

PEMBROKE

Olive Downs Coking Coal Project

Additional Information to the
Environmental Impact Statement

Appendix F

Biodiversity Offset Strategy

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1 PROJECT OVERVIEW

Pembroke Olive Downs Pty Ltd (Pembroke) proposes to develop the Olive Downs Coking Coal Project (herein referred to as the Project), a metallurgical coal mine and associated infrastructure within the Bowen Basin, located approximately 40 kilometres (km) south-east of Moranbah, Queensland (Figure 1). The Project provides an opportunity to develop an open cut metallurgical coal resource within the Bowen Basin mining precinct that can deliver up to 20 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal.

The Project comprises the Olive Downs South and Willunga mining domains and associated linear infrastructure corridors, including a Rail Spur connecting to the Norwich Park Branch Railway, a water pipeline connecting to the Eungella pipeline network, an electricity transmission line (ETL) and access roads (Figures 2 and 3). The coal resource would be mined by conventional open cut mining methods, with product coal to be transported by rail to the Dalrymple Bay Coal Terminal.

The four key Project components were referred to the Commonwealth Department of Environment and Energy (DEE) via separate referrals on 24 January 2017, namely (Figure 4):

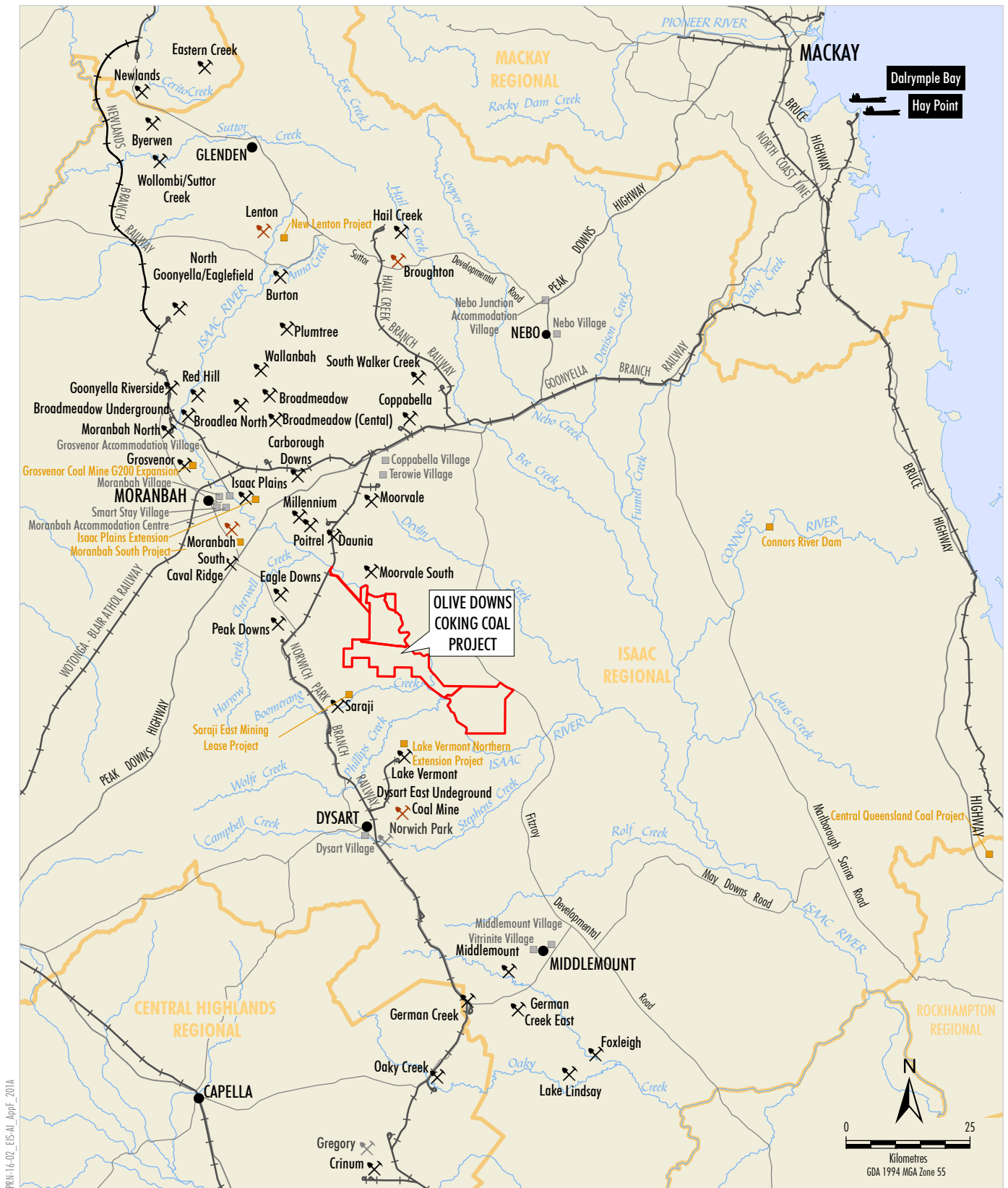
- Olive Downs Project Mine Site and Access Road (EPBC 2017/7867) (herein referred to as the Mine Site and Access Road);
- Olive Downs Project Water Pipeline (EPBC 2017/7868) (herein referred to as the Water Pipeline);
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869) (herein referred to as the Project ETL); and
- Olive Downs Project Rail Spur (EPBC 2017/7870) (herein referred to as the Rail Loop and Spur).

On 3 March 2017 the four key Project components were determined to be 'Controlled Actions' requiring assessment and approval under the EPBC Act. The following controlling provisions apply for each proposed action under the EPBC Act:

- Mine Site and Access Road;
 - listed threatened species and communities (sections 18 and 18A);
 - listed migratory species (sections 20 and 20A);
 - a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E).
- Water Pipeline;
 - listed threatened species and communities (sections 18 and 18A);
- Project ETL;
 - listed threatened species and communities (sections 18 and 18A); and
- Rail Spur and Loop;
 - listed threatened species and communities (sections 18 and 18A).

In December 2017, Pembroke lodged an application to vary the Mine Site and Access Road and the Water Pipeline to incorporate the latest Project layout designs. These variations were accepted by the DEE on 17 April 2018.

Should Pembroke, in the future, decide to transfer the responsibility of the Water Pipeline, Rail Spur and Loop and/or Project ETL to another company (e.g. SunWater, Aurizon or Ergon), all relevant EPBC Act approvals would also need to be transferred.

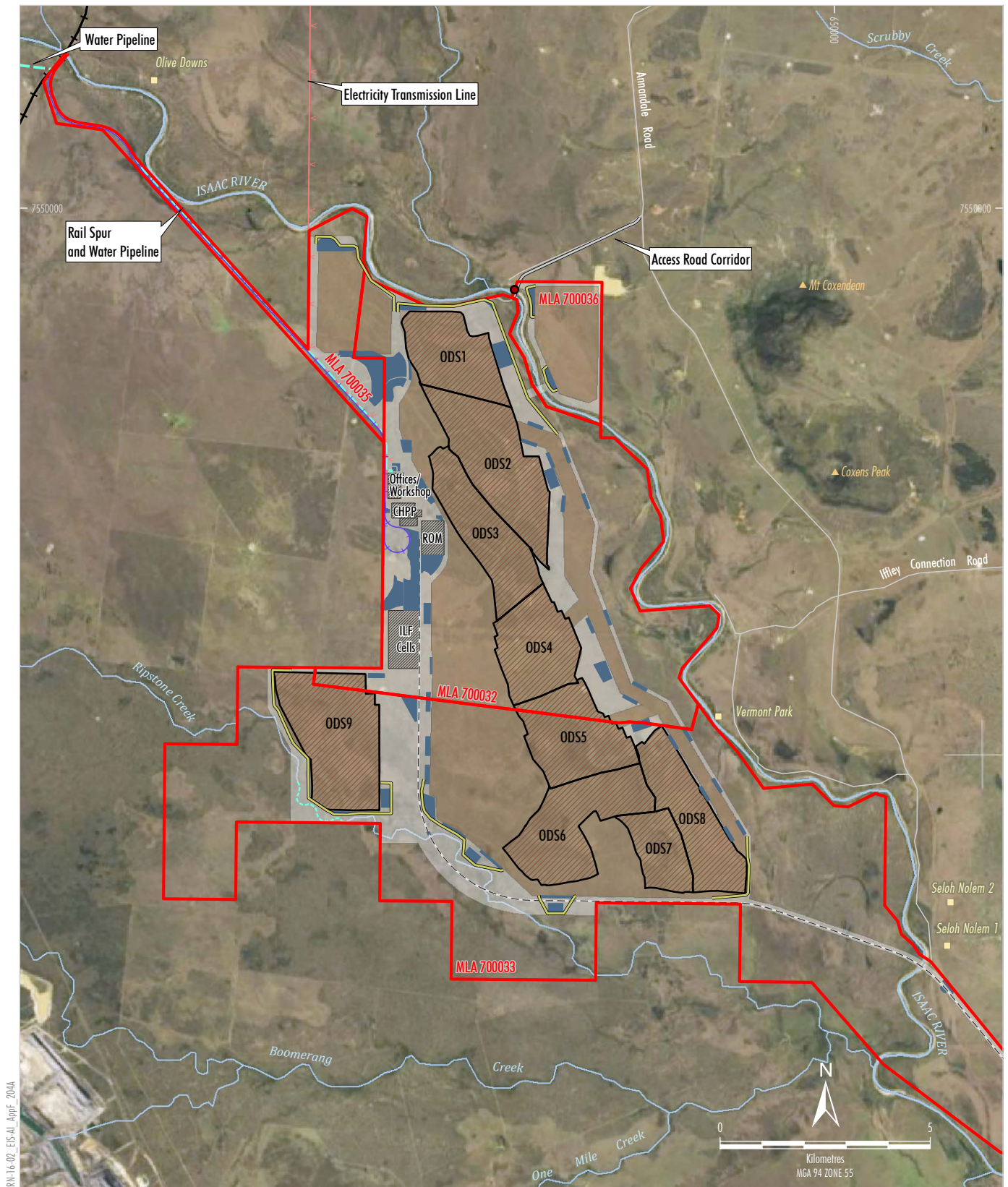


- LEGEND**
- Mining Lease Application Boundary
 - Local Government Area
 - Major Road
 - ++ Railway
 - Port
 - Approved/Operating Coal Mine
 - Proposed Coal Mine
 - Under Care and Maintenance
 - Workforce Accommodation Facility
 - Coordinated, Major and Other Relevant Project

Source: Geoscience Australia - Topographical Data 250K (2006);
Department of Natural Resources and Mines (2016)

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OLIVE DOWNS COKING COAL PROJECT
Regional Location

Figure 1



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- LEGEND**
- Mining Lease Application Boundary
 - Railway
 - Dwelling
 - Proposed Access Road
 - Proposed Electricity Transmission Line
 - Proposed Rail Spur and Loop
 - Proposed Water Pipeline
 - Proposed Creek Diversion
 - Open Cut Pit Extent (and Pit Numbering)
 - Out-of-Pit and In-Pit Waste Rock Emplacement
 - Infrastructure Area

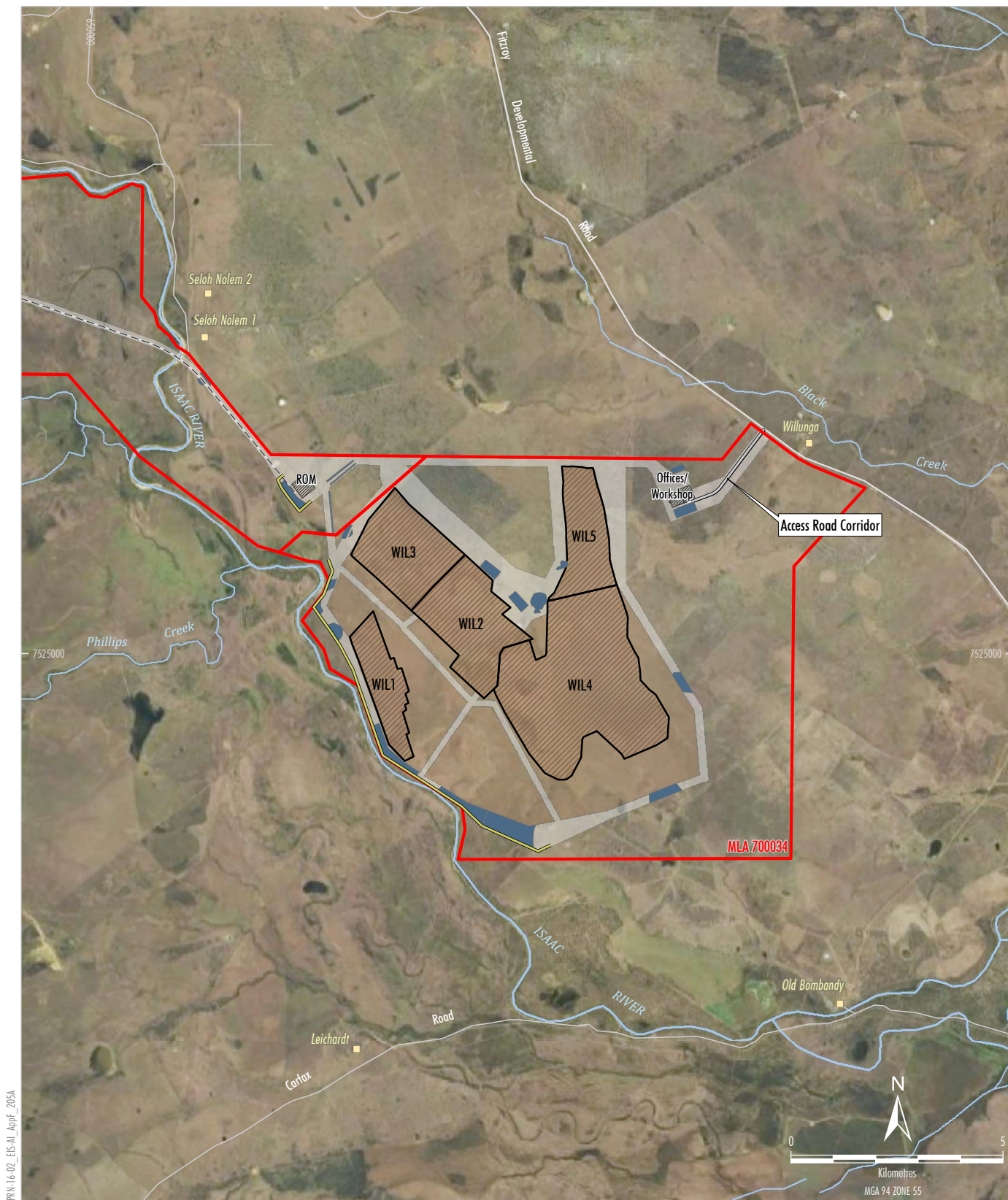
- Key Infrastructure Component
- Water Storage
- Temporary Levee
- Overland Conveyor
- Olive Downs Water Pump

Source: Geoscience Australia - Topographical Data 250K (2006)
Department of Natural Resources and Mines (2016)
Orthophotography: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
General Arrangement -
Olive Downs South Domain

Figure 2



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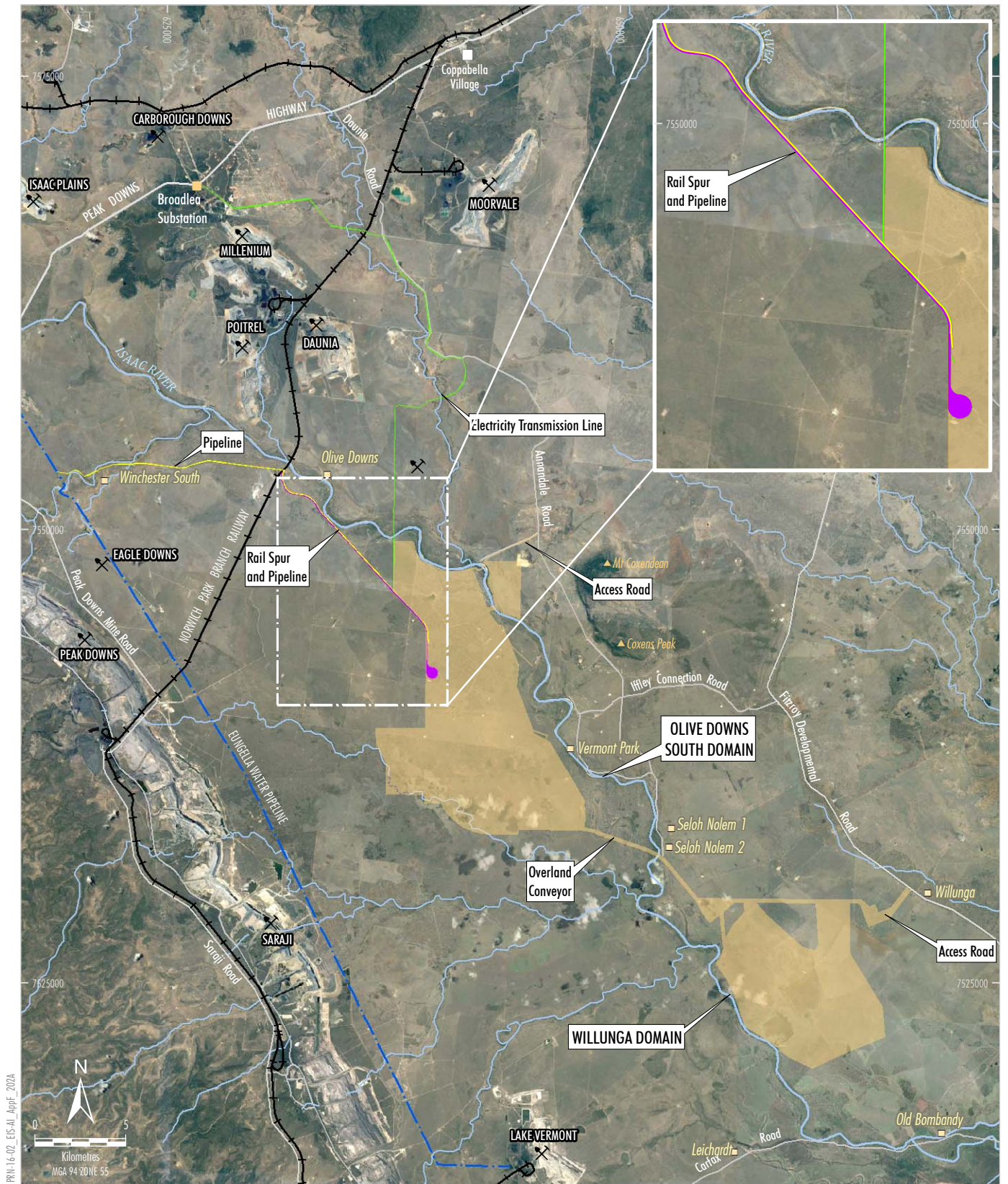
- LEGEND**
- Mining Lease Application Boundary
 - Dwelling
 - Open Cut Pit Extent (and Pit Numbering)
 - Out-of-Pit and In-Pit Waste Rock Emplacement
 - Infrastructure Area
 - Temporary Levee
 - Water Storage
 - Overland Conveyor
 - Key Infrastructure Component

Source: Geoscience Australia - Topographical Data 250K (2006)
 Department of Natural Resources and Mines (2016)
 Orthophotography: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
General Arrangement -
Willunga Domain

Figure 3



2 PROJECT STAGES

The overall extent of surface disturbance (clearance) associated with the Project (herein referred to as the Project area) is approximately 16,300 hectares (ha). This comprises a disturbance footprint of approximately 16,100 ha for the Mine Site and Access Road, approximately 56 ha for the Water Pipeline, approximately 40.5 ha for the Project ETL, approximately 103 ha for the Rail Spur and Loop. Land clearing and development for the Project is proposed to be undertaken in four distinct stages as shown in Table 1 (Figure 5).

Table 1
Approximate Disturbance Extent for Stages 1 to 4

Project Stage ¹	Approximate Disturbance Extent (ha)	Percentage of Overall Project Impact
Stage 1 (2019 to 2024)	1,755	11%
Stage 2 (2025 to 2030)	4,250	26%
Stage 3 (2031 to 2050)	7,435	45%
Stage 4 (2051 to end of mine)	2,860	18%

¹ Refer to Figure 5.

