]	729.43	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for *Cyperus clarus* as it occurs in grassland and open woodland. RE11.8.5 and 11.8.11 are known to support the species. The property contains patches of remnant, high value regrowth and regrowth communities. Records of the species exists [redacted] property.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Condamine Earless Dragon	71.72	[redacted]	[redacted]	23.02	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for Condamine Earless Dragon as it occurs in native grasslands and open grassy woodlands. RE11.3.21, 11.3.4 and 11.8.11 are known to support the species. The property contains patches of remnant, high value regrowth and non-remnant grasslands with potential for restoration. The southern portions of the property are [redacted]. There is a record of the species [redacted].	[redacted]	[redacted]	145.92	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for the species as it can occur in communities including RE11.3.2, 11.3.4 and 11.3.25.				
Five-clawed Worm Skink	66.72	[redacted]	[redacted]	720.55	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is likely to support suitable habitat for Five-clawed Worm Skink as it occurs in grasslands and woodlands. RE11.3.21, 11.3.25 and 11.8.5 are known to support the species. The property contains patches of remnant, high value regrowth and regrowth communities. There is likely to be suitable microhabitat for the species particularly in those remnant and advanced regrowth areas. The [redacted] of the property are located in a state significant biodiversity corridor.								
Common death adder	2,163.48	[redacted]	[redacted]	780.68	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The species is found in a wide variety of habitats in association with deep leaf litter, including wet sclerophyll forests, woodlands and grasslands. The property supports large tracts of woodlands including 11.8.5, 11.8.5a, 11.3.21. The [redacted] of the property are located in a state significant biodiversity corridor.	[redacted]	[redacted]	1,763	The property contains large areas of remnant woodlands and some regrowth vegetation that have potential to provide suitable habitat for the species. The species is found in a wide variety of habitats in association with deep leaf litter, including wet sclerophyll forests, woodlands and grasslands. The property is strategically located within a state significant biodiversity corridor [redacted]				
Eucalypt woodland grouping													
Poplar Box/Weeping Myall TEC	327.68	[redacted]	[redacted]	3.18	This is a large property situated in the Brigalow Belt bioregion [redacted] Qld. The property contains large areas of remnant eucalypt woodlands (>3,000 ha) and unmapped regrowth eucalypt woodlands (>350ha). This includes riparian areas with potential to support RE11.3.2 which are associated with Poplar Box TEC and Weeping Myall TEC. The larger watercourses are on north-eastern boundary and offset may consist of managing regrowth RE11.3.2 and potentially revegetation. The property is strategically [redacted] state significant biodiversity corridor [redacted].	[redacted]	[redacted]	44.24	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property contains areas of Poplar Box (*Eucalyptus populnea*) including approximately 44.24 ha of remnant RE11.3.2 *Eucalyptus populnea* woodland on alluvial plains. Preference would be those areas of Poplar Box which are adjacent to [redacted] and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.	[redacted]	[redacted]	157	The property is situated north of Inglewood and directly [redacted] The property is mapped as containing large areas of HVR and unmapped regrowth of 11.3.2. There are large areas on land zone 3 and a stream order 4 through [redacted] The property is located directly adjacent [redacted]

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Poplar Box/Weeping Myall TEC (continued)		[redacted]	[redacted]	146.2	This is a large property situated in Brigalow Belt bioregion, [redacted] Qld. The property contains large areas with potential to support unmapped regrowth and restoration of RE11.3.2. This RE is associated with Poplar Box and Weeping Myall TEC. These potential TEC areas are adjacent to [redacted]	[redacted]	[redacted]	5.86	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property is mapped as containing areas with potential for restoration of RE11.3.2. This RE is associated with Poplar Box and Weeping Myall TEC.				
Of Concern RE11.3.4	56.96	[redacted]	[redacted]	91.44	The property supports small patches of remnant 11.3.4. It is also mapped as containing mixed polygons 11.3.2/11.3.4/11.9.7 as HVR and unmapped regrowth. Ground-truthing would need to occur to determine extent of 11.3.2, 11.3.4 and 11.9.7 on the property. The property is situated [redacted] There is a large patch of remnant 11.3.4 to north of property.								
Of Concern RE11.5.14	198.84	[redacted]	[redacted]	974	The property is situated in the Brigalow Belt bioregion, [redacted] The property contains large areas of remnant RE 11.5.14 and non-remnant grasslands associated with this RE. The remnant areas are connected to other large areas of these grasslands to the south and west. Restoration of these grasslands is likely to be required based on current land uses in the area which include cropping and grazing.								
Of Concern RE11.9.7	21.32	[redacted]	[redacted]	16.44	The property supports areas of RE11.9.7 as HVR and unmapped regrowth. The RE is within mixed polygons of 11.3.2/11.3.4/11.9.7. Ground-truthing would need to occur to determine extent of 11.3.2, 11.3.4 and 11.9.7 on the property.	[redacted]	[redacted]	211.10	The property is located in the Brigalow Belt bioregion, north-west of Inglewood. The property supports large areas of RE11.9.7 including remnant and unmapped regrowth. The property is strategically located [redacted]				
Koala	1924.20	[redacted]	[redacted]	1,763	Koala habitat on the property consists of large areas of remnant and regrowth eucalypt woodlands including RE11.3.2, 11.3.25, 11.5.4 and 11.5.20. The vegetation communities being 11.3.2 Eucalyptus populnea woodland on alluvial plains and 11.3.25 Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines occur on alluvial areas adjacent to watercourses and consist of regrowth vegetation. These regrowth habitats would be managed and potential revegetation of koala habitat trees undertaken to improve connectivity. Remnant woodlands are dominated by RE11.5.20 Eucalyptus moluccana and/or E. microcarpa and/or E. woollsiana +/- E. crebra woodland or RE11.5.4 Eucalyptus chloroclada, Callitris glaucophylla, C. endlicheri, Angophora leiocarpa woodland on Cainozoic sand plains. These are known to support the species. There are koala records [redacted] which are connected through remnant patches of woodland.	[redacted]	[redacted]	448	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property contains areas of Poplar Box (*Eucalyptus populnea*) including approximately 44.24 ha of remnant RE11.3.2 *Eucalyptus populnea* woodland on alluvial plains. The property contains areas of open woodland associated with RE11.3.4 and 11.3.25 which occur on the property are known to support the species. The riparian vegetation communities on the property will provide preferred foraging resources and movement corridors for the species. Preference would be those areas of Poplar Box which are adjacent [redacted] and/or have connections along creeklines and to existing intact bushland areas to maximise connectivity.				

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments	Property name	Lot and Plan	Estimated area available (ha)	Comments
Spotted tail quoll	61.96	[redacted]	[redacted]	101.68	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property contains areas of open woodland. RE11.3.4 and 11.3.25 which occur on the property are known to support the species. The property contains patches of remnant communities. There is likely to be suitable denning habitat for the species.								
Collared delma	1183.04	[redacted]	[redacted]	676.84	The property is located in the Brigalow Belt bioregion [redacted]. The property supports woodlands on land zones 3 and 9 with potential to support the species including 11.3.2 and 11.9.7. This species predominately inhabits eucalypt-dominated woodlands and open forests on land zones 3, 9 and 10. The presence of terrestrial microhabitat is critical for this species occurrence. Microhabitat attributes of which it shows strong associations with include rocky substrates, woody debris, and deep leaf litter (DAWE 2020). There is a collared delma record on the northern boundary of the property [redacted] The property is strategically [redacted]	[redacted]	[redacted]	448.00	The property is located in the Brigalow Belt bioregion, [redacted], Qld. The property contains areas Poplar Box woodland. RE11.3.2 is known to support the species. The property contains patches of remnant communities. There is likely to be suitable microhabitat present for the species.	[redacted]	[redacted]	151.89	The property is situated [redacted] The property is mapped as containing large areas of HVR and unmapped regrowth of 11.3.2. There are large areas on land zone 3 and a stream order 4 [redacted]. The property is located directly adjacent to large intact remnant areas [redacted]
Glossy black cockatoo	1923.44	[redacted]	[redacted]	1,756	This is a large property situated in the Brigalow Belt bioregion, [redacted], Qld. The species is known to be associated with RE11.5.4. This community supports foraging species including *Callitris glaucophylla*, *Angophora leiocarpa*, +/- *A. floribunda* with a low tree layer dominated by species such as *Allocasuarina luehmannii*, *A. inophloia* and *Callitris endlicheri*. There are records of Glossy black cockatoo [redacted] An additional biodiversity value of the property is it contains records of Brush-tailed rock wallaby and *Macrozamia machinii* both listed as vulnerable under NC Act.	[redacted]	[redacted]	1,053.06	The property is located in the Brigalow Belt bioregion, [redacted]. The property supports vegetation communities that provide suitable foraging resources for the species including RE's 11.3.14, 11.3.18, 11.5.1, 11.9.5. The property contains large areas of remnant, HVR and unmapped regrowth which are likely to provide foraging and denning habitat for the species. The property is strategically located [redacted]	[redacted]	[redacted]	974	The property is situated in the Brigalow Belt bioregion, [redacted]. The property contains large areas associated with RE 11.5.14 including remnant and regrowth. The remnant areas are connected to other large areas of these grasslands/shrublands to the south and west. The community includes scattered trees and shrubs or patches of shrubland to low open woodland of Allocasuarina luehmannii which are used by the species. Restoration of these grasslands is likely to be required based on current land uses in the area which include cropping and grazing.
Winged Peppercress	163.64	[redacted]	[redacted]	1,756	This is a large property situated in the Brigalow Belt bioregion, [redacted], Qld. The species is known to be associated with RE11.5.4. *Eucalyptus chloroclada*, *Callitris glaucophylla, C. endlicheri, Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces. There are large areas of remnant RE11.5.4 mapped on the property and unmapped regrowth that are likely to provide suitable habitat for the species.								