2.1 STAGE 1

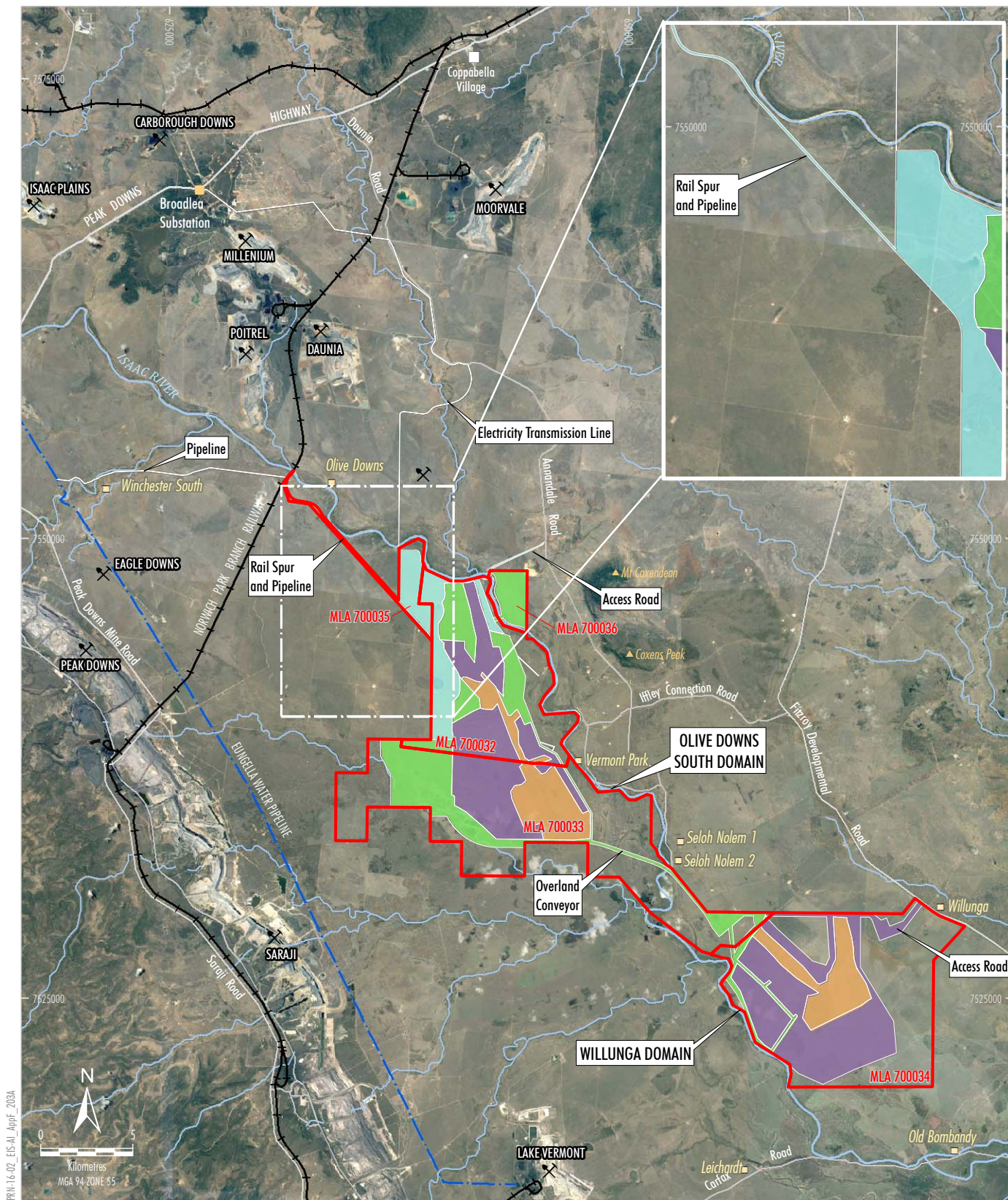
The Stage 1 disturbance extent is approximately 1,755 ha and is shown on Figure 5. Stage 1 includes the following works:

- construction of each of the infrastructure corridors:
 - Olive Downs Project Water Pipeline (EPBC 2017/7868);
 - Olive Downs Project Electricity Transmission Line (EPBC 2017/7869);
 - Olive Downs Project Rail Spur (EPBC 2017/7870); and
 - Olive Downs South access road;
- construction of the mine infrastructure area (including offices, workshops, coal handling and processing plant [CHPP], ROM pad, In-line Flocculation [ILF] cells);
- development of the north-western waste emplacement;
- construction of temporary flood levees located within the Stage 1 boundary; and
- commencement of open cut mining in Pit 1.

In addition to the above, the Stage 1 disturbance boundary would facilitate approximately the first five years of mining of the Olive Downs Project Mine Site and Access Road (EPBC 2017/7867).

Further information on the development of each of the four Actions and associated potential impacts to matters of national environmental significance (MNES) is provided in Section 3.

A detailed description of the Stage 1 Offset Area is provided in Section 4.



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- LEGEND**
- Mining Lease Application Boundary
 - Approved/Operating Coal Mine
 - Eungella Pipeline Network
 - Railway
 - Dwelling
 - Indicative Mine Stage
 - Stage 1
 - Stage 2
 - Stage 3
 - Stage 4

Source: Pembroke (2018); Department of Natural Resources and Mines (2018); Orthophotography; Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Indicative Mine Stages
for Biodiversity Offset

Figure 5

2.2 STAGES 2 TO 4

Stages 2 to 4 of the Project involve the ongoing construction and operations associated with the Olive Downs Project Mine Site and Access Road (EPBC 2017/7867). The extent of disturbance associated with Stages 2 to 4 is detailed in Table 1 and shown on Figure 5.

For Stages 2 to 4 of the Project, a biodiversity offset would be provided before the commencement of each stage. It is likely that the residual significant adverse impacts can be offset given the following:

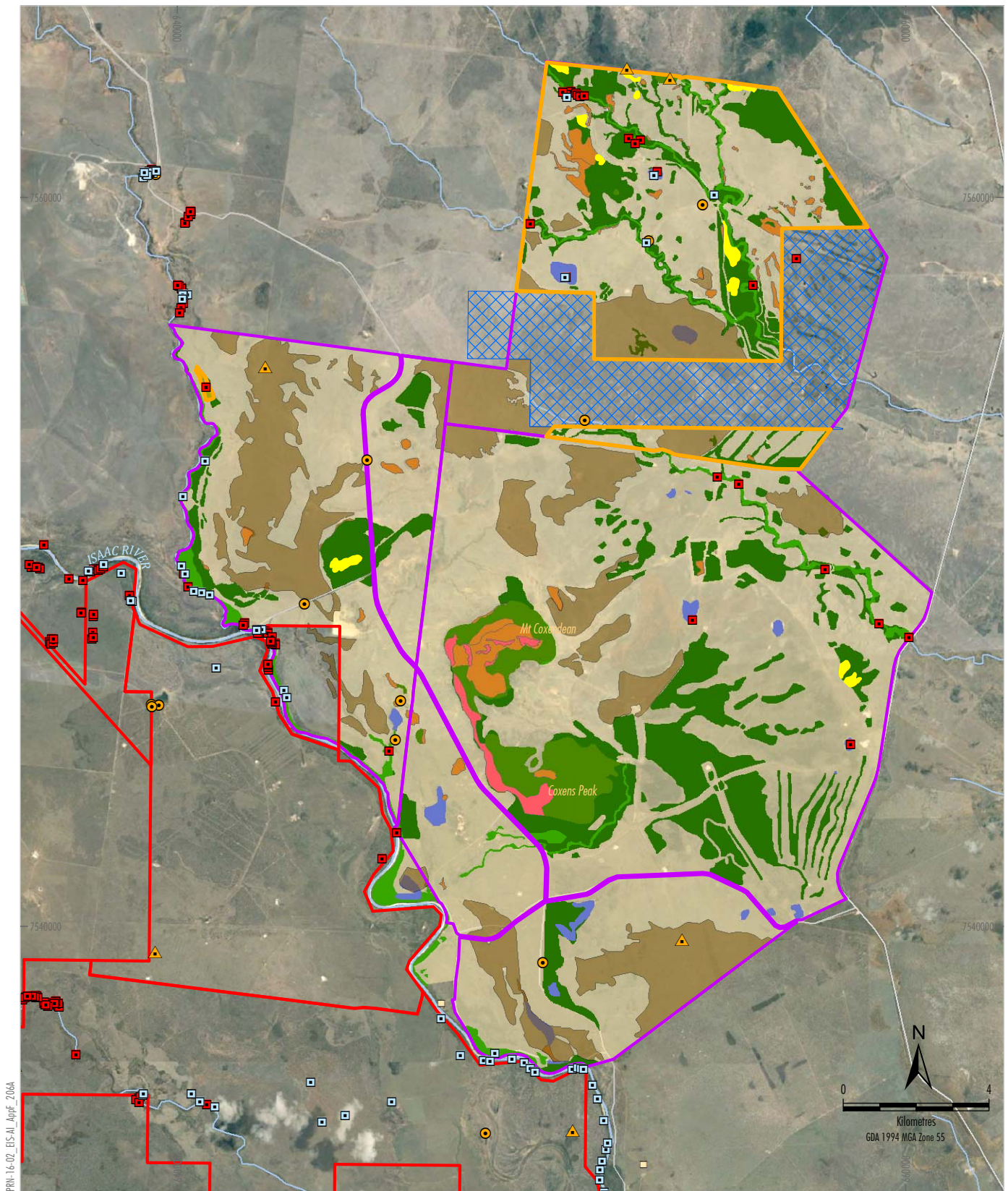
- The native vegetation communities/fauna habitats to be cleared during the life of the Project (including the Brigalow EEC) all occur more extensively in the surrounding landscape and subregions, as demonstrated by the availability of habitat for each MNES shown on Figure 6.
- The Ornamental Snake, Squatter Pigeon [southern], Australian Painted Snipe, Greater Glider and Koala (and their habitats) are widely distributed in the surrounding landscape and region, as demonstrated by the availability of habitat for each species shown on Figure 6.
- Wetland habitats are mapped as occurring widely in the surrounding locality as shown on Figure 6.

Pembroke owns three landholdings in the vicinity of the Project, which will be considered and assessed as biodiversity offsets for the future stages of the Project (i.e. Stages 2 to 4). These include:

- the Twenty Mile property;
- the Iffley property; and
- the Deverill property.

The total combined area of these three properties is approximately 34,000 ha. Although some of this land is being proposed as a biodiversity offset for Stage 1 of the Project, the remaining land could be available for future stages. It should be noted that there is an existing Mineral Development Licence (MDL 3023) on a portion of the Twenty Mile property. This area has been excluded from the Stage 1 Offset Area but may also become available for offsetting purposes in the future. Pembroke is currently in negotiations with respect to a potential land-swap regarding a portion of these additional areas.

For subsequent stages, a detailed assessment of the impact of each stage of the Project and the offset requirement for each stage would be conducted prior to providing an updated Offset Management Plan to DEE for that stage. The offset would be provided before the commencement of each stage.



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- LEGEND**
- Mining Lease Application Area
 - Pembroke Owned Properties
 - Stage 1 Biodiversity Offset Area
 - MDL 3023
 - Ground Truthed Broad Vegetation Group**
 - Eucalypt open forest to woodlands on floodplains (habitat for Koala, Greater Glider and Squatter Pigeon)
 - Eucalypt dry woodlands on inland depositional plains (habitat for Koala, Greater Glider and Squatter Pigeon)
 - Eucalypt woodlands to open forests
 - Palustrine wetlands (habitat for Australian Painted Snipe, Koala and Greater Glider)
 - Acacia dominated open forests, woodlands and shrublands
 - Lacustrine wetlands (habitat for Australian Painted Snipe)
 - Rainforests and scrubs
 - Regrowth Vegetation
 - Light to medium clay with gilgai (habitat for ornamental snake)
 - Brigalow TEC
 - Threatened Species Records (Common Name)**
 - ▲ Ornamental Snake
 - Koala
 - Greater Glider
 - Australian Painted Snipe
 - Squatter Pigeon

Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Presence of MNES on Pembroke Owned Properties

Figure 6

3 ASSESSMENT OF IMPACTS ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

3.1 ECOLOGY SURVEYS AND ASSESSMENT

Flora Surveys

DPM Envirosiences (2018a) undertook flora surveys within an area covering the Project area and land outside the Project area that may be subject to potential indirect impacts (the Study area) in accordance with the following relevant survey guidelines:

- *Queensland Flora Survey Guidelines – Protected Plants* (DEHP, 2014a); and
- *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al., 2017).

A spring flora survey was conducted within the Study area from 22-30 November 2016 and again from 26-30 September and 14-20 November 2017. A follow-up autumn flora survey was conducted from 7-9 March 2017 and from 30 May to 10 June 2017.

Seasonal surveys were undertaken to maximise detection of threatened flora species that may occur in the Study area, based on the desktop assessment. The rationale for survey timing was to conduct surveys at a time when the majority of targeted species would have reproductive material (to aid in identification) (DPM Envirosiences, 2018a).

Fauna Surveys

DPM Envirosiences (2018b) (Appendix B of the EIS) undertook fauna surveys within the Study area in accordance with the following relevant survey guidelines (DPM Envirosiences, 2018b):

- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al., 2014);
- *EPBC Act Survey Guidelines for Australia's Threatened Reptiles* (DEWHA, 2011a);
- *EPBC Act Survey Guidelines for Australia's Threatened Birds* (DEWHA 2010a);
- *EPBC Act Survey Guidelines for Australia's Threatened Bats* (DEWHA 2010b);
- *EPBC Act Survey Guidelines for Australia's Threatened Mammals* (DEWHA, 2011b);
- *EPBC Act Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* (DSEWPac, 2011);
- *EPBC Act Referral Guidelines for the Vulnerable Koala* (DotE, 2014); and
- *Targeted Species Survey Guidelines – Yakka Skink* (Ferguson and Mathieson, 2014).

A comprehensive fauna survey was undertaken from 1-14 November 2016, 23 April to 4 May 2017, 7-14 May 2017, 4-9 September 2017 and 14-20 November (DPM Envirosiences, 2018b). This is consistent with the seasonal survey requirements detailed in the *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland* (Eyre et al., 2014).

3.2 ASSESSMENT OF SIGNIFICANT RESIDUAL IMPACT

DPM Envirosciences (2018a, b and c) conducted significant impact assessments in accordance with the significant impact criteria detailed in the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (DotE, 2013) for each MNES identified as having the potential to occur in the Project area based on the results of the field surveys (Section 3.1). As a result of the assessments, it was determined that the Project would result in a significant residual impact to the following MNES (DPM Envirosciences, 2018a and b):

- Brigalow endangered ecological community (EEC) – approximately 13 ha to be cleared;
- Ornamental Snake – approximately 7,666 ha of potential habitat to be cleared (comprised entirely of Important Habitat for this species);
- Australian Painted Snipe – approximately 120 ha of potential habitat to be cleared (comprised entirely of potential breeding habitat for this species);
- Squatter Pigeon – approximately 5,610 ha of potential habitat to be cleared (comprised largely of potential breeding habitat, with small pockets of potential foraging and dispersal habitat);
- Koala – approximately 5,583.5 ha of potential habitat to be cleared (comprised entirely of Critical Habitat for the Koala); and
- Greater Glider – approximately 5,583.5 ha of potential habitat to be cleared (comprised entirely of potential breeding/foraging habitat).

The significant impact assessment concluded that there are no flora species listed under the EPBC Act likely to be significantly impacted by the Project (DPM Envirosciences, 2018a).

3.3 OLIVE DOWNS PROJECT MINE SITE AND ACCESS ROAD (EPBC 2017/7867)

The construction program for the Mine Site and Access Road is iterative and individual construction work packages would be delivered over an extended period of time of approximately 13 years, to enable the production rate to reach 20 Mtpa.

Initially, construction activities, including early works, are anticipated to commence approximately 18 months to two years in advance of the planned operations. The works would commence as soon as the relevant planning approvals, EA and mining lease tenements (where required) are granted.

Further construction activities would occur after approximately 10 years to allow the full development rate at the Olive Downs South domain to be achieved. This would involve expansion of the CHPP, workshops and the ILF cells.

Finally, construction activities would be conducted at the Willunga domain, following the establishment of operations at the full development rate at the Olive Downs South domain and approximately 12 months in advance of the planned commencement of operations at the Willunga domain.

At this point, the Mine Site and Access Road infrastructure would be capable of delivering up to 20 Mtpa.

The ultimate extent of the Mine Site and Access Road would result in the removal of threatened ecological communities and habitat for fauna species listed under the EPBC Act, consisting of (DPM Envirosciences, 2018a):

- Brigalow EEC – approximately 13 ha (represented by RE11.4.9);
- Ornamental Snake – approximately 7,621.5 ha of habitat (comprised entirely of Important Habitat for this species);

- Australian Painted Snipe – approximately 113 ha of habitat (comprised entirely of potential breeding habitat for this species);
- Squatter Pigeon – approximately 5,530 ha of habitat (comprised largely of potential breeding habitat, with small pockets of potential foraging and dispersal habitat);
- Koala – approximately 5,500 ha of habitat (comprised entirely of Critical Habitat for the Koala); and
- Greater Glider – approximately 5,500 ha of habitat (comprised entirely of potential breeding/foraging habitat).

A breakdown of impacts on MNES associated with each stage of the Project is provided in Section 3.7.

3.4 OLIVE DOWNS PROJECT WATER PIPELINE (EPBC 2017/7868)

A raw (external supply) Water Pipeline (approximately 23 km long) would be constructed for the Project from the existing Eungella water pipeline network (the Eungella Pipeline Southern Extension).

The Water Pipeline would be constructed during the first Stage of the Project.

Vegetation clearance for the Water Pipeline would be restricted to a 20 m wide corridor, which would run directly adjacent the Rail Spur and loop for a distance of 15 km from the mine site to the existing Norwich Park Branch to minimise vegetation clearance.

The Water Pipeline would require the clearance of potential habitat for threatened fauna species listed under the EPBC Act, consisting of (DPM Envirosiences, 2018b):

- Ornamental Snake – approximately 7 ha of habitat (comprised entirely of Important Habitat for this species);
- Australian Painted Snipe – approximately 1 ha of habitat (comprised entirely of potential breeding habitat for this species);
- Squatter Pigeon – approximately 23 ha of habitat (comprised largely of potential breeding habitat, with small pockets of potential foraging and dispersal habitat);
- Koala – approximately 28.5 ha of habitat (comprised entirely of Critical Habitat for the Koala); and
- Greater Glider – approximately 28.5 ha of habitat (comprised entirely of potential breeding/foraging habitat).

No Brigalow EEC would be impacted by the Water Pipeline (DPM Envirosiences, 2018a).

A breakdown of impacts on MNES associated with each stage of the Project is provided in Section 3.7.

3.5 OLIVE DOWNS PROJECT ELECTRICITY TRANSMISSION LINE (EPBC 2017/7869)

Electricity supply for the Project is to be provided from the existing regional power network, via construction of a 66 kilovolt (kV) ETL from the Broadlea Substation (approximately 42 km in length), and an on-site switching/substation.

The Project ETL would be constructed during the first Stage of the Project.

The Project ETL has been designed to utilise existing easements and public roads to the maximum extent possible. Where this is not possible, vegetation clearance would be restricted to a 10 m wide corridor to minimise vegetation clearance.

The Project ETL would require the clearance of potential habitat for threatened fauna species listed under the EPBC Act, consisting of (DPM Envirosiences, 2018b):

- Ornamental Snake – approximately 10.5 ha of habitat (comprised entirely of Important Habitat for this species);
- Squatter Pigeon – approximately 14 ha of habitat (comprised largely of potential breeding habitat, with small pockets of potential foraging and dispersal habitat);
- Koala – approximately 12 ha of habitat (comprised entirely of Critical Habitat for the Koala); and
- Greater Glider – approximately 12 ha of habitat (comprised entirely of potential breeding/foraging habitat).

No patches of Brigalow EEC listed under the EPBC Act would be removed by the Project ETL (DPM Envirosiences, 2018b).

A breakdown of impacts on MNES associated with each stage of the Project is provided in Section 3.7.

3.6 OLIVE DOWNS PROJECT RAIL SPUR (EPBC 2017/7870)

The Project would include the construction of the Rail Spur from the Norwich Park Branch Railway and rail loop adjacent to the rail-loadout facility at the Olive Downs South Domain.

The Rail Spur and Loop would be constructed during the first Stage of the Project.

Vegetation clearance for the Rail Spur would run directly adjacent to the water pipeline to minimise vegetation clearance.

The Rail Spur would require the clearance of potential habitat for threatened fauna species listed under the EPBC Act, consisting of (DPM Envirosiences, 2018a):

- Ornamental Snake – approximately 27 ha of habitat (comprised entirely of Important Habitat for this species);
- Australian Painted Snipe – approximately 6 ha of habitat (comprised entirely of potential breeding habitat for this species);
- Squatter Pigeon – approximately 43 ha of habitat (comprised largely of potential breeding habitat, with small pockets of potential foraging and dispersal habitat);
- Koala – approximately 43 ha of habitat (comprised entirely of Critical Habitat for the Koala); and
- Greater Glider – approximately 43 ha of habitat (comprised entirely of potential breeding/foraging habitat).

The Rail Spur was designed to avoid impacts to Brigalow EEC. As such, no Brigalow EEC would be impacted by the Rail Spur (DPM Envirosiences, 2018a).

A breakdown of impacts on MNES associated with each stage of the Project is provided in Section 3.7.

3.7 SUMMARY

Table 2 quantifies the significant residual impacts on MNES for each stage of clearance for each Action. The Stage 1 Offset Area is proposed to be established to compensate for these significant residual impacts and is described in the following sections. It has been concluded that the removal of habitat for each MNES, as outlined in Table 2, would result in a significant residual impact to these matters.

Table 2
Residual Significant Impact on MNES

MNES	Approximate Area of Clearance in Stage 1 (ha)					Stage 2	Stage 3	Stage 4	Total Project Impact	Significant Residual Impact Likely?*
	Mine Site and Access Road	Water Pipeline*	Project ETL*	Rail Spur*	Total Stage 1					
Brigalow EEC	0	0	0	0	0	0	13	0	13	Yes
Ornamental Snake	461.5	7	10.5	27	506	1,596	3,916	1,648	7,666¹	Yes
Australian Painted Snipe	14	1	0	6	21	24	50	25	120²	Yes
Squatter Pigeon	743	23	14	43	823	1,757	2,284	746	5,610³	Yes
Koala	743	28.5	12	43	826.5	1,762	2,261	734	5,583.5⁴	Yes
Greater Glider	743	28.5	12	43	826.5	1,762	2,261	734	5,583.5⁵	Yes

* Refer to Table 9 for the reconciliation of Stage 1 impacts against the availability of biodiversity offsets for each MNES.

Source: DPM Envirosciences (2018a and b).

¹ This is comprised entirely of 'Important Habitat' for the Ornamental Snake.

² This is comprised entirely of potential breeding habitat for the Australian Painted Snipe.

³ This is comprised of approximately 3,628 ha of breeding habitat, approximately 1,822 ha of foraging and approximately 160 ha of dispersal habitat.

⁴ This is comprised entirely of 'Critical Habitat' for the Koala.

⁵ This is comprised entirely of potential breeding/foraging habitat for the Greater Glider.

4 STAGE 1 OFFSET AREA

Pembroke proposes to offset the significant residual impacts on MNES in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPC, 2012).

Pembroke proposes a staged approach to the delivery of environmental offset requirements in consideration of the staged land clearing described in Section 2. The offset for each stage of clearance would be provided prior to clearing commencing for the relevant stage. A land-based proponent-driven offset is proposed to address the relevant impacts from Stage 1.

For subsequent stages, a detailed assessment of the impact of each stage of the Project and the offset requirement for each stage would be conducted prior to providing an updated Offset Management Plan to DEE for that stage. The offset would be provided before the commencement of each stage.

The Stage 1 Offset Area would compensate for the impacts associated with each of the following Actions in full:

- Olive Downs Project Water Pipeline (EPBC 2017/7868);
- Olive Downs Project Electricity Transmission Line (EPBC 2017/7869); and
- Olive Downs Project Rail Spur (EPBC 2017/7870).

In addition, the Stage 1 Offset Area will compensate for the impacts associated with approximately the first five years of the Olive Downs Mine Site and Access Road (EPBC 2017/7867) (Section 2).

Overall, the Stage 1 Offset Area would compensate for approximately 11% of the total impacts associated with the Project. The proposed offset strategy for Stages 2 to 4 of the Project is outlined in Section 5.

4.1 GENERAL DESCRIPTION OF THE STAGE 1 OFFSET AREA

4.1.1 LOCATION

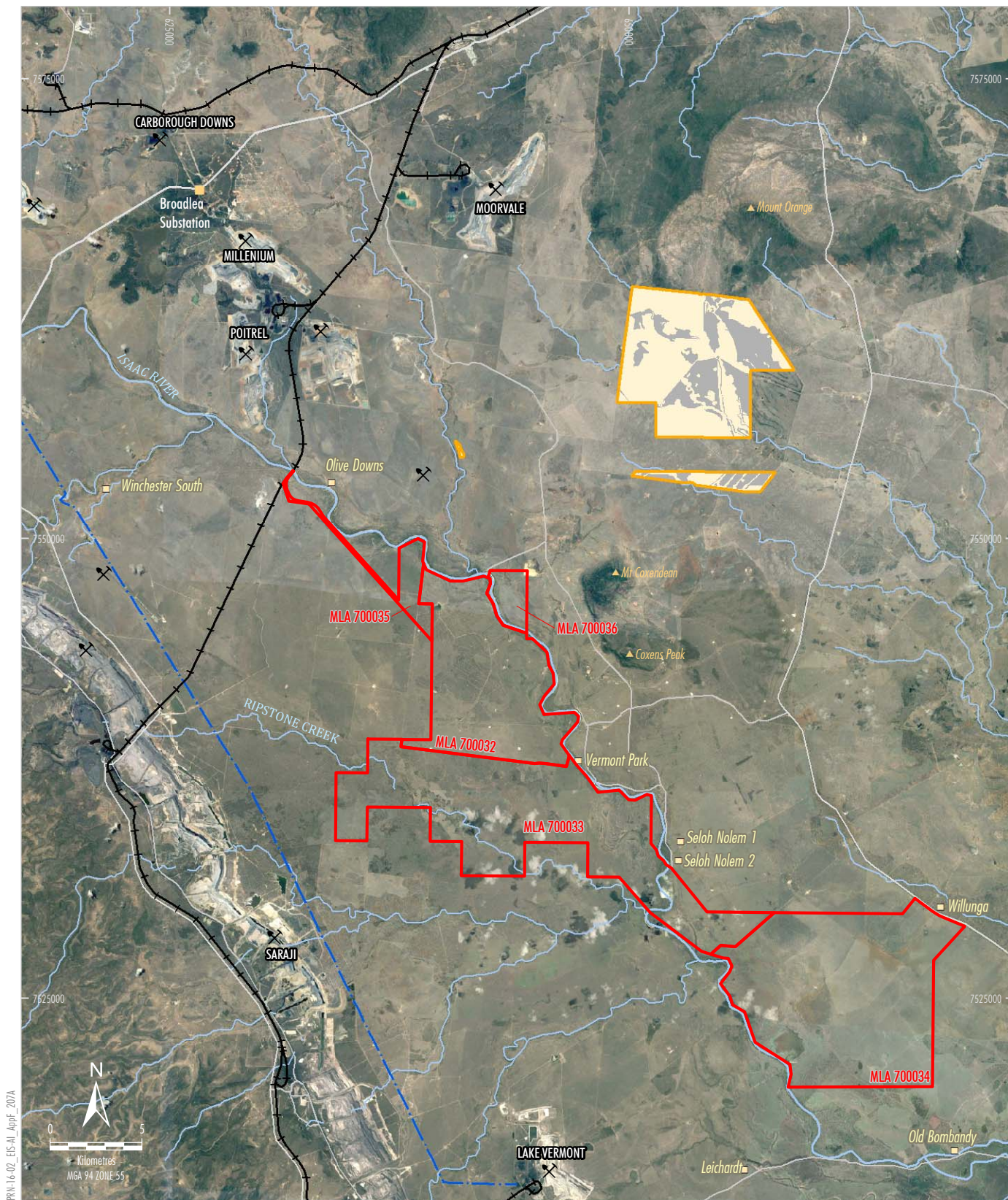
The Stage 1 Offset Area is comprised of three distinct areas located on the eastern side of the Isaac River, adjacent to the Project area (Figure 7). The Stage 1 Offset Area occurs within the same subregion and catchment as the Project.

The Stage 1 Offset Area covers an overall area of approximately 6,065 ha. Within the Stage 1 Offset Area, there is approximately 1,200 ha which is not required to be included in an offset area for Stage 1 and may be used to offset impacts from subsequent stages. These areas are mapped on Figure 8 as 'Areas Retained for Future Offset'. Despite retaining these areas to account for future stages, these areas would be conserved and managed as part of the greater Stage 1 Offset Area.

Pembroke owns the land on which the Stage 1 Offset Area is proposed and there are no other relevant parties with registered interests under the Qld *Land Act 1994* or the Qld *Land Title Act 1994* (Table 3).

Table 3
Relevant Offset Area Details

Reference	Landholder Details
Registered Owner on Title	Pembroke Olive Downs Pty Ltd
Real Property Descriptions	Twenty Mile – Lot 5, SP 113322 Deverill – Lot 18, SP 113322



PRU-16-02_EIS-AL_AppF_207A

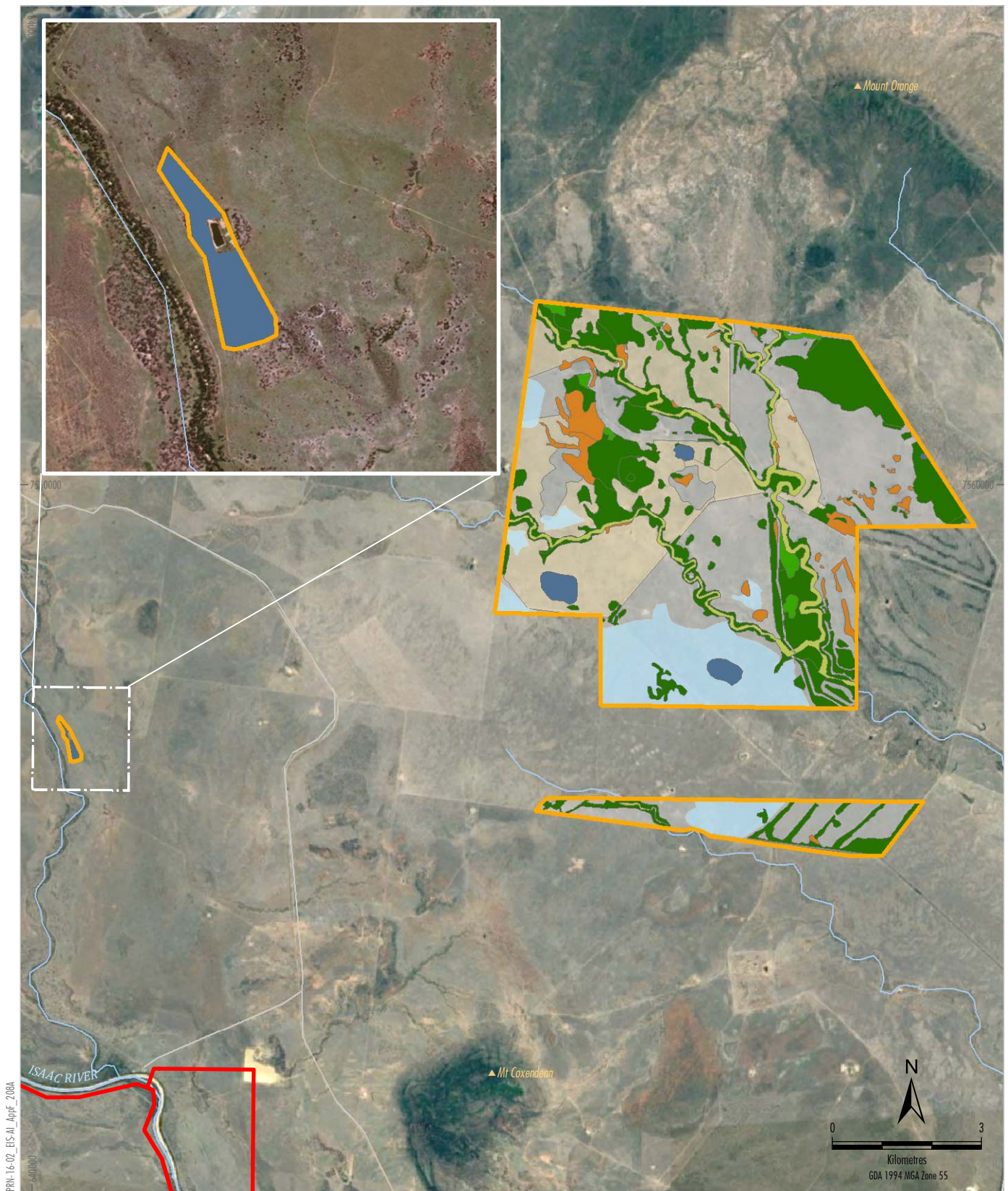
- LEGEND**
- Mining Lease Application Boundary
 - Stage 1 Biodiversity Offset Area
 - Approved/Operating Coal Mine
 - Dwelling
 - Eungella Pipeline Network
 - Railway
 - Areas Retained for Future Offset

Source: Geoscience Australia - Topographical Data 250K (2006)
Queensland Department of Natural Resources and Mines (2016)
Orthophotography: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Stage 1 Biodiversity Offset Area

Figure 7



LEGEND	
 	Mining Lease Application Boundary
 	Stage 1 Biodiversity Offset Area
▲	Peaks
■	Dwelling
Matters of National Environmental Significance	
	Brigalow TEC
	Light to medium clay with gilgai
	Eucalypt dry woodlands on inland depositional plains
	Eucalypt open forests to woodlands on floodplains
	Palustrine wetlands
	Acacia dominated open forests, woodlands and shrublands
	Eucalypt dominated regrowth
	Areas Retained for Future Offset

Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Broad Fauna Habitat Types
Stage 1 Offset Area

Figure 8

4.1.2 LAND USE HISTORY

Land within the Stage 1 Offset Area is used predominately for cattle grazing, with small areas showing some evidence of opportunistic cropping. The land has been largely cleared through past agricultural practices, however, some tracts of remnant vegetation remain. In accordance with the field survey, approximately 60% of the Stage 1 Offset Area comprises cleared agricultural grasslands and unmapped regrowth, with the remainder of the area mapped as remnant vegetation.

4.2 ECOLOGY SURVEYS OF THE STAGE 1 OFFSET AREA

4.2.1 SURVEY METHODS

Threatened Fauna Surveys

DPM Envirosiences (2018b) undertook terrestrial fauna surveys in the Stage 1 Offset Area in accordance with the relevant State and Commonwealth survey guidelines. The fauna surveys were undertaken in March 2018. The detailed methods and findings from these surveys are provided in Appendix H of DPM Envirosiences (2018b).

Survey methods included spotlighting, diurnal bird surveys, active searches, searches for scats and other signs, and habitat assessments. Targeted searches for threatened fauna species listed under the EPBC Act (including the Koala, Greater Glider, Ornamental Snake, Australian Painted Snipe and Squatter Pigeon) were also conducted (DPM Envirosiences, 2018b).

Habitat for each of the target threatened species was mapped in the Stage 1 Offset Area during the surveys.

Flora and Vegetation Surveys

DPM Envirosiences (2018a) undertook flora surveys in the Stage 1 Offset Area in accordance with contemporary survey guidelines. The flora and vegetation surveys were undertaken in March to May 2018. The detailed methods and findings from these surveys are provided in Appendix H of DPM Envirosiences (2018b).

Terrestrial flora survey techniques included ground-truthing regional ecosystems using quaternary level assessment in accordance with the Queensland Herbarium vegetation survey methods described in Neldner et al. (2017), terrestrial habitat quality assessment in accordance with the *Guide to Determining Terrestrial Habitat Quality* (DEHP, 2017), identification of threatened ecological communities (TECs), and random meander searches for threatened flora species listed under the EPBC Act.

4.2.2 PRESENCE OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The regional ecosystems ground-truthed within the Stage 1 Offset Area are listed in Table 4. Ten vegetation communities were identified, with RE 11.5.9 (Least Concern), RE 11.5.3 (Least Concern) and RE 11.3.2 (Of Concern) being the most commonly occurring communities.

A combination of remnant vegetation and regrowth eucalypt woodland within the Stage 1 Offset Area has been mapped as potential habitat for five fauna species listed under the EPBC Act required to be offset within Stage 1 (Figure 8). The remnant vegetation within the Stage 1 Offset Area is described in Table 4. The regrowth eucalypt woodland is generally less than 15 m in height and estimated to be less than 20 years old. It was noted that all areas of regrowth had high levels of weeds, and would benefit from active management.

Table 4
Ground-truthed Regional Ecosystems within the Stage 1 Offset Area

Regional Ecosystem	Conservation Status ¹		Area (ha)
	VM Act	EPBC Act	
RE 11.3.1 Brigalow (<i>Acacia harpophylla</i>) and / or Belah (<i>Casuarina cristata</i>) open forest on alluvial plains.	E	Some patches represent the Brigalow EEC ²	30
RE 11.3.2 Poplar Box (<i>Eucalyptus populnea</i>) woodland on alluvial plains.	OC	-	505
RE 11.3.25 Forest Red Gum (<i>Eucalyptus tereticornis</i>) or River Red Gum (<i>E. camaldulensis</i>) woodland fringing drainage lines.	LC	-	219
RE 11.3.27f Palustrine wetland, Coolabah (<i>Eucalyptus coolabah</i>) and / or Forest Red Gum (<i>E. tereticornis</i>) open woodland to woodland fringing swamps.	LC	-	23
RE 11.4.8 Dawson Gum (<i>Eucalyptus cambageana</i>) woodland to open forest with Brigalow (<i>Acacia harpophylla</i>) or blackwood (<i>A. argyrodendron</i>) on Cainozoic clay plains.	E	Some patches represent the Brigalow EEC ²	73
RE 11.4.9 Brigalow (<i>Acacia harpophylla</i>) shrubby woodland with Yellowwood (<i>Terminalia oblongata</i>) on Cainozoic clay plains.	E	Some patches represent the Brigalow EEC ²	154.5
RE 11.5.3 <i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	LC	-	418.5
RE 11.5.9 <i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains and/or remnant surfaces			451
RE 11.5.17 Palustrine swamp with fringing Forest Red Gum (<i>Eucalyptus tereticornis</i>) woodland in depressions on Cainozoic sand plains and remnant surfaces.	E	-	63.5
RE 11.1.1 <i>Sporobolus virginicus</i> grassland on marine clay plains			12.5
Remnant Vegetation			1,950
Non-Remnant Vegetation			4,115
Total			6,065

Source: Appendix A.

¹ Conservation Status – E = Endangered; OC = Of Concern; NCP = No Concern at Present; LC = Least Concern.

² Patches of Brigalow EEC are shown on Figure 8.

The regrowth vegetation would be managed by Pembroke in order to increase the quality. This would also provide further connectivity of the existing habitats to surrounding vegetation, including the riparian corridor along the Isaac River, which currently provides a movement corridor and refuge habitat for these species.

Should monitoring indicate that the natural regeneration is not progressing towards remnant status, Pembroke would undertake revegetation activities to assist in this process.

The following threatened fauna species were all recorded during targeted fauna surveys in the Stage 1 Offset Area:

- Ornamental Snake;
- Squatter Pigeon (southern);
- Koala; and
- Greater Glider.

Suitable habitat for each of these species, in addition to the Australian Painted Snipe, occurs in the Stage 1 Offset Area as described below.

4.2.3 ORNAMENTAL SNAKE

The Ornamental Snake prefers habitat that is close to its prey (primarily frogs). It prefers moist woodlands and open forests, particularly gilgai mounds as well as lake margins and wetlands (DEE, 2018). It is found in low-lying subtropical areas with deep-cracking clay soils and persists in cleared, disturbed habitat, particularly where brigalow communities have been cleared (DSEWPC, 2011).

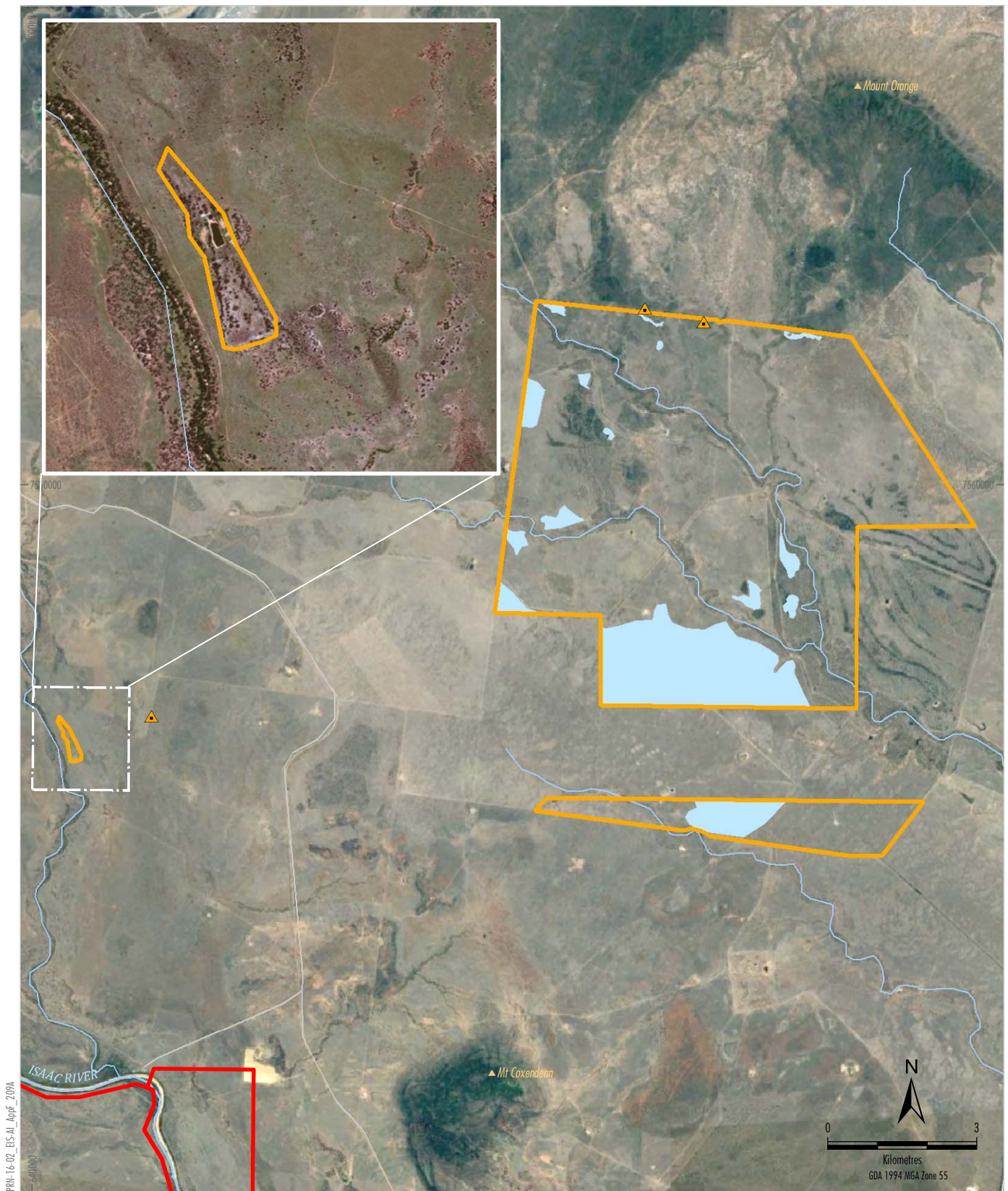
Two Ornamental Snakes were recorded during nocturnal spotlighting in the Stage 1 Offset Area (Figure 9). Desktop mapping produced by GT Environmental (2018) across the Study area identified areas of gilgai relief, which are the most accurate reflection of potential habitat for this species.