Table 5 Summary of potential offset sites for South East Queensland bioregion impacts

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
***Melaleuca irbyana* grouping**													
Swamp tea-tree (*Melaleuca irbyana*) forest of Southeast Queensland (TEC)	121.84	[redacted]	[redacted]	91.49	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M. irbyana* TEC areas are known to occur. The property supports vegetation communities that consist of RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. These patches of vegetation would be managed to enhance habitat quality and ensure the vegetation meets TEC criteria. The property is strategically located in [redacted] and areas of *M. irbyana* communities are also connected to other potential habitats for the TEC. The property is [redacted].	[redacted]	[redacted]	69.74	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M. irbyana* TEC areas are known to occur. The property supports vegetation communities including RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located [redacted] and areas of *M. irbyana* communities on the site are connected to other potential habitats for the TEC. The property is [redacted]	[redacted]	[redacted]	111.56	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M.irbyana* TEC areas are known to occur. The property supports areas of remnant, HVR and regrowth RE12.9-10.11, 12.3.19 and 12.9-10.27 which may support the TEC. The property is strategically [redacted].
***Melaleuca irbyana* (Swamp tea-tree)**	1,466.04	[redacted]	[redacted]	257.78	The properties are located in South east Queensland bioregion [redacted] The properties contain mapped essential habitat for the species. Vegetation communities include remnant, HVR and unmapped regrowth patches of 12.9-10.27 and 12.9-10.11. These are [redacted] an area where there is potential for large areas of the individual species to occur.	[redacted]	[redacted]	707.00	The properties are located in South east Queensland bioregion [redacted]. The properties contain vegetation communities including RE12.3.19, 12.9-10.27 and 12.9-10.11. There are large patches of HVR, some remnant patches and unmapped regrowth. Some properties contain mapped essential habitat for *M. irbyana*. These are a [redacted] area where there is potential for large areas of the individual species to occur.	[redacted]	[redacted]	229.11	These properties are located [redacted] The properties are mapped as supporting RE's 12.9-10.11 and 12.9-10.27 known to provide suitable habitat for the species. [redacted] is potential for large areas of the individual species to occur.
***Melaleuca irbyana* (Swamp tea-tree)** (continued)		[redacted]	[redacted]	91.49	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M. irbyana* is known to occur. The property supports large areas of suitable habitat including RE12.9-10.11 and 12.9-10.27 and 12.3.19. These areas of vegetation include remnant, HVR and unmapped regrowth. The species is likely to be present across the property. The property is strategically located [redacted] and areas of suitable habitat for M. irbyana are also connected to other potential habitats for the species and associated TEC. The property is [redacted].	[redacted]	[redacted]	69.74	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M. irbyana* populations are known to occur. The property supports large areas of suitable habitat for the species including RE12.9-10.11, 12.9-10.27 and 12.3.19. Areas of vegetation include remnant, HVR and unmapped regrowth. The species is likely to be present across the property. The property is strategically located [redacted] and areas of *M. irbyana* habitat are connected to other potential habitats for the species. The property is [redacted]	[redacted]	[redacted]	111.56	[redacted] in the South east Queensland bioregion. The property is situated within an area where populations of *M.irbyana* are known to occur. The property supports areas of remnant, HVR and regrowth RE12.9-10.11, 12.3.19 and 12.9-10.27 which are known to support the species. The species is likely to be present across the property. The property is strategically [redacted].