Based on observations of Ornamental Snake habitat across the Project area and the Stage 1 Offset Area, areas of potential habitat occur in a significant portion of agricultural grasslands (where there was once brigalow), as well as small patches of palustrine wetlands (swamps) and acacia-dominated open forests, woodlands and shrublands where these soil types are also present (Figure 9).

The areas mapped on Figure 9 as potential habitat for the Ornamental Snake also contain woody debris (which would provide sheltering habitat for the Ornamental Snake when cracks are not available), are low-lying, and during the wet season would hold water long enough for frogs to inhabit them, providing a food source for the Ornamental Snake.

As the majority of the potential habitat for this species is mapped within the agricultural grasslands, there are a number of existing threats to the Ornamental Snake. These include weed infestation, presence of introduced fauna species (including cane toads), agricultural grazing and habitat fragmentation.

Table 5 also provides a breakdown of the habitat types available within the Stage 1 Offset Area for the Ornamental Snake.



Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
 Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Threatened Species Habitat Mapping
Ornamental Snake

Figure 9

Table 5
Ornamental Snake Habitat Breakdown

Habitat Type	Habitat Descriptions (as per DEE's SPRAT profile)	Stage 1 Offset Area
Important Habitat	Known important habitat is defined in Table 2 of the Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DSEWPC, 2011) as " <i>gilgai depressions and mounds, and habitat connectivity between gulgais and other suitable habitats</i> ", particularly where the species has been recorded during survey (DSEWPC, 2011).	<p>Within the Stage 1 Offset Area it was determined that all areas of mapped gilgai represent potential important habitat for the Ornamental Snake (including brigalow TEC within the gilgai), as do wetland REs 11.3.27 and 11.5.17 because the species was recorded on several occasions within these habitats across the Project area and offset study area.</p> <p>Areas of potential habitat connectivity are likely represented by brigalow TEC's and REs 11.3.1, 11.4.8, 11.4.9 and 11.9.1 outside the gilgai area, as well as all remnant vegetation that forms part of a continuous link between the gilgai formations, wetland REs and brigalow REs, with the exception of Land Zone 10 (sandstone ranges).</p> <p>A total of 854 ha of important habitat for the Ornamental Snake has been mapped across the Stage 1 Offset Area (Figure 9).</p>
Suitable Habitat	Suitable habitat is defined in Table 2 of the Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DSEWPC, 2011) as "open-forests to woodlands associated with gilgai formations and wetlands. These are commonly mapped as REs 11.3.3, 11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.5.16 or mapped as cleared but where the above REs formerly occurred".	Given that the Ornamental Snake was recoded within the habitat in the Stage 1 Offset Area, and that it was determined that all areas of mapped gilgai represent potential important habitat for this species, no additional areas of suitable habitat are present.
Dispersal/Connective Habitat	The SPRAT profile does not provide a definition of dispersal habitat for this species.	<p>Dispersal habitat for this species has not been mapped within the Stage 1 Offset Area given:</p> <ul style="list-style-type: none"> there is no definition of dispersal habitat for this species on the SPRAT; and habitat that allows connectivity between gulgais and other suitable habitat has also be considered to be important.

Source: DPM Envirosiences (2019).

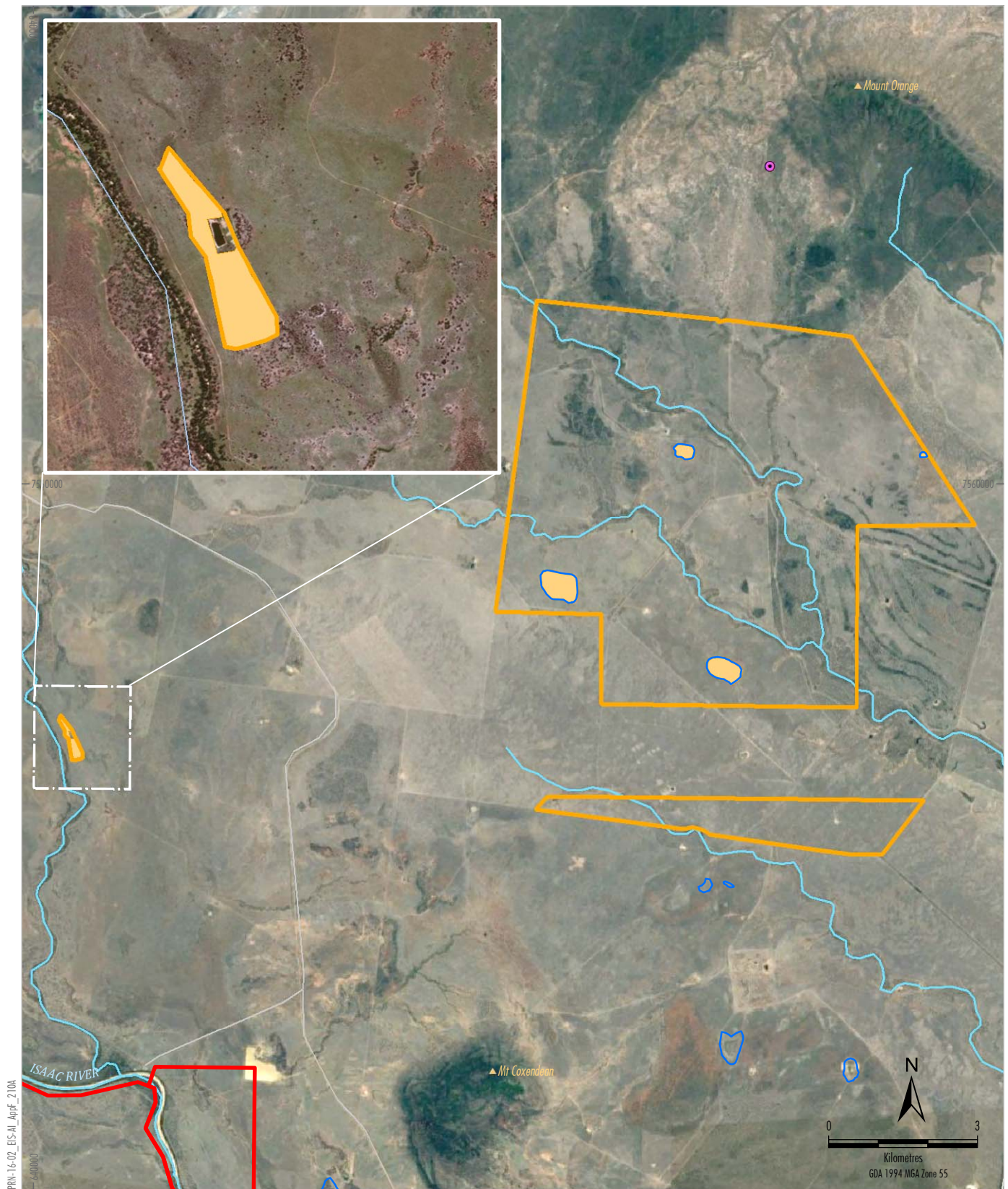
As demonstrated in Table 5, all potential habitat for the Ornamental Snake within the Stage 1 Offset Area meets the definition of Important Habitat for this species. This is consistent with the potential habitat within the Stage 1 Project Area (i.e. it is also comprised entirely of Important Habitat).

4.2.4 AUSTRALIAN PAINTED SNIPE

The Australian Painted Snipe generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire (DEE, 2018).

No Australian Painted Snipe were observed during the field surveys. Records of this species within the broader locality are from waterways or wetlands (including gilgai), with the closest being approximately 5 km north (Figure 10). Within the Stage 1 Offset Area all areas of wetlands (lacustrine or palustrine) are considered potential habitat for this species (Figure 10).

Table 6 also provides a breakdown of the habitat types available within the Stage 1 Offset Area for the Australian Painted Snipe.



Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
 Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Threatened Species Habitat Mapping
Australian Painted Snipe

Figure 10

Table 6
Australian Painted Snipe Habitat Breakdown

Habitat Type	Habitat Descriptions (as per DEE's SPRAT profile)	Stage 1 Offset Area
Breeding habitat	<p>This species requires suitable wetland areas even in drought conditions. The species can move to suitable habitat if necessary (Marchant & Higgins 1993).</p> <p>Breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and dense low cover and sometimes some tall dense cover nearby, particularly on or near small muddy islands or mounds surrounded by water in freshwater wetlands (DEE, 2019, Threatened Species Scientific Committee [TSSC], 2013). Nest records are all, or nearly all, from or near small islands in freshwater wetlands (D. Rogers 2002, pers. comm.), provided that these islands are a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (Rogers et al., 2005).</p>	<p>Within the Stage 1 Offset Area, it was determined that all areas of lacustrine and palustrine wetlands (including palustrine wetland REs 11.3.27 and 11.5.17) represent potential breeding habitat for the Australian Painted Snipe, particularly as water levels are expected to change seasonally, with islands or mounds and bare earth exposed.</p> <p>A total of 86 ha of breeding habitat for the Australian Painted Snipe has been mapped across the Stage 1 Offset Area (Figure 10).</p>
Foraging habitat	<p>The Australian Painted Snipe eats vegetation, seeds, insects, worms and molluscs, crustaceans and other invertebrates (Marchant & Higgins 1993).</p> <p>The species may have quite specific foraging habitat requirements, but these are not well understood and further study is required (DEE, 2019).</p> <p>They generally remain in dense cover when feeding, although may forage over nearby mudflats and other open areas such as ploughed land or grassland (Marchant & Higgins 1993). This species requires suitable wetland areas even in drought conditions.</p>	<p>The Stage 1 Offset Area does not contain any foraging habitat that would not also provide the potential for breeding (i.e. breeding habitat). As outlined in DPM Envirosiences (2019), the gilgai habitat would only be suitable for a short period after rainfall when the gilgai are full and would not provide suitable habitat during drought conditions. In addition, these areas do not possess the dense cover required by this species for foraging.</p>
Dispersal habitat	<p>The SPRAT profile does not provide a definition of dispersal habitat for this species.</p>	<p>Dispersal habitat for this species has not been mapped within the Stage 1 Offset Area area given:</p> <ul style="list-style-type: none"> • There is no definition of dispersal habitat for this species on the SPRAT; and • This species does not require specific habitat features to assist it in dispersing.

Source: DPM Envirosiences (2019).

As demonstrated in Table 6, all potential habitat for the Australian Painted Snipe within the Stage 1 Offset Area meets the definition of potential breeding habitat for this species. This is consistent with the potential habitat within the Stage 1 Project Area (i.e. it is also comprised entirely of potential breeding habitat).

4.2.5 SQUATTER PIGEON (SOUTHERN)

The Squatter Pigeon (southern) has a large distribution extending from the Burdekin-Lynd divide in Central Queensland, west to Charleville and Longreach, east to the coastline between Proserpine and Port Curtis (near Gladstone) and south to a number of scattered sites throughout south-eastern Queensland (DEE, 2019). All of the relatively small isolated and sparsely distributed sub-populations occurring south of the Carnarvon Ranges in Central Queensland are considered to be important subpopulations of the subspecies (DEE, 2018).

The Squatter Pigeon (southern) was identified in various habitats on two occasions within the Stage 1 Offset Area and a further four locations within close proximity (Figure 11). The Squatter Pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts (DEE, 2018). Within the Stage 1 Offset Area all areas of eucalypt dry woodlands on inland depositional plains and eucalypt open forests to woodlands on floodplains are considered potential habitat for this species. Potential habitat mapping for the Squatter Pigeon (southern) within the Stage 1 Offset Area is presented as Figure 11.

Other broad habitat types (i.e. rainforests and scrubs, wetlands, acacia forests and agricultural grasslands) were not considered potential habitat because they do not support the grassy understorey with the high density of native grasses necessary to provide food resources for this species and the canopy shelter and microhabitat for this species.

Table 7 also provides a breakdown of the habitat types available within the Stage 1 Offset Area for the Squatter Pigeon (Southern).

Table 7
Squatter Pigeon (Southern) Habitat Breakdown

Habitat Type	Habitat Descriptions (as per DEEs SPRAT Profile)	Stage 1 Offset Area
Breeding habitat	<ul style="list-style-type: none"> • Land Zones 5 & 7 and 3, 4 & 10) <ul style="list-style-type: none"> ○ Remnant or regrowth open-forest to sparse, open-woodland or low-woodland dominated by <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species within <u>one kilometre</u> of a suitable, permanent or seasonal waterbody. It is distinguished by ground-layer vegetation that: <ul style="list-style-type: none"> ▪ consists of patchy, native, perennial tussock grasses, or a mix of perennial tussock grasses and low shrubs or forbs; and ▪ does not cover more than 33% of the ground. ○ These preferred ground-layer vegetation conditions tend to occur on well-draining, sandy or gravelly soils low, gently sloping, flat to undulating plains and foothills, lateritic (duplex) soils on low 'jump-ups' and escarpments. 	<p>Within the Stage 1 Offset Area, it was determined that RE's and the areas of more advanced regrowth vegetation (i.e. lower abundance of native species in the early stages of development) on land zones 3, 4, 5, 7 and 10 (where within 1 km of a suitable, permanent or seasonal waterbody) provide potential breeding habitat for the Squatter Pigeon (southern).</p> <p>Those RE's (both remnant and regrowth) that were excluded are:</p> <ul style="list-style-type: none"> • REs 11.10.8 and 11.12.7. The occurrence of these REs within the Stage 1 Offset Area were recorded as having a dense vine thicket understorey which limited the availability of native, perennial tussock grasses required by this species. • RE's 11.9.1, 11.10.3 and 11.11.1. The occurrence of these REs within the Stage 1 Offset Area possess dense shrub layer precluding the presence of a grassy understorey. • REs 11.3.27 and 11.5.17. The occurrence of these REs within the Stage 1 Offset Area have wetted groundcover and do not possess well-draining, sandy or gravelly soils. • REs 11.3.1, 11.3.1b, 11.4.8 and 11.4.9. The occurrences of these REs within the Stage 1 Offset Area contain cracking clay soils (i.e. not sandy or gravelly soils on low, gently sloping, flat to undulating plains and foothills, lateritic (duplex) soils) <p>A total of 1,811 ha of breeding habitat for the Squatter Pigeon (southern) has been mapped across the Stage 1 Offset Area (Figure 11).</p>

Table 7 (Continued)
Squatter Pigeon (Southern) Habitat Breakdown

Habitat Type	Habitat Descriptions (as per DEES SPRAT Profile)	Stage 1 Offset Area
Foraging habitat	<ul style="list-style-type: none"> • Land Zones 5 & 7 and 3, 4 & 10) <ul style="list-style-type: none"> ○ Remnant or regrowth open-forest to sparse, open-woodland or low-woodland dominated by <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species within <u>three kilometres</u> of a suitable, permanent or seasonal waterbody. It is distinguished by ground-layer vegetation that: <ul style="list-style-type: none"> ▪ consists of patchy, native, perennial tussock grasses, or a mix of perennial tussock grasses and low shrubs or forbs; and ▪ does not cover more than 33% of the ground. ○ These preferred ground-layer vegetation conditions tend to occur on well-draining, sandy or gravelly soils on low, gently sloping, flat to undulating plains and foothills, lateritic (duplex) soils on low 'jump-ups' and escarpments. 	<p>Within the Stage 1 Offset Area, it was determined that RE's and the areas of more advanced regrowth vegetation (i.e. lower abundance of weeds and higher abundance of native species in the early stages of regrowing) on land zones 3, 4, 5, 7 and 10 (where between 1 km and 3 km of a suitable, permanent or seasonal waterbody) provide potential foraging habitat for the Squatter Pigeon (southern).</p> <p>Those RE's (both remnant and regrowth) that were excluded are:</p> <ul style="list-style-type: none"> • REs 11.10.8 and 11.12.7. The occurrence of these REs within the Stage 1 Offset Area were recorded as having a dense vine thicket understorey which limited the availability of native, perennial tussock grasses required by this species. • RE's 11.9.1, 11.10.3 and 11.11.1. The occurrence of these REs within the Stage 1 Offset Area possess dense shrub layer precluding the presence of a grassy understorey. • REs 11.3.27 and 11.5.17. The occurrence of these REs within the Stage 1 Offset Area have wetted groundcover and do not possess well-draining, sandy or gravelly soils. • REs 11.3.1, 11.3.1b, 11.4.8 and 11.4.9. The occurrences of these REs within the Stage 1 Offset Area contain cracking clay soils (i.e. not sandy or gravelly soils low, gently sloping, flat to undulating plains and foothills, lateritic (duplex) soils) <p>A total of 1,452.5 ha of foraging habitat for the Squatter Pigeon (southern) has been mapped across the Stage 1 Offset Area (Figure 11).</p>
Dispersal habitat	<ul style="list-style-type: none"> ○ Dispersal habitat is any forest or woodland occurring between patches of foraging or breeding habitat that facilitates movement between patches of foraging habitat, breeding habitat and/or waterbodies. ○ Dispersal habitat includes vegetation where the groundcover layer has been thinned through current land-use practices in a way that suits the species (e.g. light cattle grazing). The species does disperse into highly modified or degraded habitats, including cleared areas that are within 100 metres of remnant trees or patches of habitat. 	<p>Additional areas of dispersal habitat for the Squatter Pigeon (southern) have been mapped within the Stage 1 Offset Area. These comprise all remnant vegetation and areas of lower quality regrowth vegetation (i.e. areas that contain a high abundance of weeds and low abundance of native species in the early stages of regrowing, no greater than 100 m wide) between areas of breeding/foraging habitat.</p> <p>A total of 297.5 ha of dispersal habitat for the Squatter Pigeon (southern) has been mapped across the Stage 1 Offset Area (Figure 11).</p>

Source: DPM Envirosciences (2019).

As demonstrated in Table 7, the majority of the potential habitat for the Squatter Pigeon (southern) within the Stage 1 Offset Area meets the definition of potential breeding habitat for this species. There are also additional areas of potential foraging and dispersal habitat for this species. This is consistent with the potential habitat within the Stage 1 Project Area (i.e. it is largely potential breeding habitat with small patches of potential foraging and dispersal habitat).

4.2.6 KOALA

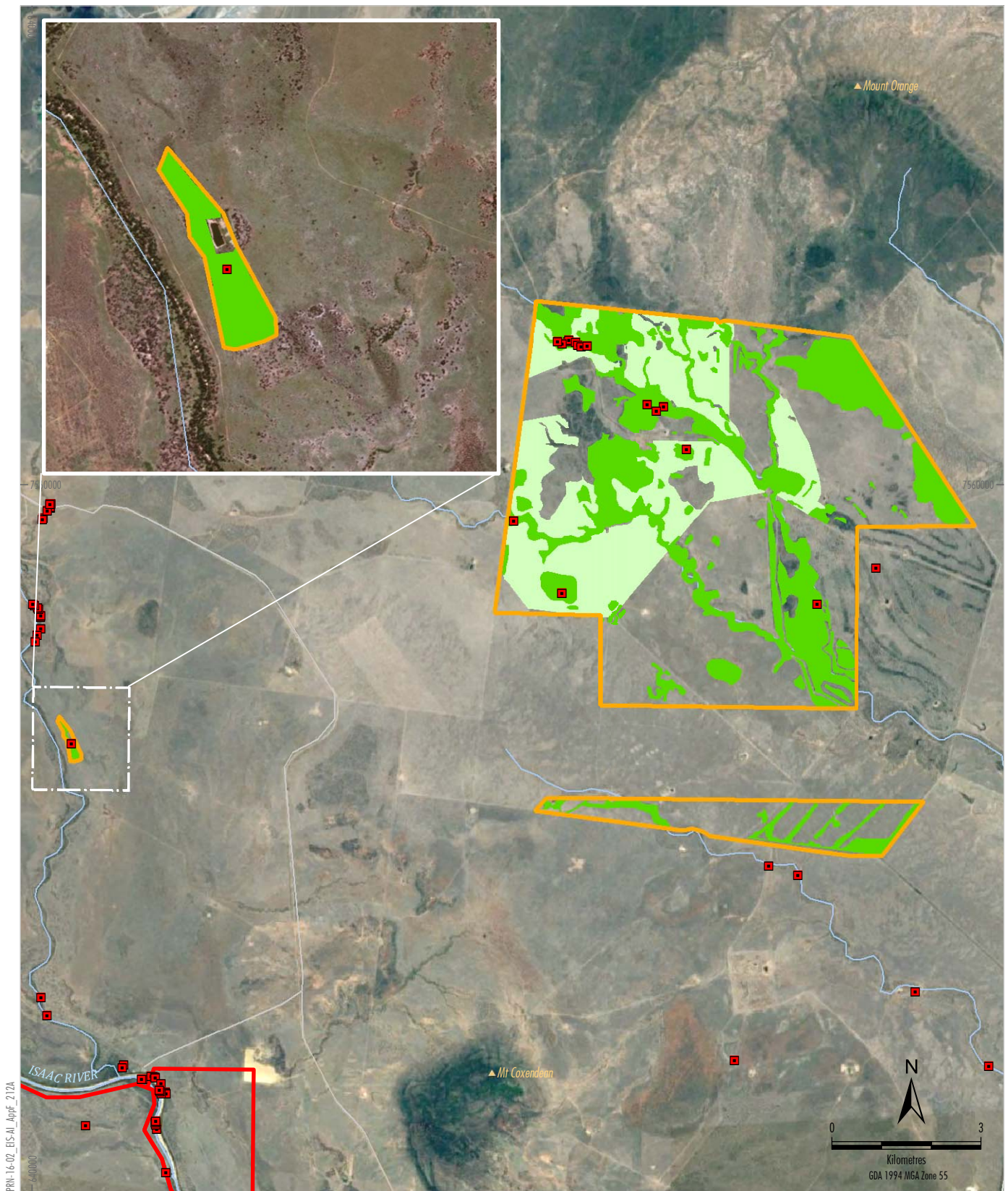
The Koala has one of the largest distributions of any terrestrial threatened species listed under the EPBC Act (DotE 2014). It occupies a variety of vegetation types across this large distribution, is capable of moving long distances, and is variably affected by a range of threats (DEE, 2019). Koala habitat is defined by the vegetation community present and the vegetation structure; Koalas do not necessarily have to be present (DotE, 2014). Any forest or woodland containing species that are known Koala food trees, or shrubland with emergent food trees can be considered as 'potential Koala habitat' (DEE, 2018). This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala food trees can generally be considered to be those of the genus *Angophora*, *Corymbia*, *Eucalyptus*, *Lophostemon* and *Melaleuca* (DEE, 2018).

Within the Study area, the Koala was recorded on numerous occasions along drainage features and within woodland habitats (Figure 12). Recordings included direct observation and identification of scats and scratches within Eucalypt dry woodlands on inland depositional plains, Eucalypt open forest to woodlands on floodplains, and around wetlands.

Based on information provided in the SPRAT database (DEE, 2019), and guidelines (DotE, 2014b), there are no specific definitions for foraging, breeding and dispersal habitat for the koala. It is not possible to separate foraging and breeding habitat requirements with the available information. It is likely that foraging and breeding habitats share the same characteristics. Other examples of detailed koala habitat modelling, such as that undertaken by the Queensland Government to facilitate the application of the Koala State Planning Regulatory Provisions (Koala SPRP), have not differentiated between breeding or foraging requirements (DERM, 2009).

Within the Stage 1 Offset Area it was determined that Koala habitat includes all areas of remnant and regrowth eucalypt open forests to woodlands on floodplains (i.e. REs 11.3.7 and 11.3.25), eucalypt dry woodlands on inland depositional plains (i.e. REs 11.3.2, 11.3.36, 11.5.1, 11.5.3, 11.5.8c, 11.5.9, 11.9.9, 11.10.1d, 11.11.1 and 11.12.7) and the vegetation surrounding and within the lacustrine and palustrine wetlands (i.e. REs 11.3.27f and 11.5.17) (Figure 12). Consistent with the habitat mapped within the Stage 1 Impact Area, DPM Envirosciences (2019) has also determined that these remnant vegetation communities meet the definition of Critical Koala Habitat, in accordance with the *EPBC Act Referral Guidelines for the Vulnerable Koala* (DotE, 2014) (Table 8). This comprises 1,601 ha of critical habitat for the Koala.

Where suitably located in the landscape, regrowth vegetation has also been mapped as potential Koala habitat within the Stage 1 Offset Area as this vegetation would provide suitable habitat characteristics with the implementation of appropriate management measures proposed to be implemented by Pembroke in Section 4.5 (Figure 12). Approximately 1,135 ha of regrowth habitat has been identified as potential Koala habitat (Figure 12).



LEGEND	
 	Mining Lease Application Boundary
 	Stage 1 Biodiversity Offset Area
▲	Peaks
■	Dwelling
Threatened Species Records (Common Name)	
■	Koala
■	Critical Habitat for the Koala
■	Habitat for Koala - Low Quality

Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Threatened Species Habitat Mapping
Koala

Figure 12

Table 8
Koala Habitat Appraisal

Attribute*	Score*	Habitat Appraisal
Koala occurrence	+2	This attribute is rated 2 as there is evidence of one or more Koalas within the last 5 years. DPM Envirosciences (2018b) recorded the Koala within the Stage 1 Offset Area.
Vegetation structure and composition	+2	The woodland and riparian woodland habitat within the Stage 1 Offset Area provides habitat for the Koala based on the occurrence of recognised food tree of the Koala. This attribute is rated 2 as the woodland generally has two or more known Koala food tree species in the canopy.
Habitat connectivity	+2	This attribute is rated 2 as the Stage 1 Offset Area is part of a contiguous landscape $\geq 1,000$ ha.
Key existing threats	+2	There is little or no evidence of Koala mortality from vehicle strike or dog attack in the area. This attribute is rated 2 based on the lack of evidence of Koala mortality.
Recovery value	+2	Habitat is likely to be important for achieving the interim recovery objectives for the Inland habitat which are described in DotE (2013b).
Total	10	

* DotE (2013b)

4.2.7 GREATER GLIDER

The Greater Glider is largely restricted to eucalypt forests and woodlands. It is typically found in higher abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (TSSC, 2016). The distribution may be patchy even in suitable habitat. The Greater Glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (TSSC, 2016).

Within the Stage 1 Offset Area, the Greater Glider was recorded on four occasions within the Stage 1 Offset Area along drainage features and within wetland habitats (Figure 13). Recordings included direct observation and identification of scats within Eucalypt dry woodlands on inland depositional plains and Eucalypt open forest to woodlands on floodplains.

There is no habitat definition on DEEs SPRAT database (DEE, 2019) for Greater Glider. The Conservation Advice for the species suggests it is largely restricted to eucalypt forests and woodlands, preferring forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (TSSC, 2016). It feeds only on myrtaceous species and is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old, large trees (dbh >50cm) with large hollows (TSSC, 2016). Home ranges are typically relatively small (1–4 ha), but are larger in lower productivity forests and more open woodlands (up to 16 ha) (TSSC 2016). The Greater Glider is considered to be particularly sensitive to forest clearance and may be sensitive to fragmentation, having relatively low persistence in small forest fragments and poor dispersal across vegetation that is not native forest (TSSC, 2016).

Based on the information provided in the SPRAT database (DEE, 2019) and listing advice (TSSC, 2016), there are no specific definitions for foraging, breeding and dispersal habitat for the Greater Glider. However, it is likely that foraging, breeding and dispersal habitats share the same characteristics – particularly as the Greater Glider requires large hollows to shelter in during the day, limiting the distance it can travel away from habitats that provide these hollows. In a study in 2007, it was noted that den tree species included the same species used for foraging (Smith et al., 2007).

Within the Stage 1 Offset Area it was determined that Greater Glider habitat includes all areas of remnant and regrowth 'Eucalypt open forests to woodlands on floodplains' (i.e. REs 11.3.7 and 11.3.25), 'Eucalypt dry woodlands on inland depositional plains' (i.e. REs 11.3.2, 11.3.36, 11.5.1, 11.5.3, 11.5.8c, 11.5.9, 11.9.9, 11.10.1d, 11.11.1 and 11.12.7) and the vegetation surrounding and within the lacustrine and palustrine wetlands (i.e. REs 11.3.27f and 11.5.17) (Figure 10). These REs all contain tree species which provide suitable foraging habitat for the Greater Glider. This comprises 1,601 ha of potential breeding/foraging/dispersal habitat for the Greater Glider.

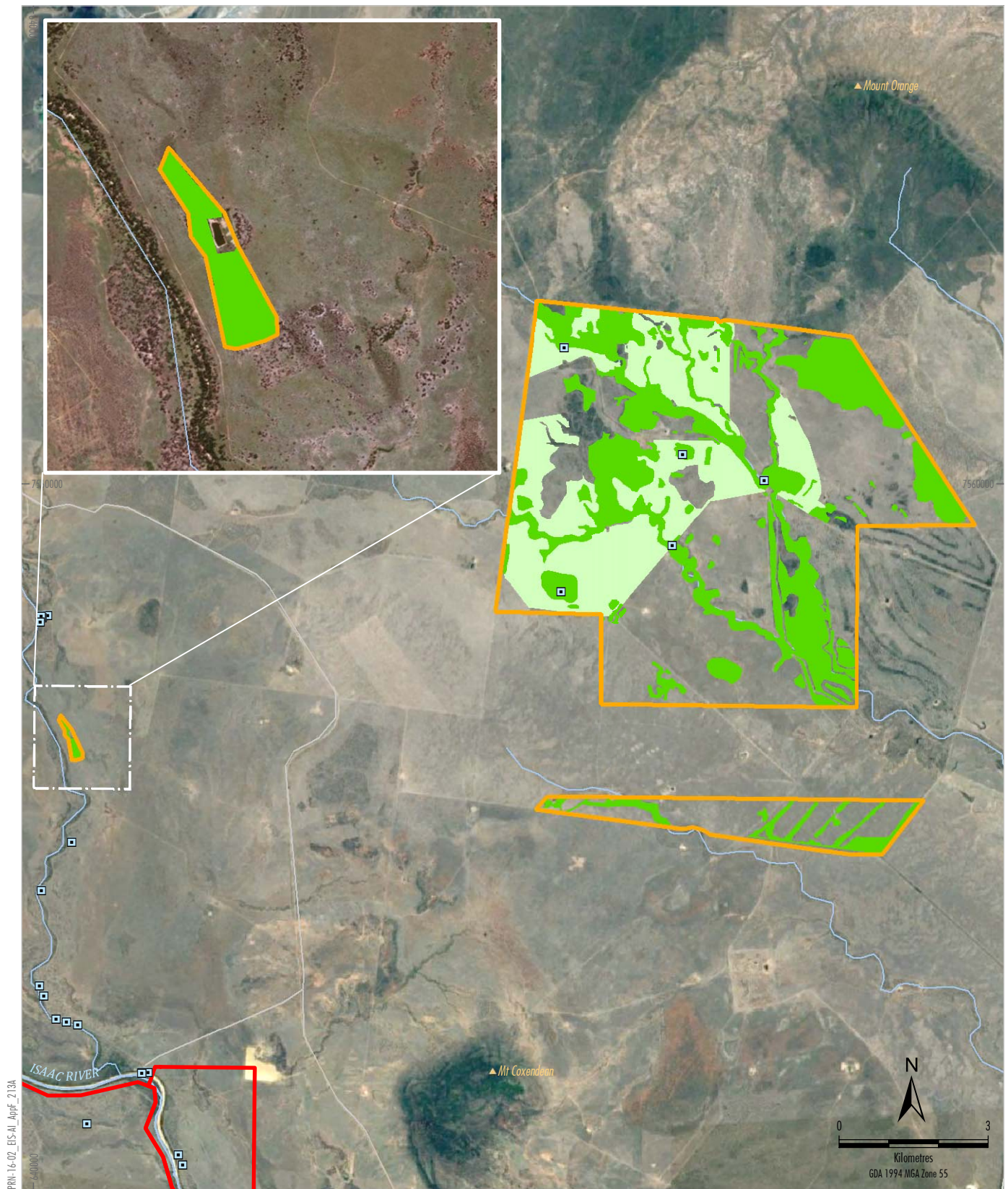
These habitat types contain Greater Glider food trees (*Eucalyptus* spp.), which are not found or not in high abundance (as suggested in the Conservation Advice) within other habitat types (that are cleared or Acacia communities) in the Project area or Stage 1 Offset Area. Denning trees (i.e. large trees containing suitable hollows) were confirmed to be present within REs 11.3.25, 11.3.2, and 11.5.3. Given the size of the Stage 1 Offset Area, it is highly likely that large trees containing suitable denning hollows were also present throughout other suitable REs. The species is known to have limited dispersal ability across vegetation that does not incorporate feeding or denning trees (TSSC, 2016).

Where suitably located in the landscape, regrowth vegetation has also been mapped as potential Greater Glider habitat within the Stage 1 Offset Area, as this vegetation would provide suitable habitat characteristics with the implementation of appropriate management measures proposed to be implemented by Pembroke in Section 4.5 (Figure 13). Approximately 1,135 ha of regrowth habitat has been identified as potential Greater Glider habitat (Figure 13).

4.3 EXISTING THREATS TO MNES WITHIN THE STAGE 1 OFFSET AREA

A number of threats to MNES fauna were confirmed to be present within the Stage 1 Offset Area during the field surveys undertaken by DPM Envirosiences. These threats are identified below and, if not managed properly, would continue to result in the degradation of the native vegetation and fauna habitats within the Stage 1 Offset Area, including habitat for MNES.

- The woodland/forest habitat is fragmented due to the maintenance of large cleared areas for cattle grazing.
- Regeneration of native vegetation is reduced by cattle feeding and trampling on native vegetation.
- Water sources (including wetlands) are subject to grazing livestock, resulting in degradation.
- Erosion was identified along watercourses due to cattle tracks.
- Weeds are present in high numbers (in particular Buffel Grass, Castor Oil Plant and Stinking Passion Flow).
- Feral animals are present through-out, including cane toads, cats, dogs, rabbits, and pigs.
- Woodland/forest habitat is divided by barbed wire fences.



Source: DPM (2018), Pembroke (2018), Queensland Department of Natural Resources, Mines and Energy (2017)
 Orthophoto: Google Image (2016)



OLIVE DOWNS COKING COAL PROJECT
Threatened Species Habitat Mapping
Greater Glider

Figure 13

4.4 EPBC ACT ASSESSMENT GUIDE

The *EPBC Act Offsets Assessment Guide* (DSEWPC, 2012b) has been used to determine the percentage of the offset liability which would be met by the Stage 1 Offset Area. The data used to inform these assessments is provided in the Terrestrial Flora Assessment (DPM Envirosciences, 2018a) and Terrestrial Fauna Assessment (DPM Envirosciences, 2018b).

The flora surveys within the Stage 1 Offset Area were undertaken in accordance with the Qld Herbarium vegetation survey methods described in Neldner *et al.* (2017). Survey techniques included a combination of secondary and quaternary surveys, ground-truthing of REs, identification of threatened ecological communities under the EPBC Act and random meanders. Terrestrial habitat quality data was also collected in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP, 2017a).

A habitat quality assessment was undertaken using the survey methodology outlined in the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP, 2017a). This included consideration of the following attributes identified in *EPBC Act Offsets Assessment Guide* (DSEWPAC, 2012b).

- site condition (i.e. collection of biocondition data during the field surveys which relate to the structure and condition of the Stage 1 Offset Area and presence of suitable habitat features); and
- site context (i.e. consideration of connectivity with other habitat features, threats within the Stage 1 Offset Area and importance of the habitat in a regional context).

The *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP, 2017a) does not include specific requirements to identify species stocking rate. However, surveys were undertaken in the Stage 1 Offset Area to evaluate the usage of the site by each relevant species. Each of the target MNES species were recorded within the Stage 1 Offset Area, with the exception of the Australian Painted Snipe which has been recorded approximately 5 km north (Figure 10). This information is used to inform the assessment of the “role of the site to the overall population” (an input into the habitat quality score).

Following this assessment, the condition data was used to justify the existing habitat quality inputs in to the *EPBC Act Offsets Assessment Guide* (DSEWPAC, 2012b). The inputs used to assess the suitability of the Stage 1 Offset Area and the justification for the values chosen is provided in Attachment 1.

Table 9 provides a reconciliation of the Stage 1 Project offset requirements against the ecological values of the Stage 1 Offset Area.

As demonstrated in Table 9, the Stage 1 Offset Area contains all matters that require offsetting as part of Stage 1 of the Project and is suitably sized to satisfy the requirements of the *EPBC Act Environmental Offsets Policy* (DSEWPC, 2012a).

Table 9
Stage 1 Offset Area Reconciliation

Relevant Matter of National Environmental Significance	Stage 1 Impact (ha)*	Area within the Stage 1 Offset Area (ha)*	Percentage of Offset Liability Satisfied ¹	Offset Requirement Satisfied ¹
Ornamental Snake	506 ²	854 ²	103.78%	Yes
Australian Painted Snipe	21 ³	86 ³	131.35%	Yes
Squatter Pigeon (southern)	823 ⁴	3,561 ⁵	113.25%	Yes
Koala	826.5 ⁶	2,736 ⁷	100.59%	Yes
Greater Glider	826.5 ⁸	2,736 ⁹	100.61%	Yes

* Approximately 90% of these areas is associated with the Mine Site and Access Road, 3% is associated with the Water Pipeline, 2% is associated with the Project ETL and 5% is associated with the Rail Spur and Loop.

¹ In accordance with the *EPBC Act Offsets Assessment Guide* (DSEWPC, 2012b).

² This is comprised entirely of 'Important Habitat' for the Ornamental Snake.

³ This is comprised entirely of potential breeding habitat for the Australian Painted Snipe.

⁴ This is comprised of 661 ha of 'breeding habitat', 140 ha of foraging habitat, and 22 ha of dispersal habitat for the Squatter Pigeon (southern).

⁵ This is comprised of 1,811 ha of 'breeding habitat', 1,452.5 ha of foraging habitat, and 297.5 ha of dispersal habitat for the Squatter Pigeon (southern).

⁶ This is comprised entirely of 'Critical Habitat' for the Koala.

⁷ This is comprised of 1,601 ha of 'Critical Habitat' and 1,135 ha of regrowth habitat for the Koala.

⁸ This is comprised entirely of potential breeding/foraging habitat for the Greater Glider.

⁹ This is comprised of 1,601 ha of potential foraging habitat and 1,135 ha of regrowth habitat for the Greater Glider.

4.5 PROPOSED MANAGEMENT MEASURES

Pembroke proposes to implement management measures within the Stage 1 Offset Area, once established to improve ecological condition and reduce threats. The management measures, performance objectives and timeframes will be detailed at a later stage in an Offset Management Plan. A brief summary of management measures is provided below, including:

- managing natural regeneration of regrowth vegetation;
- feral animal control to reduce habitat degradation (particularly by Feral Pigs);
- weed control to reduce weed cover, avoid introduction of any new weed species (reducing indirect threats that affect habitat quality) and reduces competition with native species regeneration;
- addition of species-specific Greater Glider nest boxes (to improve sheltering habitat);
- removal of barbed wire fencing;
- implementation of controlled livestock grazing regimes to encourage natural regeneration of native vegetation and prevent further degradation of habitat whilst assisting to reduce fuel load (short to medium term); and
- fuel management to avoid high intensity bushfires.

A description of each of these measures is provided below.

Regeneration and Active Seeding

The land within the Stage 1 Offset Area is considered to have moderate to high resilience despite the past disturbance, as evidenced by regrowth of native trees and understorey species. Therefore, the primary method for regenerating non-remnant areas within the Stage 1 Offset Area will be through management of threatening processes that inhibit natural regeneration (e.g. weeds, feral animals and grazing livestock).

Active seeding/planting will be a contingency measure in the event that natural regeneration is not readily occurring after at least three successive annual monitoring events. Active revegetation will be undertaken using appropriate plantings, brush mulching or seeding of local seed sources.

Feral Animal Management

The aim of feral animal management is to reduce and minimise the presence of vertebrate pest species within the Stage 1 Offset Area, including but not limited to Feral Pigs, European Rabbit and Feral Cat. Feral pigs in particular are a threat to degrading gilgai and Ornamental Snake habitat.

Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required. Monitoring of vertebrate pest animals is to be undertaken every two years by a suitably qualified practitioner using the most current best-practice methods.

Control measures will be implemented by mine staff or by an appropriate Pest Control Contractor(s) annually or as required. All personnel involved in feral animal control will be required to hold relevant and valid licences/permits, including any relevant chemical licences for pesticide use.

Control measures will consider the guidelines found on the Department of Agriculture, Fisheries and Forestry website. A selection of these techniques or additional techniques will be undertaken depending on the vertebrate pest animal species, which is in an abundance that requires control (as determined through monitoring) and the success of these control techniques. The control of vertebrate pest animals is intended to be adaptive and will be informed/reviewed based on monitoring.

The following threat abatement plans would be relevant:

- *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs (Sus scrofa)* (DEE, 2017).
- *Threat Abatement Plan for Competition and Land Degradation by Rabbits* (DEE, 2016).
- *Threat Abatement Plan for Predation by Feral Cats* (DotE, 2015).
- *Threat Abatement Plan for the Biological Effects, Including Lethal Toxic Ingestion, Caused by Cane Toads* (DSEWPC, 2015).

Attachment 3 provides a comparison between current management actions and obligations of the offset area under the *Biosecurity Act 2016* and the management actions that would be undertaken as part of proposed comprehensive management of the Stage 1 Offset Area.

Weed Management

The purpose of weed management is to reduce the presence of environmental weeds/restricted invasive plants, which will impact on the desired conservation outcomes of the Stage 1 Offset Area. The procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer.

Physical removal and chemical application are the main weed control methods available, and appropriately qualified persons will be engaged to undertake weed control within the Stage 1 Offset Area. The selected treatments employed will be documented and monitored.

Attachment 3 provides a comparison between current management actions and obligations of the offset area under the *Biosecurity Act 2016* and the management actions that would be undertaken as part of proposed comprehensive management of the Stage 1 Offset Area.

Nest Boxes

Nest boxes will be installed to provide denning habitat for the Greater Glider in the short to medium term. In addition to the above, nest boxes will also be installed to provide habitat opportunities in the short to medium term for a number of other arboreal fauna species that would occur within the Stage 1 Offset Area. Size of nest boxes will be tailored to the relevant species requirements and Pembroke would conduct ongoing monitoring of their usage.

The nest boxes will be installed under the direction of the suitably qualified expert. The location in which the nest box will be installed will take into account the following factors:

- the tree on which it is to be installed (i.e. healthy living trees without existing hollows);
- the existing tree hollow density of the surrounding area in which they will be installed (i.e. with a preference for a location with low tree hollow density);
- to provide shelter from rain and, if possible, excessive sun; and
- camouflage from potential predators.

Quarterly inspections during the first year will enable occupation timing to be documented. Following the first year, monitoring will occur annually in spring and may then be reduced to biennial monitoring following a review of the monitoring results.

Removal of Barbed Wire

Barbed wire use in fencing is a recognised threat to a range of fauna (e.g. bats and gliders) and is particularly hazardous when used in new fences and across fauna movement paths.

Barbed wire fencing within the Stage 1 Offset Area will be removed upon control of grazing. Where practical, the top two wire strands will be replaced with plain wire. Visual inspections of the fencing will be undertaken and any breaches rectified. If livestock from outside the Stage 1 Offset Area are found to be eluding the fence, the design of the fence will be modified as required.

Grazing Control

Extended periods of intense grazing of livestock can suppress native plant species which can hinder the performance of regeneration. Long-term intense grazing of livestock is a recognised threat to the Brigalow (*Acacia harpophylla* dominant and co-dominant) community.

Rotational livestock grazing will be used as a method of managing Buffel Grass and reducing fuel loads in the Stage 1 Offset Area. Rotational grazing is where a period of grazing is followed by an extended period of rest which, depending on pasture growth and seasonal conditions, may be up to a few months. Rotational livestock will provide periods throughout the year when there will be no grazing pressure in selected areas.

Stocking rates in the Stage 1 Offset Area will be highly dependent upon seasonal conditions and will fluctuate from year to year, so a precise set stocking rate cannot be established. Publicly available literature indicates that set stocking rates may not be the best tool for managing grazing pressure, due to the variability in seasonal conditions. During years with above average rainfall in the Stage 1 Offset Area, higher stocking rates will be required for Buffel Grass and fire fuel load management. Conversely, lower stocking rates will be utilised during years with below average rainfall when Buffel pasture growth has been limited (e.g. grazing a sustainable/safe level of pasture utilisation).

If grazing is excluded from an individual paddock, monitoring would still continue to assess whether there is a need for management of fuel loads either through re-introduction of short-term grazing or controlled burns.

Bushfire Management

Fire can adversely affect some vegetation communities and destroy habitat components such as coarse woody debris. Hot crown fires can also lead to mortality of arboreal mammals. However, fire can also provide important ecosystem benefits, such as reducing Buffel grass biomass (in some instances) and assisting natural regeneration. Therefore, the optimal fire regime designed to prevent hot damaging bushfires, but also to promote regeneration and germination for the native vegetation communities and habitats within the Stage 1 Offset Area, will be designed and implemented.

Bushfire preventative measures will include:

- Educating employees and contractors on general fire awareness and response procedures.
- Creation and maintenance of fire tracks (fire breaks) for fire control.
- Fire will be excluded from Brigalow communities and non-remnant areas with regenerating saplings. Ground fuel loads will be controlled through the strategic rotational grazing of cattle to prevent thick grass biomass from accumulating over time. Reducing the fuel load will minimise the impact of uncontrolled fires (e.g. from lightning strike).
- When necessary, fuel management (e.g. hazard reduction burns prior to the dry season) will be undertaken in consultation with the Qld Rural Fire Service.
- Local fire wardens will be consulted and fire permits will be obtained prior to hazard reduction burns.
- Controlled burning at appropriate intervals to promote regeneration and germination of native vegetation communities and species.

4.5.1 SCHEDULE OF CONSERVATION COMMITMENTS

Table 10 provides a schedule of conservation commitments which would be implemented by Pembroke within the Stage 1 Offset Area.

Table 10
Stage 1 Offset Area Management Schedule

Action	How the Activity will be Undertaken	Timing	Responsibility
Preparation of Stage 1 Offset Area Management Plan	Detailed offset management plan will be prepared and submitted to DEE for approval.	1 year from Project commencement	Pembroke
Legal Protection of Stage 1 Offset Area	Protection of Stage 1 Offset Area via gazettal as a protected area (e.g. a nature refuge) under the NC Act.	2 years from Project commencement	Pembroke
Management of Feral Animals	As required, depending on pest animal, in consideration with animal ethics.	Annual	Pembroke / Appropriately Qualified Person(s)

Table 10 (Continued)
Stage 1 Offset Area Management Schedule

Action	How the Activity will be Undertaken	Timing	Responsibility
Management of Environmental Weeds / Restricted Invasive Plants	Physical removal, chemical application.	Annual, spring to early summer	Pembroke / Appropriately Qualified Person(s)
Installation of Nest Boxes	As required, depending on advice from the suitably qualified expert.	During initial set-up of the offset areas	Pembroke / Appropriately Qualified Person(s)
Removal of Barbed Wire	Physical removal of barbed wire.	Upon control of grazing	Pembroke
Management of Livestock	Controlled grazing through the installation of fencing and locked gates.	Ongoing	Pembroke
Bushfire Management	Preventative measures (e.g. fire track maintenance, controlled grazing to reduce ground fuel loads).	Ongoing	Pembroke
Annual Monitoring Reports	Suitably qualified ecologist/s will be engaged to undertake ecological monitoring of the Stage 1 Offset Area and evaluate effectiveness of management actions. Results of monitoring will be summarised in an annual report.	Annual	Pembroke

4.6 LONG-TERM SECURITY

Pembroke proposes to legally secure the Stage 1 Offset Area via gazettal as a protected area (e.g. a nature refuge) under the NC Act, as requested by the Department of Natural Resources, Mines and Energy (DNRME) and the Department of Environment and Science (DES) during consultation regarding the Project.

Pembroke would seek to secure the Stage 1 Offset Area within two years of Project commencement to allow sufficient time for the nature refuge gazettal to take place.

4.7 RECONCILIATION OF THE STAGE 1 OFFSET AREA AGAINST EPBC ACT ENVIRONMENTAL OFFSETS POLICY

A reconciliation of the Stage 1 Offset Area against the EPBC Act Environmental Offsets Policy (DSEWPC, 2012a) is provided in Table 11.

Table 11
Reconciliation of the Proposed Offset Strategy against EPBC Act Environmental Offsets Policy

Offset Principles*	Elements of the Project Offset that Address these Requirements
<i>Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the action.</i>	The Stage 1 Offset Area has been specifically tailored to the protected matters relevant to Stage 1 of the Project (i.e. Ornamental Snake, Australian Painted Snipe, Squatter Pigeon [southern], Koala and Greater Glider) and would deliver an overall conservation outcome that improves or maintains the viability of each protected matter.
<i>Be built around direct offsets but may include other compensatory measures.</i>	100% of the Commonwealth offset requirements for Stage 1 of the Project would be satisfied through direct offsets.
<i>Be in proportion to the level of statutory protection that applies to protected matter.</i>	The Stage 1 Offset Area would provide for greater than 100% of the offset liability for each protected matter relevant to Stage 1 of the Project. This has been determined by applying the <i>EPBC Act Offsets Assessment Guide</i> (DSEWPC 2012b). The Stage 1 Offset Area will be legally secured in perpetuity.
<i>Be of a size and scale proportionate to the impacts on the protected matter.</i>	It is determined that the Stage 1 Offset Area would be of a suitable size and scale proportionate to the impacts of each protected matter. The inputs and outputs of the <i>EPBC Act Offsets Assessment Guide</i> (DSEWPC 2012b) is provided in Attachment 1.
<i>Effectively account for and manage the risks of the offset not succeeding.</i>	<p>The <i>EPBC Act Offsets Assessment Guide</i> (DSEWPC 2012b), which has been applied to Stage 1 of the Project accounts for the risk of the offset not succeeding (Attachment 1).</p> <p>In addition, measures to manage the Stage 1 Offset Area would provide for ongoing adaptive management in the unlikely event that the offset is not succeeding. Performance objectives and corrective actions will be documented in the Stage 1 Offset Management Plan and risks to the biodiversity values within the Stage 1 Offset Area will be assessed and appropriate management and mitigation measures applied.</p>
<i>Be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs.</i>	The Stage 1 Offset Area would provide additional conservation outcomes through additional management actions that will enhance ecological condition and habitat values, reduce risks and will be legally secured in perpetuity. The offset land is currently freehold and can be grazed as well as non-remnant areas ploughed or developed for agricultural purposes. This would result in the loss or decline of protected matters including regrowth brigalow and threatened fauna habitats. The offset will ensure conservation gains are achieved. The enduring protection that would be applied to the Stage 1 Offset Area would be new and additional under duty of care or any environmental planning laws.
<i>Be efficient, effective, transparent, proportionate, scientifically robust and reasonable.</i>	<p>The Stage 1 Offset Area would efficiently and effectively compensate for the impacts on the protected matters and help maintain the viability of the protected matters. Management actions proposed are known to be effective in improving ecological condition such as weed management.</p> <p>Flora and fauna surveys of the Stage 1 Offset Area have been undertaken to determine:</p> <ul style="list-style-type: none"> • the area of the offset in comparison to the area of impact; • the nationally threatened fauna species present (or predicted to occur) and their conservation status; and • the connectivity and condition of the native vegetation / fauna habitat; and • management actions.
<i>Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.</i>	The Stage 1 Offset Management Plan will clearly outline the areas of MNES, starting habitat quality, performance objectives to be achieved over prescribed timeframes, monitoring program and corrective actions where those outcomes are not being achieved. Annual monitoring and reporting are proposed to ensure that management actions are being implemented and offset outcomes are being achieved.

Source: DPM Envirosciences (2018a)

* EPBC Act Environmental Offsets Policy (DSEWPC, 2012a).

5 MANAGEMENT OF LAND FOR POTENTIAL USE AS OFFSET FOR STAGES 2, 3 AND 4

Pembroke also proposes to manage portions of the Iffley, Deverill and Twenty Mile properties outside the Stage 1 Offset Area. Management measures may include (but not be limited to):

- revegetation activities to increase the proportion of native vegetation;
- management of livestock grazing;
- feral animal control in accordance with the *Biosecurity Act, 2014* (particularly cats, foxes and feral pigs); and
- management of weeds in accordance with the *Biosecurity Act, 2014*.

The available area of land for potential use as biodiversity offsets for the MNES would be specified prior to the commencement of works for each stage. Of the lands currently available to Pembroke (and excluding the Stage 1 Offset proposal), some 10,000 ha of potential habitat for fauna species listed under the EPBC Act would be available for future offsets.

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ATTACHMENT 1

EPBC ACT OFFSET ASSESSMENT GUIDE INPUT JUSTIFICATION

Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for Australian painted snipe *Rostratula australis* (Endangered)

The Olive Downs Project (Stage One) proposes to clear 21 ha of potential breeding habitat for Australian painted snipe within the Stage 1 Impact Area. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on Australian painted snipe, there will be a residual impact that cannot be avoided and will be offset by the proponent.

Terrestrial habitat quality assessments were conducted within the Stage 1 Impact Area and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

Stage 1 Impact Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Australian Painted Snipe habitat indicates an average score of seven (7). There were 4 sites assessed including two in RE 11.3.27 and two in 11.5.17. The total area of potential remnant habitat within the Stage 1 Impact Area is 21 ha.

Stage 1 Offset Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Australian Painted Snipe habitat indicates an average score of six (6). There were 4 sites assessed including one in RE 11.3.27, three in RE 11.5.17. The total area of potential remnant habitat within the Stage 1 Offset Area is 86 ha. The complete terrestrial habitat quality assessments are shown in Attachment 4.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for Australian painted snipe potential breeding habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 86 ha of remnant habitat within the proposed offset area.
- **Start quality** – As outlined above, the remnant habitat within the proposed offset has a quality score of 6.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For Australian painted snipe, the habitat quality score of remnant habitat is estimated to increase to 8 (from 6) within 20 years due to the implementation of management measures outlined below for remnant vegetation. Attachment 2 provides further justification for how the proposed management measures would result in an increase in habitat quality for the species within the Stage 1 Offset Area.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 20 years for the habitat quality of the remnant habitat to improve 2 points given the implementation of the management measures outlined below.

- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the Australian painted snipe habitat without the offset. Threatening processes for Australian painted snipe, consistent with those described in the species' SPRAT profile, which are currently present within the Stage 1 Offset Area include:
 - water sources (including wetlands) are subject to grazing livestock, resulting in degradation to the natural system;
 - presence of high fuel load (artificially increased by introduction of buffel grass for grazing pasture);
 - degradation of habitat by feral animals (e.g. pigs and cattle);
 - presence of invasive weeds within the wetland habitats; and
 - predation by feral species (particularly cats and foxes).

Without the offset, the future habitat quality score of remnant habitat is estimated to be 5 within 20 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

The level of confidence in the result for the Australian painted snipe habitat is considered to be 95% given the start quality (6) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 20 years with management measures to improve foraging and sheltering quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

- conservation of habitat areas with offset agreement and covenant on title to ensure long-term protection of wetland areas
- management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition
- control of grazing pressure to prevent further degradation of habitat within 5 years of the offset area being secured
- fuel reduction and management and implementation of fire breaks
- feral animal management (particularly pigs, cats and foxes) by an appropriately qualified person

- procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

Offsets Assessment Guide	
For use in determining offsets under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>	
2 October 2012	
This guide relies on Macros being enabled in your browser.	

Matter of National Environmental Significance	
Name	Australian painted snipe
EPBC Act status	Endangered
Annual probability of extinction <small>Based on IUCN category definitions</small>	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Australian Painted Snipe	Area	21	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	7	Scale 0-10	
				Total quantum of impact	14.70	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0									
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	14.70	Adjusted hectares	86	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	86	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	19.31	131.35%	Yes		
										Future area without offset (adjusted hectares)	86.0	Future area with offset (adjusted hectares)	86.0									
						Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	8	3.00	95%	2.85	2.25					
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
Mortality rate e.g. Change in number of road kills per year	No																					
Number of individuals e.g. Individual plants/animals	No																					

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	14.7	19.31	131.35%	Yes	\$0.00	N/A
	Area of community	0				\$0.00	\$0.00
						\$0.00	\$0.00

Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for greater glider *Petauroides volans* (Vulnerable)

The Olive Downs Project (Stage One) proposes to clear 826.5 ha of potential breeding and foraging habitat for greater glider. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on greater glider, there will be a residual impact that cannot be avoided and will be offset by the proponent.

Terrestrial habitat quality assessments were conducted within the Stage 1 Impact Area and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

Stage 1 Impact Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Greater Glider habitat indicates an average score of seven (7). There were 10 sites assessed including two in RE 11.3.2, two in RE 11.3.25, four in 11.5.3 and two in 11.5.9. The total area of potential remnant habitat within the Stage 1 Impact Area is 826.5 ha.

Stage 1 Offset Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Greater Glider habitat indicates an average score of seven (7). There were 9 sites assessed including three in RE 11.5.17, one in RE 11.3.27, three in RE 11.3.25 and two in RE 11.3.2. The total area of potential remnant habitat within the Stage 1 Offset Area is 1,601 ha. The areas of non-remnant vegetation which do not yet provide habitat for the Koala have been assumed to have a current habitat quality score of 0. The total area of potential regrowth habitat within the Stage 1 Offset Area is 1,135 ha. The complete terrestrial habitat quality assessments are shown in Attachment 4.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for greater glider potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

1. **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
2. **Start area (hectares)** – there is approximately 1601 ha of remnant habitat within the proposed offset and approximately 1135 ha of regrowth habitat.
3. **Start quality** – As outlined above, the remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 0.
4. **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For greater glider, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 20 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to increase to 5 within 20 years due to the implementation of management measures outlined below for regrowth vegetation. Attachment 2 provides further justification for how the proposed management measures would result in an increase in habitat quality for the species within the Stage 1 Offset Area.

5. **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 20 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 20 years for the habitat quality of the regrowth habitat to improve 5 points given the implementation of the management measures outlined below.
6. **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
7. **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the greater glider habitat without the offset. Threatening processes for the Greater Glider, consistent with those described in the species' SPRAT profile, which are currently present within the Stage 1 Offset Area include:
 - fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not necessarily connected)
 - regeneration of native vegetation is reduced by cattle feeding and trampling on native vegetation
 - presence of high fuel load (artificially increased by introduction of buffel grass for grazing pasture)
 - predation from feral animals (particularly cats, dogs and foxes);
 - use of barbed wire for fencing

Without the offset, the future habitat quality score of both the remnant and regrowth habitat is not estimated to change from the current scores of 7 and 0 within 20 years.

8. **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

The level of confidence in the result for the remnant habitat is considered to be 95% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 20 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

- conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection
- control of grazing pressure to prevent further degradation of habitat within 5 years of the offset area being secured
- fuel reduction and management and implementation of fire breaks
- feral animal management (particularly cats, dogs and foxes) by an appropriately qualified person

- removal of barbed wire fencing
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

The level of confidence in the result for the regrowth habitat is considered to be 80% given a higher level of management would be required to improve the quality of regrowth to the future desired quality (5). To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging and quality of shelter, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for greater glider in the regrowth habitat. Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

- strategic protection of regrowth to improve connectivity between remnant patches of habitat
- management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition
- feral animal control to reduce predator pressures by an appropriately qualified person (particularly from dogs)
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required
- addition of species-specific greater glider nest boxes (to improve sheltering habitat)

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser

Matter of National Environmental Significance	
Name	Greater Glider
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Greater Glider	Area	827	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	7	Scale 0-10	
				Total quantum of impact	578.90	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No						

[illegible]

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	578.9	436.22	75.35%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Greater Glider
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Greater Glider	Area	826.5	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	7	Scale 0-10	
				Total quantum of impact	578.55	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
						Future area without offset (adjusted hectares)	0.0		Future area with offset (adjusted hectares)	0.0											
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	578.55	Adjusted hectares	1601	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1601	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%								
						Future area without offset (adjusted hectares)	1601.0		Future area with offset (adjusted hectares)	1601.0	0.00	95%	0.00	0.00							
						Time until ecological benefit	20	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	1.00	95%	0.95	0.91				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
	Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																				

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	578.55	146.14	25.26%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for koala *Phascolarctos cinereus* (Vulnerable)

The Olive Downs Project (Stage One) proposes to clear 826.5 ha of potential breeding and foraging habitat for koala within the Stage 1 Impact Area. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on koala, there will be a residual impact that cannot be avoided and will be offset by the proponent.

Terrestrial habitat quality assessments were conducted within the Stage 1 Impact Area and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

Stage 1 Impact Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Koala habitat indicates an average score of seven (7). There were 10 sites assessed including two in RE 11.3.2, two in RE 11.3.25, four in 11.5.3 and two in 11.5.9. The total area of potential remnant habitat within the Stage 1 Impact Area is 826.5 ha.