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Endangered RE12.3.19	42.68	[redacted]	[redacted]	1.78	[redacted] in the South east Queensland bioregion. The property supports small patches of RE12.3.19. The property is strategically located [redacted] and areas of suitable habitat for *M. irbyana* are also connected to other potential habitats for the species and associated TEC. [redacted].	[redacted]	[redacted]	1.2	[redacted] the South east Queensland bioregion. The property is situated within an area where *M. irbyana* populations are known to occur. The property supports small patches of RE12.3.19 which are unmapped regrowth. The property is strategically located [redacted] and areas of *M. irbyana* habitat are connected to other potential habitats for the species. [redacted]	[redacted]	[redacted]	41.38	[redacted] in the South east Queensland bioregion. The property is situated within an area where populations of *M.irbyana* are known to occur. The property supports areas of remnant, HVR and regrowth RE12.3.19. The property is strategically [redacted]
Endangered RE12.9-10.11	45.2	[redacted]	[redacted]	40.33	[redacted] in the South east Queensland bioregion. The property supports large areas of RE12.9-10.11, including remnant, HVR and unmapped regrowth. The property is strategically located in a regional corridor and areas of suitable habitat for *M. irbyana* are also connected to other potential habitats for the species and associated TEC. [redacted]	[redacted]	[redacted]	11.39	[redacted] the South east Queensland bioregion. The property is situated within an area where *M. irbyana* populations are known to occur. The property supports patches of RE12.9-10.11. Areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located [redacted] and areas of *M. irbyana* habitat are connected to other potential habitats for the species. The property [redacted]				
Endangered RE12.9-10.27	120.48	[redacted]	[redacted]	102.52	[redacted] in the South east Queensland bioregion. The property is situated within an area where *M. irbyana* is known to occur. The property supports large patches of RE12.9-10.27, including remnant, HVR and unmapped regrowth. The property is strategically located [redacted] and areas of suitable habitat for M. irbyana are also connected to other potential habitats for the species and associated TEC. The property is [redacted].	[redacted]	[redacted]	58.22	[redacted] the South east Queensland bioregion. The property is situated within an area where *M. irbyana* populations are known to occur. The property supports large areas of 12.9-10.27. Areas of vegetation include remnant, HVR and unmapped regrowth. The property is strategically located [redacted] and areas of *M. irbyana* habitat are connected to other potential habitats for the species. The property is [redacted]				
Vine scrub grouping													
Brush sophora	9.44	[redacted]	[redacted]	126.35	[redacted] in the South east Queensland bioregion [redacted] Laidley. The property supports suitable habitat for the species associated with RE12.8.21. Vegetation communities consist of remnant and unmapped regrowth. The property is [redacted] State significant biodiversity corridor.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Black-breasted button quail	36.72	[redacted]	[redacted]	221.18	[redacted] in the South east Queensland bioregion [redacted]. The property provides suitable habitat for the species associated with RE12.8.21 and 12.9-10.15. Vegetation communities consist of remnant, HVR and unmapped regrowth. The property is strategically [redacted] State significant biodiversity corridor.								
Endangered RE12.8.21	9.44	[redacted]	[redacted]	126.35	[redacted] in the South east Queensland bioregion [redacted]. The property supports remnant and unmapped regrowth of RE12.8.21. The property is [redacted] State significant biodiversity corridor.								
Endangered RE12.9-10.15	25.68	[redacted]	[redacted]	94.83	[redacted] in the South east Queensland bioregion [redacted]. The property is mapped as containing areas of remnant, HVR and unmapped regrowth associated with RE12.9-10.15. The property is strategically [redacted] State significant biodiversity corridor. 12.9-10.15 is mapped in mixed polygons as the dominant RE. Therefore ground-truthing will be required to determine the extent present.								
Eucalypt woodland grouping													
Lloyd's Olive	192.12	[redacted]	[redacted]	1,742.52	[redacted] in the South east Queensland bioregion, [redacted]. The property is [redacted] State significant biodiversity corridor. The property contains large patches of RE12.9-10.2 and smaller patches of RE12.9-10.17 which are known to provide suitable habitat for Lloyd's Olive. There are records of the species [redacted] in similar vegetation communities.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Spotted-tailed quoll	131.88	[redacted]	[redacted]	794.99	The property is located in the South east Queensland bioregion, [redacted] The property [redacted] The property contains patches of RE12.3.3, 12.3.3d, and larger patches of 12.9-10.17 which are known to provide suitable habitat for Spotted-tailed quoll. There are records of the species [redacted].								
Collared delma	1169.20	[redacted]	[redacted]	772	The property is located in the South east Queensland bioregion, [redacted] The property contains large tracts of remnant woodlands, HVR woodlands and unmapped regrowth associated with REs 12.3.3, 12.9-10.2, 12.9-10.7, 12.9-10.5a. These communities are known to provide suitable habitat for the species. There are records of the species [redacted]	[redacted]	[redacted]	886.00	The property is located in the South east Queensland bioregion [redacted] The property contains large patches of remnant RE12.9-10.2 and RE12.9-10.5 which are known to support the species. There is also approximately 10 ha of regrowth. There are records of Collared Delma [redacted]				
Red goshawk	325.60	[redacted]	[redacted]	1,415.62	The property is located in the South east Queensland bioregion [redacted] The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d, and large patches of 12.9-10.2 which are known to provide suitable habitat for Red Goshawk. There [redacted] including riparian woodlands with potential to support populations of the species.								
Swift parrot	100.32	[redacted]	[redacted]	2,146.84	The property is located in the South east Queensland bioregion, [redacted] The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and large patches of 12.9-10.2 which are known to provide suitable habitat for Swift parrot.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Brush-tailed rock wallaby	19.52	[redacted]	[redacted]	200	The property is located in the South east Queensland bioregion, [redacted] The property is [redacted] The property contains suitable habitat for the species associated with REs12.9-10.3 and 12.9-10.6. These RE's are within mixed polygons so the extent of suitable habitat will need to be ground-truthed.								
Koala	1521.44	[redacted]	[redacted]	1,180.95	The property is located in the South east Queensland bioregion, [redacted] The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and areas of RE12.8.16 which are known to provide suitable habitat for Koalas. There are a large number of Koala records [redacted] There are also a high number of records in non-remnant areas.	[redacted]	[redacted]	280	The property is located in the South east Queensland bioregion, [redacted] There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.2, 12.9-10.7 There is essential habitat for Koalas mapped on the property.	[redacted]	[redacted]	546.11	[redacted] mapped State significant biodiversity corridor. Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species.
Grey-headed flying fox	1488.36	[redacted]	[redacted]	1,180.95	The property is located in the South east Queensland bioregion [redacted] The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d, 12.9-10.17 and areas of RE12.8.16 which are known to provide suitable habitat for Grey-headed flying fox.	[redacted]	[redacted]	91.75	The property is located in the South east Queensland bioregion [redacted] There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.7. These communities are known to provide preferred foraging resources for the species.	[redacted]	[redacted]	656.21	[redacted] mapped State significant biodiversity corridor. Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species.
Australian painted snipe	199.92	[redacted]	[redacted]	67.18	The property is located in the South east Queensland bioregion, [redacted] The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d in the lower lying areas of the property adjacent to creeks which can support suitable habitat for the species.	[redacted]	[redacted]	21.30	The property is located in the South east Queensland bioregion, [redacted] There are riparian woodlands and floodplain areas that have potential to provide suitable habitat for the species associated with RE12.3.3 and 12.3.7.	[redacted]	[redacted]	56.38	[redacted] mapped State significant biodiversity corridor. The property contains some areas of remnant and HVR woodlands as well as unmapped regrowth. Potential habitat for the Australian Painted Snipe is associated with lower lying floodplains and riparian areas associated with RE12.3.3 and 12.3.7.