Stage 1 Offset Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Koala habitat indicates an average score of seven (7). There were 9 sites assessed including three in RE 11.5.17, one in RE 11.3.27, three in RE 11.3.25 and two in RE 11.3.2. The total area of potential remnant habitat within the Stage 1 Offset Area is 1,601 ha. The areas of non-remnant vegetation which do not yet provide habitat for the Koala have been assumed to have a current habitat quality score of 0. The total area of potential regrowth habitat within the Stage 1 Offset Area is 1,135 ha. The complete terrestrial habitat quality assessments are shown in Attachment 4.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for koala potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 1,601 ha of remnant habitat within the proposed offset and approximately 1,135 ha of regrowth habitat.
- **Start quality** – As outlined above, the remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 0.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For koala, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 20 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to be 5 within 20 years due to the implementation of management measures outlined below for regrowth vegetation. Attachment 2 provides further justification

for how the proposed management measures would result in an increase in habitat quality for the species within the Stage 1 Offset Area.

- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 20 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 20 years for the habitat quality of the regrowth habitat to improve 5 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the koala habitat without the offset. Threatening processes for Koala, consistent with those described in the species' SPRAT profile, which are currently present within the Stage 1 Offset Area include:
 - fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not necessarily connected)
 - regeneration of native vegetation is reduced by cattle feeding and trampling on native vegetation
 - predation from feral animals (particularly cats, dogs and foxes)
 - presence of high fuel load (artificially increased by introduction of buffel grass for grazing pasture)

Without the offset, the future habitat quality score of both the remnant and regrowth habitat is not estimated to change from the current scores of 7 and 0 within 20 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

The level of confidence in the result for the remnant habitat is considered to be 95% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 20 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

- conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection
- control of grazing pressure to prevent further degradation of habitat within 5 years of the offset area being secured
- fuel reduction and management and implementation of fire breaks
- feral animal management (particularly cats, dogs and foxes) by an appropriately qualified person

- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

The level of confidence in the result for the regrowth habitat is considered to be 80% given a higher level of management would be required to improve the quality of regrowth to the future desired quality (5). To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for koala in the regrowth habitat. Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

- strategic protection of regrowth to improve connectivity between remnant patches of habitat
- management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition
- feral animal control to reduce predator pressures by an appropriately qualified person (particularly from dogs)
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Koala	Area	827	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	7	Scale 0-10	
				Total quantum of impact	578.90	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
								Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	578.90	Adjusted hectares	1135	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1135	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%								
								Future area without offset (adjusted hectares)	1135.0	Future area with offset (adjusted hectares)	1135.0	0.00	80%	0.00	0.00						
						Time until ecological benefit	20	Start quality (scale of 0-10)	0	Future quality without offset (scale of 0-10)	0	Future quality with offset (scale of 0-10)	5	5.00	80%	4.00	3.84				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
Mortality rate e.g. Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	578.9	436.22	75.35%	No	\$0.00	#DIV/0!
	Area of community	0				\$0.00	\$0.00
						\$0.00	#DIV/0!

Offsets Assessment Guide
For use in determining offsets under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> 2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Koala	Area	827	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	7	Scale 0-10	
				Total quantum of impact	578.90	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset										
						Future area without offset (adjusted hectares)	0.0		Future area with offset (adjusted hectares)	0.0												
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	578.90	Adjusted hectares	1601	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1601	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	146.14	25.24%	No		
						Future area without offset (adjusted hectares)	1601.0		Future area with offset (adjusted hectares)	1601.0												
						Time until ecological benefit	20	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8									
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
	Mortality rate e.g. Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																					

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	578.9	146.14	25.24%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

Justification of values entered into the Offset Assessment Guide for breeding and foraging habitat for ornamental snake *Denisonia maculata* (Vulnerable)

The Olive Downs Project (Stage One) proposes to clear 506 ha of potential breeding and foraging habitat for ornamental snake within the Stage 1 Impact Area. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on ornamental snake, there will be a residual impact that cannot be avoided and will be offset by the proponent.

Terrestrial habitat quality assessments were conducted within the Stage 1 Impact Area and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

Stage 1 Impact Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Ornamental Snake habitat indicates an average score of five (5). There were 10 sites assessed including two in RE 11.3.1, three in RE 11.4.9 and five in gilgai habitat. The total area of potential remnant habitat within the Stage 1 Impact Area is 506 ha.

Stage 1 Offset Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential Ornamental Snake habitat indicates an average score of five (5). There were 5 sites assessed including two in RE 11.4.9 three in gilgai habitat. The total area of potential remnant habitat within the Stage 1 Offset Area is 854 ha. The complete terrestrial habitat quality assessments are shown in Attachment 4.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for ornamental snake potential breeding and foraging habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 854 ha of gilgai habitat within the proposed offset area.
- **Start quality** – As outlined above, the gilgai habitat within the proposed offset area has a quality score of 5.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For ornamental snake, the habitat quality score of gilgai habitat is estimated to increase to 7 (from 5) within 20 years due to the implementation of management measures outlined below. Attachment 2 provides further justification for how the proposed management measures would result in an increase in habitat quality for the species within the Stage 1 Offset Area.
- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 20 years for the habitat quality of the gilgai habitat to improve 2 points given the implementation of the management measures outlined below.

- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the ornamental snake habitat without the offset. Threatening processes for Ornamental Snake, consistent with those described in the species' SPRAT profile, which are currently present within the Stage 1 Offset Area include:
 - fragmentation of existing habitat (which exists in the local area as small patches that are not necessarily connected)
 - regeneration of native vegetation is reduced by cattle feeding and trampling on native vegetation.
 - degradation of habitat by feral pigs
 - fatality from ingestion of poisonous cane toads
 - presence of high fuel load (artificially increased by introduction of buffel grass for grazing pasture);
 - predation from feral animals (particularly cats and foxes)
 - presence of invasive weeds within the known important habitat

Without the offset, the future habitat quality score of gilgai habitat is estimated to be 3 within 20 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

The level of confidence in the result for the Ornamental Snake is considered to be 80% given the start quality (5) is close to the future desired quality (7) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 20 years with management measures to improve shelter quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to gilgai areas:

- conservation of gilgai areas with offset agreement and covenant on title to ensure long-term protection
- management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition
- control of grazing pressure to prevent further degradation of habitat
- feral animal control by an appropriately qualified person to reduce predator pressures (particularly from cats and foxes) and habitat degradation (particularly by feral pigs)

- procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer
- fuel reduction and management and implementation of fire breaks
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Ornamental snake
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Ornamental snake	Area	506	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	5	Scale 0-10	
				Total quantum of impact	253.00	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0								
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)									
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	253.00	Adjusted hectares	854	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	854	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	80%	0.00	0.00	262.58	103.78%	Yes	
										Future area without offset (adjusted hectares)	854.0	Future area with offset (adjusted hectares)	854.0								
						Time until ecological benefit	20	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	3	Future quality with offset (scale of 0-10)	7	4.00	80%	3.20	3.07				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
Threatened species																					
Birth rate e.g. Change in nest success	No																				
Mortality rate e.g. Change in number of road kills per year	No																				
Number of individuals e.g. Individual plants/animals	No																				

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	253	262.58	103.78%	Yes	\$0.00	N/A
	Area of community	0				\$0.00	\$0.00
						\$0.00	\$0.00

Justification of values entered into the Offset Assessment Guide for breeding, foraging and dispersal habitat for squatter pigeon *Geophaps scripta* (Vulnerable)

Pembroke proposes to clear 823 ha of potential breeding, foraging and dispersal habitat for squatter pigeon within the Stage 1 Impact Area. The location of the modelled potential habitat in the Project area coincides with the location of a mineral resource suitable for mining and the proponent has taken out a mining lease over the area. Whilst careful location of mining infrastructure has resulted in a slight reduction in the impact of the proposed mining footprint on squatter pigeon, there will be a residual impact that cannot be avoided and will be offset by the proponent.

Terrestrial habitat quality assessments were conducted within the Stage 1 Impact Area and in the Stage 1 Offset Area in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP 2017b). The field survey methodologies are further described in detail in the Terrestrial Flora Assessment (DPM Envirosciences 2018a).

Stage 1 Impact Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential squatter pigeon habitat indicates an average score of eight (8). There were 10 sites assessed including two in RE 11.3.2, two in RE 11.3.25, four in 11.5.3 and two in 11.5.9. The total area of potential remnant habitat within the Stage 1 Impact Area is 823 ha.

Stage 1 Offset Area Habitat Quality Calculations

Terrestrial habitat quality assessments for the remnant vegetation providing potential squatter pigeon habitat indicates an average score of seven (7). There were 9 sites assessed including three in RE 11.5.17, one in RE 11.3.27, three in RE 11.3.25, two in 11.3.2. The total area of potential remnant habitat within the Stage 1 Offset Area is 1,601 ha. Terrestrial habitat quality assessments for the non-remnant vegetation providing potential squatter pigeon habitat indicates an average score of six (6). There were 7 sites assessed in regrowth vegetation. The total area of potential regrowth habitat is 1,960 ha. The complete terrestrial habitat quality assessments are shown in Attachment 4.

The offset calculator has been used to assess the suitability of the proposed offset area as an offset for squatter pigeon potential breeding, foraging and dispersal habitat. The offset calculator also requires the provision of crucial data to assess whether a proposed area (and management) is a suitable offset for a given impact. The variables that have been put into the offset calculator are described as follows:

- **Time over which loss is averted (max. 20 years)** – this is equivalent to the time the risk to the offset area is actively managed. A time span of 20 years was applied in this case, because this represents the maximum time taken for the areas of regrowth potential habitat to recover to remnant status. It is the length of time the proponent anticipates actively managing the offset property to achieve offset and conservation targets.
- **Start area (hectares)** – there is approximately 1,601 ha of remnant habitat within the proposed offset and approximately 1,960 ha of regrowth habitat.
- **Start quality** – As outlined above, the remnant habitat within the proposed offset has a quality score of 7 and regrowth habitat has a quality score of 6.
- **Future quality with offset** – this is the habitat quality score desired for the offset within the time until ecological benefit. For squatter pigeon, the habitat quality score of remnant habitat is estimated to increase to 8 (from 7) within 20 years due to the implementation of management measures outlined below for remnant vegetation. The habitat quality score of regrowth habitat is estimated to be 7 within 20 years due to the implementation of management measures outlined below for regrowth vegetation. Attachment 2 provides further

justification for how the proposed management measures would result in an increase in habitat quality for the species within the Stage 1 Offset Area.

- **Time until ecological benefit** – this is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. It is estimated that it will take 20 years for the habitat quality of the remnant habitat to improve 1 point given the implementation of the management measures outlined below. It is estimated that it will take 20 years for the habitat quality of the regrowth habitat to improve 2 points given the implementation of the management measures outlined below.
- **Risk of loss (%) with/without offset** – risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). The risk of loss with offset is the perceived risk of losing the protected matter on site, despite the offset going ahead. The risk of loss without offset is the perceived risk of losing the protected matter on site in a business as usual scenario. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with recent advice from DEE, the risk of loss with/without offset has been set at 0%.
- **Future quality without offset** – a habitat quality score was allocated considering the start quality of the habitat and the current threatening processes that would continue to impact the squatter pigeon habitat without the offset. Threatening processes for the squatter pigeon, consistent with those described in the species' SPRAT profile, which are currently present within the Stage 1 Offset Area include:
 - fragmentation of existing habitat (which exists in the local area as small patches of remnant and riparian corridors that are not well connected)
 - regeneration of native vegetation is reduced by cattle feeding and trampling on native vegetation
 - water sources (including wetlands) are subject to grazing livestock, resulting in degradation to the natural system
 - degradation of habitat by grazing herbivores
 - Weeds are present in high numbers (in particular Buffel Grass, Castor Oil Plant and Stinking Passion Flower); and
 - predation from feral animals (particularly cats, dogs and foxes)

Without the offset, the future habitat quality score of remnant habitat is estimated to be 6 within 20 years. Without the offset, the future habitat quality score of regrowth habitat is estimated to be 4 within 20 years.

- **Confidence in result (%)** – describes the level of certainty about the success of the proposed offset or the confidence in the proposed change in quality of the offset area. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss (threats).

The level of confidence in the result for the remnant habitat is considered to be 95% given the start quality (7) is close to the future desired quality (8) and there is a high level of confidence that an improvement in condition can be made within a reasonable timeframe that is proportionate to the time over which loss is averted. It is likely that this increase in habitat quality can be achieved within 20 years with management measures to improve foraging quality and reduce threatening processes (which were indicated as having a lower score in the terrestrial habitat quality assessments for the species). The following measures will be implemented to reduce threatening processes relevant to remnant areas:

- conservation of remnant areas with offset agreement and covenant on title to ensure long-term protection
- control of grazing pressure to prevent further degradation of habitat
- procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer
- feral animal management (particularly cats, dogs and foxes) by an appropriately qualified person
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

The level of confidence in the result for the regrowth habitat is considered to be 85% given a higher level of management would be required to improve the quality of regrowth (6) to the future desired quality (7) – an increase of 1 point. To improve the start quality of the regrowth, improvements must be made on site condition – in particular quality of foraging, threats and connectivity. These elements were indicated as requiring improvement in the terrestrial habitat quality assessments for squatter pigeon in the regrowth habitat.

Management actions that would improve the quality of the regrowth and contribute to habitat for the species are:

- conservation of habitat areas with offset agreement and covenant on title to ensure long-term protection of habitat areas
- management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition
- control of grazing pressure to encourage natural regeneration of native grasses (increasing quality of foraging habitat)
- procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer
- feral animal management (particularly cats, dogs and foxes) by an appropriately qualified person
- implementation of species monitoring to confirm the success of the management actions and allow Pembroke to adjust the actions if required

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Squatter pigeon
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Squatter pigeon	Area	823	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosiences 2018b)
				Quality	8	Scale 0-10	
				Total quantum of impact	658.40	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0								
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)									
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	658.40	Adjusted hectares	1960	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1530	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	85%	0.00	0.00	374.87	56.94%	No	
										Future area without offset (adjusted hectares)	1530.0	Future area with offset (adjusted hectares)	1530.0								
						Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	7	3.00	85%	2.55	2.45				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
	Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																				

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	658.4	374.87	56.94%	No	\$0.00	#DIV/0!
	Area of community	0				\$0.00	\$0.00
						\$0.00	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Squatter pigeon
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes	Squatter pigeon	Area	823	Hectares	Olive Downs Project - Fauna Technical Report (DPM Envirosciences 2018b)
				Quality	8	Scale 0-10	
				Total quantum of impact	658.40	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No						

[illegible]

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	658.4	370.77	56.31%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

ATTACHMENT 2

JUSTIFICATION FOR THE PROPOSED MANAGEMENT MEASURES AND SUBSEQUENT INCREASE IN HABITAT QUALITY SCORE

Table 2-1
Justification for the Proposed Management Measures and Subsequent Increase in Habitat Quality Score

Recognised Management Actions as per the DEE SPRAT Profile	Pembroke Proposed Management Actions	Specific Habitat Requirements of the MNES being Affected by the Proposed Management Actions	Change in Habitat Quality Score
Ornamental Snake			
<i>Avoid habitat fragmentation and loss through clearing (roads, ploughing, railways, mining-related activities, pipeline constructions)</i>	No vegetation in or adjacent patches of suitable habitat would be cleared, unless required for management purposes (e.g. fire breaks).	All Ornamental Snake habitat components would benefit.	The management action would result in an increase in context and connectedness of suitable habitat, quality and availability of foraging and shelter habitat and increase in habitat quality score.
<i>Reduce habitat degradation by overgrazing by stock, especially cattle, or grazing of gilgais during the wet season leads to soil compaction and compromising of soil structure</i>	Rotational grazing of cattle will be implemented within the offset area.	Improve the quality of the understory habitat for the Ornamental Snake.	The management action would result in an increase in quality and availability of foraging and shelter habitat, reduction in the threats, and increase in habitat quality score.
<i>Control of invasive weeds.</i>	The procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer. The spread and introduction of environmental weeds/restricted invasive plants to and within the offset areas will be minimised by restricting vehicles to designated access tracks.	Improve the quality of the understory habitat for the Ornamental Snake.	The management action would result in a decrease in non-native plant cover, an increase in quality of foraging and shelter habitat, reduction in the threats, and increase in habitat quality score.
<i>Control introduced pests such as pigs to manage threats at known sites.</i>	Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required.	Improve the quality of the understory habitat for the Ornamental Snake.	The management action would result in a reduction in the threats, and increase in habitat quality score.
<i>Develop and implement a management plan for the control of Cane Toads in the region.</i>			
<i>Negotiate management agreements and voluntary conservation agreements with landholders, on whose land the Ornamental Snake occurs, in line with the recommended management guidelines.</i>	The species' habitat in the proposed offset area would be secured as a Nature Reserve.	All Ornamental Snake habitat components would benefit.	The management measures that accompany the Nature Reserve would result in an improvement of the habitat quality score.
<i>Implement recommended fire management guidelines in property and reserve designs.</i>	Creation and maintenance of fire tracks (fire breaks) for fire control will be undertaken.	All Ornamental Snake habitat components would benefit.	The management action would result in an increase in quality of foraging and shelter habitat and increase in habitat quality score.
<i>Monitor and evaluate recovery actions applying an adaptive management approach.</i>	MNES fauna relevant to the offset area will be monitored over time to assess the success of the management actions being implemented.	All Ornamental Snake habitat components would benefit.	Monitoring would confirm the success of the management actions and allow Pembroke to adjust the actions if required, making sure that habitat quality scores would continue to increase.

Table 2-1 (Continued)
Justification for the Proposed Management Measures and Subsequent Increase in Habitat Quality Score

Recognised Management Actions as per the DEE SPRAT Profile	Pembroke Proposed Management Actions	Specific Habitat Requirements of the MNES being Affected by the Proposed Management Actions	Change in Habitat Quality Score
Australian Painted Snipe			
<i>Initiate control programs for feral animals, and erect fencing to prevent grazing and trampling of wetlands by cattle, at suitable wetlands</i>	Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required. In addition, Rotational grazing of cattle will be implemented within the offset area.	All Australian Painted Snipe habitat components would benefit.	The management action would result in a decrease in reduction in feral animals (including cattle) and an increase in habitat quality score.
<i>Recognised threats include the replacement of endemic wetland vegetation by invasive, noxious weeds.</i>	The procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer.	All Australian Painted Snipe habitat components would benefit.	The management action would result in a decrease in non-native plant cover, and an increase in habitat quality score.
<i>Develop and implement a suitable fire management strategy for the habitat of the Australian painted snipe</i>	Creation and maintenance of fire tracks (fire breaks) for fire control will be undertaken.	All Australian Painted Snipe habitat components would benefit.	The management action would result in an increase in quality and availability of foraging and breeding habitat, reduction in the threats, and increase in habitat quality score.
Squatter Pigeon (southern)			
<i>Protect sub-populations of the subspecies through the development of covenants and conservation agreements, or by including them in reserve tenure.</i>	The species' habitat in the proposed offset area would be secured as a Nature Reserve.	All Squatter Pigeon (southern) habitat components would benefit.	The management measures that accompany the Nature Reserve would result in an improvement of the habitat quality score.
<i>Manage threats to areas of vegetation that support important sub-populations of the Squatter Pigeon (southern).</i> Recognised threats include: <ul style="list-style-type: none"> • Loss of habitat; • degradation of habitat by invasive weeds; • predation from feral cats 	No vegetation in or adjacent patches of suitable habitat would be cleared, unless required for management purposes (e.g. fire breaks). The procedure for controlling and monitoring environmental weeds/restricted invasive plants will be implemented annually, during spring to early summer. Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required.	All Squatter Pigeon (southern) habitat components would benefit.	The management action would result in a decrease in non-native plant cover, an increase in quality and availability of foraging and shelter habitat, reduction in the threats, and increase in habitat quality score.