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Australian painted snipe (continued)		[redacted]	[redacted]	32.6	[redacted] in the South east Queensland [redacted] The property supports regrowth vegetation of RE12.3.3. These floodplain and riparian areas have potential to provide suitable habitat for the species.	[redacted]	[redacted]	96.2	[redacted] in the South east Queensland bioregion. The property contains large areas of RE12.3.3. These floodplain and riparian areas have potential to provide suitable habitat for the species. The communities include HVR and unmapped regrowth.				
Grey falcon	537.96	[redacted]	[redacted]	88.82	The property is located in the South east Queensland bioregion, [redacted]. The property is [redacted] The property contains patches of RE12.3.3, 12.3.3d in the lower lying areas of the property adjacent to creeks.	[redacted]	[redacted]	21.30	The property is located in the South east Queensland bioregion, [redacted] There are riparian woodlands that have potential to provide suitable habitat for the species associated with RE12.3.3 and 12.3.7.				
Powerful owl	605.08												
Glossy black cockatoo	469.28	[redacted]	[redacted]	189.75	[redacted] State significant biodiversity corridor. Property contains areas of remnant, HVR and unmapped regrowth including communities that provide suitable foraging habitat for the species. These are associated with RE12.8.14.	[redacted]	[redacted]	310.83	[redacted] in the South east Queensland bioregion [redacted] The property supports suitable habitat for the species associated with RE12.9-10.6 and 12.8.14. Vegetation communities consist of remnant and regrowth. The property is [redacted] State significant biodiversity corridor.				
Bailey's cypress	593.20	[redacted]	[redacted]	1,052.03	The property is located in the South east Queensland bioregion, [redacted] The [redacted] The vegetation communities on the property that are known to provide suitable habitat are; RE12.8.16 and 12.9-10.17.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Caustis blakei subsp. macrantha	41.64	[redacted]	[redacted]	232.58	The property is located in the South east Queensland bioregion, [redacted] There are large areas of eucalypt woodlands including remnant, HVR and unmapped regrowth. RE's include RE12.3.3, 12.3.7, 12.9-10.2, 12.9-10.7. These communities are known to support preferred habitat for the species.								
Short-beaked Echidna	302.84	[redacted]	[redacted]	2,146.84	The property is located in the South east Queensland bioregion [redacted] The property is [redacted] The vegetation communities on the property are known to provide suitable habitat for the Short-beaked Echidna.								
Platypus	191.08	-			Habitat availability will be assessed subsequent to field validation								
Slender milkvine	451.48	-											
Of Concern RE 12.3.8	3	[redacted]	[redacted]	0.48	[redacted] in the South east Queensland bioregion. The property is situated within an area where M. irbyana populations are known to occur. The property supports very small area of RE12.3.8. The property is [redacted] a regional corridor. The property [redacted]								
Of Concern RE 12.9-10.3	0.2	[redacted]	[redacted]	1.89	[redacted] in the South east Queensland bioregion. The property supports small patches of high value regrowth and unmapped regrowth of RE12.9-10.3. The property is [redacted]. 12.9-10.3 is mapped in as the fourth RE mixed polygons. Therefore ground-truthing will be required to determine the extent present.								

Offset value	Offset area required (ha)	Property name	Lot and Plan/s	Estimated area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments	Property name	Lot and Plan	Area available (ha)	Comments
Of Concern RE 12.9-10.7	595.68	[redacted]	[redacted]	1048.24	The property is located in the South east Queensland bioregion [redacted] The property supports remnant and unmapped regrowth of RE12.9-10.7. The property is [redacted] 12.9-10.7 is mapped in mixed polygons as a secondary RE. Therefore ground-truthing will be required to determine the extent present.								
Endangered RE12.3.3	27.44	[redacted]	[redacted]	78.97	The property is located in the South east Queensland bioregion, [redacted] The property supports remnant and unmapped regrowth of RE12.3.3. The property is [redacted] 12.3.3 is mapped in mixed polygons as a dominant RE. Therefore ground-truthing will be required to determine the extent present.								
Endangered RE12.3.3d	24.36	[redacted]	[redacted]	24.59	[redacted] to a mapped State significant biodiversity corridor. The property supports high value regrowth and unmapped regrowth of RE12.3.3d. 12.3.3d is mapped in mixed polygons. Therefore ground-truthing will be required to determine the extent present.								
Endangered RE12.3.18	30.16	[redacted]	[redacted]	8.25	[redacted] the South east Queensland bioregion. The property supports areas of remnant, HVR and unmapped regrowth RE12.3.18. The property [redacted] State significant biodiversity corridor. [redacted]								
Of concern RE12.9-10.16	18.32	-											

6 Offset partnerships

ARTC is committed to achieving enduring and meaningful conservation outcomes through the delivery of environmental offsets in the local regions where impacts occur. ARTC will seek to establish and foster working partnerships with key organisations who can assist in the delivery of environmental offsets and provide value adds such as social benefits by involving local communities.

Partnerships may include:

- Securing and managing land for conservation
- Revegetation and restoration
- Targeted pest and weed management programs
- Education and raising awareness of key biodiversity values in the local regions of the project
- Research associated with key threatened species and or vegetation communities.

Options for offset partnerships are being explored and will be outlined in greater detail in the Environmental Offset Proposals.

ARTC is also seeking to maximise the social and community benefits of the environmental offset investments by working with relevant Aboriginal groups, local government, community groups, Natural Resource Management Catchment Groups and conservation organisations to support both the site selection process, and the ongoing management and monitoring of these offset sites. ARTC has commenced consultation with stakeholder groups and will continue to do so through the project approval and offset process to explore these opportunities.

7 Next steps

ARTC is committed to providing environmental offsets for significant residual impacts to MNES and those MSES and MLES that are not assessed under the Commonwealth framework. The EO Act does not affect or limit the functions and powers of the Coordinator-General under the SDPWO Act, however ARTC will have regard to the principles of the QEOP in determining and implementing offset requirements for MSES and MLES.

Land-based offsets that comply with the EPBC Act Environmental Offsets Policy will form the initial focus for delivering the project's Queensland environmental offset requirements. Land-based offsets will be strategically located and co-locate a number of the project's MNES, MSES and MLES offset requirements. Larger offset sites will be preferentially identified that contain sufficient area of the required values to meet the total Queensland Inland Rail project requirements.

This Strategy applies across all relevant Queensland projects. While the offset properties identified under this Strategy are preliminary, further offset site optimisation on revised MNES, MSES and MLES impact information will be subsequently undertaken in order to generate an up to date offset property portfolio. Landholder engagement and ground-truthing will need to occur to assist finalising offset sites and total offset areas required.

Project specific Environmental Offset Proposals will be finalised by the end of January 2021 to identify the likely environmental offset requirements at a project level. An Environmental Offset Delivery Plan will be prepared during 2021 outlining the final offset package to be delivered for all Queensland projects once all offset requirements are determined.

Regular communication and progress updates will be provided to government agencies including seeking feedback on proposed offset sites and conservation outcomes to be achieved. Specifically, this will include the following key steps:

- Undertake further offset site optimisation on revised MNES, MSES and MLES impact information to generate an up to date offset feasibility assessment.
- Undertake additional seasonal ecological assessments within target areas of the project alignment to progress the understanding of validated impacts on MNES, MSES and MLES including assessing habitat quality for future offset site condition comparison.
- Continue to consult with DAWE and OCG on the proposed approach for the assessment and delivery of environmental offsets for Queensland projects.
- Consult with stakeholders to identify opportunities for collaboration and partnerships.
- Select potential offset properties that contain the required offset values across Queensland projects and engage with landowners as early as possible to understand options available.
- Finalise a shortlist of preferred offset sites and begin preliminary ground truthing. Ground-truthing will include validation of the presence of offset values, confirming suitability of the site, assessing habitat quality and determining management actions.
- Prepare required documentation according to Figure 2, Staging Offset Assessment and Delivery, at key milestones to gain regulator feedback and endorsement of the offset package.

8 References

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Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2012). *Environment Protection and Biodiversity Conservation Act 1999 –Environmental Offsets Policy.* Commonwealth Government.

Department of State Development and Infrastructure Planning (DSDIP) (2014) *Significant Residual Impact Guideline for projects that require an authority under the Sustainable Planning Act 2009*. State of Queensland, Department of State Development, Infrastructure and Planning.

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