Table 2-1 (Continued)
Justification for the Proposed Management Measures and Subsequent Increase in Habitat Quality Score

Recognised Management Actions as per the DEE SPRAT Profile	Pembroke Proposed Management Actions	Specific Habitat Requirements of the MNES being Affected by the Proposed Management Actions	Change in Habitat Quality Score
<i>Protect and rehabilitate areas of vegetation that support important sub-populations.</i>	The primary method for regenerating the offset areas will be through management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition.	All Squatter Pigeon (southern) habitat components would benefit.	The management action would result in an increase in context and connectedness of suitable habitat, quality and availability of foraging and shelter habitat and increase in habitat quality score.
<i>Develop and implement a stock management plan for key sites.</i>	Rotational grazing of cattle will be implemented within the offset area.	Improve the quality of the understory habitat for the Squatter Pigeon (southern)	The management action would result in an increase in quality and availability of foraging habitat and increase in habitat quality score.
<i>Develop and implement a management plan, or nominate an existing plan to be implemented, for the control and eradication of feral herbivores in areas inhabited by the squatter pigeon (southern).</i>	An Offset Management Plan would be developed for the offset areas and contain measures for feral animal control. Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required.	Improve the quality of the understory habitat for the Squatter Pigeon (southern)	The management action would result in an increase in quality and availability of foraging habitat and increase in habitat quality score.
<i>Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them, if necessary.</i>	MNES fauna relevant to the offset area will be monitored over time to document their usage of the offset area and determine the success of the management actions being implemented.	All Squatter Pigeon (southern) habitat components would benefit.	Monitoring would confirm the success of the management actions and allow Pembroke to adjust the actions if required, making sure that habitat quality scores would continue to increase.
Koala			
<i>Development plans should explicitly address ways to mitigate risk of vehicle strike when development occurs adjacent to, or within, Koala habitat.</i>	Access into the offset areas will be restricted to authorised personnel. Locks will be installed on gates into the offset areas and vehicles will be restricted to designated access tracks. Speed limits of 60 km per hour will be imposed on vehicles using access tracks.	All Koala habitat components would benefit.	The management action would result in decrease in the threats to the Koala and increase in habitat quality score.
<i>Develop and implement a management plan to control the adverse impacts of predation on Koalas by dogs in urban, peri-urban and rural environments.</i>	Appropriately qualified persons will be engaged to undertake pest animal control annually or more frequently as required.	All Koala habitat components would benefit.	The management action would result in decrease in the threats to the Koala and increase in habitat quality score.

Table 2-1 (Continued)
Justification for the Proposed Management Measures and Subsequent Increase in Habitat Quality Score

Recognised Management Actions as per the DEE SPRAT Profile	Pembroke Proposed Management Actions	Specific Habitat Requirements of the MNES being Affected by the Proposed Management Actions	Change in Habitat Quality Score
<i>Develop and implement options of vegetation recovery and re-connection in regions containing fragmented Koala populations, including inland regions in which Koala populations were diminished by drought and coastal regions where development pressures have isolated Koala populations.</i>	The primary method for regenerating the offset areas will be through management of threatening processes that inhibit natural regeneration. In the unlikely event that natural regeneration is not readily occurring or species composition is poor, contingency measures include active seeding/planting or disturbance to reduce competition.	All Koala habitat components would benefit.	The management action would result in an increase in context and connectedness of suitable habitat, quality and availability of foraging and shelter habitat and increase in habitat quality score.
<i>Investigate formal conservation arrangements, management agreements and covenants on private land, and, for both Crown and private land, investigate and/or secure inclusion of habitat critical to the survival of the Koala in reserve tenure, if possible.</i>	The species' habitat in the proposed offset area would be secured as a Nature Reserve.	All Koala habitat components would benefit.	The management measures that accompany the Nature Reserve would result in an improvement of the habitat quality score.
<i>Develop and implement a development planning protocol to be used in areas of Koala sub-populations or sub-population fragments to prevent loss of Koala sub-populations, habitat critical to the survival of the species and vital habitat connectivity.</i>	MNES fauna relevant to the offset area will be monitored over time to document their usage of the offset area and determine the success of the management actions being implemented.	All Koala habitat components would benefit.	Monitoring would confirm the success of the management actions and allow Pembroke to adjust the actions if required, making sure that habitat quality scores would continue to increase.
<i>Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them, if necessary.</i>			
Greater Glider			
<i>Removal of barbed wire fencing to avoid entanglement</i>	Barbed wire fencing within the offset area will be removed upon control of grazing.	All Greater Glider habitat components would benefit.	The management action would result in decrease in the threats to the Greater Glider and increase in habitat quality score.
<i>Reduce the frequency and intensity of prescribed burns.</i>	Creation and maintenance of fire tracks (fire breaks) for fire control will be undertaken.	All Greater Glider habitat components would benefit.	The management action would result in an increase in quality and availability of foraging and shelter habitat, reduction in the threats, and increase in habitat quality score.

Table 2-1 (Continued)
Justification for the Proposed Management Measures and Subsequent Increase in Habitat Quality Score

Recognised Management Actions as per the DEE SPRAT Profile	Pembroke Proposed Management Actions	Specific Habitat Requirements of the MNES being Affected by the Proposed Management Actions	Change in Habitat Quality Score
<i>Constrain clearing in forests with significant subpopulations, to retain hollow-bearing trees and suitable habitat.</i>	No vegetation in or adjacent patches of suitable habitat would be cleared to retain hollow bearing trees, unless required for management purposes (e.g. fire breaks).	All Greater Glider habitat components would benefit.	The management action would result in an increase in context and connectedness of suitable habitat, quality and availability of foraging and shelter habitat and increase in habitat quality score.
<i>Avoid fragmentation and habitat loss due to development and upgrades of transport corridors.</i>			
<i>Develop conservation covenants on lands with high value for this species.</i>	The species' habitat in the proposed offset area would be secured as a Nature Reserve.	All Greater Glider habitat components would benefit.	The management measures that accompany the Nature Reserve would result in an improvement of the habitat quality score.

ATTACHMENT 3

JUSTIFICATION FOR THE ADDITIONALITY OF THE PROPOSED WEED AND PEST ANIMAL MANAGEMENT

Table 3-1
Weed and Pest Animal Management – Comparison between the *Biosecurity Act, 2014* and the Proposed Management of the Offset Areas

Aspect	<i>Biosecurity Act, 2014</i>	Proposed Management of the Offset Areas
Weeds		
Measures to <u>reduce spread</u> of prohibited or restricted invasive plants and prevent weeds from leaving property.	✓	✓
Measures to prevent new weeds entering property.	✓	✓
Overall reduction in abundance of weeds across the property.	✗	✓
Targeted control of naturalised pasture grasses such as Buffel Grass (<i>Cenchrus ciliaris</i>).	✗	✓
Targeted control of environmental weeds such as Castor Oil Plant (<i>Ricinus communis</i>) and Stinking Passion Flow (<i>Passiflora foetida</i>).	✗	✓
Structured management plan*	✗	✓
Weed reduction targets and completion criteria.	✗	✓
Regular targeted control of listed weed species.	✗	✓
Regular weed monitoring*	✗	✓
Regular weed reporting*	✗	✓
Internal and independent compliance auditing.	✗	✓
Implementation of control measures and monitoring by a suitably qualified expert*	✗	✓
Pests		
Feeding or keeping vertebrate pest species.	✓	✓
Transporting or releasing pest species to/from property.	✓	✓
Measures to reduce abundance and spread of invasive animals which pose a biosecurity risk (e.g. dog, cat, fox, rabbit)*	✓	✓
Reduction and removal of livestock.	✗	✓
Structured management plan*	✗	✓
Pest reduction targets and completion criteria.	✗	✓
Regular targeted control of invasive pest species including trapping, shooting and baiting*	✗	✓
Regular pest animal monitoring*	✗	✓
Regular pest animal reporting*	✗	✓
Internal and independent compliance auditing.	✗	✓
Implementation of control measures and monitoring by a suitably qualified expert.	✗	✓

* Consistent with the control of threats within relevant Threat Abatement Plans.

ATTACHMENT 4

TERRESTRIAL HABITAT QUALITY SCORES FOR THE STAGE 1 IMPACT AREA

Site: Impact 3.2BC01 – Greater glider habitat	Assessor – Bruce McLennan
Property: Wynette	Date: 06/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.14530; 148.29825
50 m (centre point):	-22.14569; 148.29836
100 m (end point):	-22.14618; 148.29845
Elevation (mAHD):	199
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial levee
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	16
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness:	3
<i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i>	
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Ficus opposita</i> , <i>Sida hackettiana</i>	6
Grass spp. richness: <i>Eragrostis elongata</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i>	7
Forb spp. richness: <i>Heliotropium ovalifolium</i> , <i>Pterocaulon redolens</i> , <i>Desmodium macrocarpum</i> , <i>Waltheria indica</i> , <i>Rhynchosia minima</i> , <i>Vittadinia sp.</i> , <i>Chamaecrista absus</i> , <i>Cyperus sp.</i> , <i>Cyperus exaltatus</i> , <i>Cyperus gracilis</i> , <i>Tephrosia sp.</i> , <i>Dianella nervosa</i>	12
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Lantana camara</i> , <i>Scoparia dulcis</i> , <i>Urochloa mosambicensis</i> , <i>Bidens pilosa</i> , <i>Melinis repens</i> , <i>Megathyrsus maximus</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i>	20

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	9.1
Native perennial grass cover (1 m x 1 m plots)	% cover	27
Litter cover (1 m x 1 m plots)	% cover	66
Coarse woody debris (from 50 m x 20 m plot)	m / ha	140
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	25
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	10	Mobility	10	7
Fallen woody material	5	2	Site location	5	4
Weed cover	10	5	Total	50	29
Litter cover	5	3	Site + landscape	106	82
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	111

Habitat quality score:

7

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.2BC02 – greater glider habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.12009; 148.27162
50 m (centre point):	-22.12001; 148.27115
100 m (end point):	-22.11987; 148.27072
Elevation (mAHD):	197
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box grassy woodland
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	8
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	16
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	11
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Acacia excelsa</i> , <i>Lysiphyllum hookeri</i> , <i>Corymbia clarksoniana</i>	4
50 x 10 m area	
Shrub spp. richness: <i>L. hookeri</i> , <i>Acacia salicina</i> , <i>A. excelsa</i> , <i>Cassia brewsteri</i>	4
Grass spp. richness: <i>Chrysopogon fallax</i> , <i>Enteropogon ramosus</i> , <i>Aristida jerichoensis</i> , <i>Eragrostis lacunaria</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Enneapogon sp.</i> , <i>Aristida holathera</i>	8
Forb spp. richness: <i>Fimbristylis dichotoma</i> , <i>Evolvulus alsinoides</i> , <i>Pterocaulon redolens</i> , <i>Chamaecrista absus</i> , <i>Waltheria indica</i>	5
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Harrisia martinii</i> , <i>Sida spinescens</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i> , <i>Melinis repens</i>	40

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	23.6
Shrub canopy cover (100 m canopy intercept)	% cover	1
Native perennial grass cover (1 m x 1 m plots)	% cover	15
Litter cover (1 m x 1 m plots)	% cover	44
Coarse woody debris (from 50 m x 20 m plot)	m / ha	185
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	4
Native plant species richness: Forbs	5	3	Total:	26	23
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	28
Litter cover	5	5	Site + landscape	106	83
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	111

Habitat quality score:

7

Site photos



Start point, facing WNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC01 – Greater glider habitat	Assessor – Bruce McLennan
Property: Deverill	Date: 17/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.25	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.16626; 148.38077
50 m (centre point):	-22.16641; 148.38126
100 m (end point):	Not recorded
Elevation (mAHD):	185
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum and River she oak on watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	13
Total large trees/ha:	44
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca linariifolia</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Ficus opposita</i> , <i>Atalaya hemiglauca</i> , <i>Jasminum</i> <i>didymum subsp. lineare</i> , <i>Grewia latifolia</i>	5
Grass spp. richness: <i>Chrysopogon fallax</i>	1
Forb spp. richness: <i>Pterocaulon redolens</i>	1
Other spp.: <i>Parsonsia lanceolata</i> , <i>Eustrephus latifolius</i> , <i>Cymbidium canaliculatum</i>	3
Weed spp. and cover as % of area: <i>Megathyrus maximus</i> , <i>Cenchrus ciliaris</i> , <i>Melinis repens</i> , <i>Lantana camara</i> , <i>Stachytarpheta cayennensis</i>	90

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	85.2
Shrub canopy cover (100 m canopy intercept)	% cover	5.7
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	30
Coarse woody debris (from 50 m x 20 m plot)	m / ha	110
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	22
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	0	Quality of shelter	10	10
Large trees	15	15	Mobility	10	10
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + Landscape	106	77
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	118

Habitat quality score:

8

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC02 – Greater glider habitat		Assessor – Bruce McLennan
Property: Winchester Downs		Date: 23/05/2018
Bioregion: Brigalow Belt		Sub-region: Northern Bowen Basin
State mapped RE: 11.3.25		Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description		
0 m (start of transect):		-22.1215; 148.17401
50 m (centre point):		-22.12112; 148.17416
100 m (end point):		-22.12069; 148.17436
Elevation (mAHD):		200
General Site Description		
Landform		Stream channel and banks
Soil		Sand
Dominant vegetation observed		Forest red gum and River she oak on creek channels
100 x 50 m area (0.5 ha)		
Dominant canopy or EDL species with evidence of recruitment (%):		100
Eucalypt large tree DBH (cm): (from benchmark document)		49
Number of large Eucalypt trees:		2
Non-Eucalypt large tree DBH (cm): (from benchmark document)		29
Number of large Non-Eucalypt trees:		3
Total large trees/ha:		10
Tree canopy (EDL) height (m):		20
Sub-canopy height (m):		14
Emergent height (m):		NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca bracteata</i> , <i>Lysiphyllum hookeri</i> , <i>Corymbia clarksoniana</i>		6
50 x 10 m area		
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Acacia salicina</i> , <i>Atalaya hemiglauca</i> , <i>Maireana microphylla</i>		4
Grass spp. richness: <i>Chrysopogon fallax</i>		1
Forb spp. richness: <i>Nyssanthes erecta</i> , <i>Oxalis</i> sp., <i>Rostellularia adscendens</i> , <i>Melhania oblongifolia</i> , <i>Cucumis</i> sp., <i>Evolvulus alsinoides</i> , <i>Vittadinia</i> sp., <i>Einadia</i> sp.		8
Other spp.:		0
Weed spp. and cover as % of area: <i>Megathyrsus maximus</i> , <i>Sida coromandelianum</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes scabra</i> , <i>Cenchrus ciliaris</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Melinis repens</i> , <i>Sida cordifolia</i> , <i>Urochloa mosambicensis</i> , <i>Bothriochloa pilosa</i> , <i>Sida spinescens</i> , <i>Emilia sonchifolia</i> , <i>Tridax procumbens</i>		90

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	0
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	60
Coarse woody debris (from 50 m x 20 m plot)	m / ha	360
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	26
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	28
Litter cover	5	3	Site + Landscape	106	73
Total	80	47	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	101

Habitat quality score:

6

Site photos



Start point, facing NNE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC01 – greater glider habitat	Assessor: Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.17296; 148.37563
50 m (centre point):	-22.1733; 148.3759
100 m (end point):	Not recorded
Elevation (mAHD):	187
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box and Dallachy's gum woodland on light clay plain
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	8
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i> , <i>Owenia acidula</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Eremophila mitchellii</i> , <i>Capparis umbonata</i> , <i>Capparis arborea</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Carissa ovata</i> , <i>Archidendropsis basaltica</i> , <i>Atalaya hemiglauc</i> , <i>Grewia latifolia</i> , <i>Myoporum acuminatum</i> , <i>Eremophila debile</i>	12
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp., <i>Eulalia aurea</i> , <i>Bothriochloa decipiens</i> , <i>Eragrostis sororia</i> , <i>Sporobolus caroli</i> , <i>Panicum effusum</i> , <i>Enteropogon ramosus</i> , <i>Enneapogon avenaceus</i>	12
Forb spp. richness: <i>Apowollastonia spilanthisoides</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Cyperus gracilis</i> , <i>Rostellularia adscendens</i> , <i>Boerhavia drummondii</i> , <i>Dianella nervosa</i> , <i>Alternanthera nana</i> , <i>Vittadinia pustula</i> , <i>Rhynchosia minima</i>	10
Other spp.:	0
Weed spp. and cover as % of area: <i>Lantana camara</i> , <i>Malvastrum americanum</i> , <i>Sida rhombifolia</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	40.3			
Shrub canopy cover (100 m canopy intercept)	% cover	8.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	31			
Litter cover (1 m x 1 m plots)	% cover	41			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	6
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	5	Total	50	36
Litter cover	5	3	Site + landscape	106	70
Total	80	64	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	106

Habitat quality score:

7

Site photos



Start point, facing SSE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC02 – greater glider habitat	Assessor: Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.18526; 148.34521
50 m (centre point):	-22.18554; 148.34563
100 m (end point):	-22.1858; 148.34602
Elevation (mAHD):	198
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box woodland on old sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	8
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Alphitonia excelsa</i> , <i>Owenia acidula</i> , <i>Corymbia clarksoniana</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> <i>subsp. lineare</i> , <i>Archidendropsis basaltica</i> , <i>Grewia latifolia</i> , <i>Myoporum</i> <i>acuminatum</i>	9
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida</i> <i>ingrata</i> , <i>Cymbopogon queenslandicus</i> , <i>Enteropogon acicularis</i> , <i>Eragrostis sp.</i> , <i>Aristida sp.</i>	8
Forb spp. richness: <i>Waltheria indica</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhanian</i> <i>oblongifolia</i> , <i>Rostellularia adscendens</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i>	7
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes</i> <i>scabra</i> , <i>Sida cordifolia</i>	60

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	52.8			
Shrub canopy cover (100 m canopy intercept)	% cover	1.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	11			
Litter cover (1 m x 1 m plots)	% cover	30			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	275			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	6
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	4
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	18
Litter cover	5	5			
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	81

Habitat quality score:

5

Site photos



Start point, facing SE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC03 – greater glider habitat	Assessor: Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.16472; 148.34341
50 m (centre point):	-22.16505; 148.34305
100 m (end point):	-22.16533; 148.34267
Elevation (mAHD):	194
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box and Dallachy's gum woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	14
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i> , <i>Grevillea parallela</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Ventilago viminalis</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia retusifolia</i> , <i>Capparis lasiantha</i> , <i>Owenia acidula</i> , <i>Carissa ovata</i> , <i>Alphitonia excelsa</i> , <i>Ehretia membranifolia</i> , <i>Atalaya hemiglauca</i> , <i>Enchylaena tomentosa</i> , <i>Corymbia dallachiana</i>	15
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida jerichoensis</i> , <i>Cymbopogon queenslandicus</i> , <i>Bothriochloa bladhii</i> , <i>Eulalia aurea</i> , <i>Enneapogon lindleyanus</i> , <i>Aristida personata</i> , <i>Panicum effusum</i>	10
Forb spp. richness: <i>Afrohybanthus enneaspermus</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhanie oblongifolia</i> , <i>Nyssanthus erecta</i> , <i>Galactia tenuifolia</i> , <i>Rhyncosia minima</i> , <i>Chamaecrista absus</i>	8
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes scabra</i> , <i>Sida cordifolia</i>	30

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	24.2			
Shrub canopy cover (100 m canopy intercept)	% cover	2.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	28			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	15
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	4
Weed cover	10	3	Total	50	27
Litter cover	5	5	Site + landscape	106	81
Total	80	66	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	108

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC04 – greater glider habitat	Assessor: Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.11817; 148.25464
50 m (centre point):	-22.11827; 148.25423
100 m (end point):	-22.11839; 148.2537
Elevation (mAHD):	205
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box grassy woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	18
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	13
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>E. populnea</i> , <i>C. brewsteri</i> , <i>Carissa ovata</i> , <i>Ehretia membranifolia</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida holathera</i> , <i>Bothriochloa bladhii</i> , <i>Bothriochloa decipiens</i> , <i>Alloteropsis semialata</i> , <i>Eragrostis sororia</i>	8
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Fimbristylis dichotoma</i> , <i>Achyranthes aspera</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i> , <i>Chamaecrista absus</i>	6
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Sida spinescens</i> , <i>Stylosanthes scabra</i>	50

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	20			
Shrub canopy cover (100 m canopy intercept)	% cover	10.9			
Native perennial grass cover (1 m x 1 m plots)	% cover	8			
Litter cover (1 m x 1 m plots)	% cover	35			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	95			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	15	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	3	Total	50	20
Litter cover	5	5	Site + landscape	106	82
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	102

Habitat quality score:

7

Site photos



Start point, facing WSW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC01 – greater glider habitat		Assessor: Bruce McLennan	
Property: Iffley		Date: 16/05/2018	
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs	
State mapped RE: 11.5.3/11.4.9 (95/5)		Observed RE: 11.5.9	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.1963; 148.35268	
50 m (centre point):		-22.19591; 148.35249	
100 m (end point):		-22.19549; 148.35228	
Elevation (mAHD):		203	
General Site Description			
Landform		Gently undulating plain	
Soil		Red sands	
Dominant vegetation observed		Narrow leaved ironbark, Clarkson's bloodwood and Dallachy's gum on weathered sands	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm): (from benchmark document)		41	
Number of large Eucalypt trees:		1	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		21	
Number of large Non-Eucalypt trees:		2	
Total large trees/ha:		6	
Tree canopy (EDL) height (m):		20	
Sub-canopy height (m):		9	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus crebra</i> , <i>Corymbia dallachiana</i> , <i>C. clarksoniana</i> , <i>C. tessellaris</i> , <i>Bursaria incana</i>		5	
50 x 10 m area			
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>B. incana</i> , <i>Grewia retusifolia</i> , <i>Alphitonia excelsa</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i> , <i>Sida hackettiana</i>		10	
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp.		5	
Forb spp. richness: <i>Achyranthes aspera</i> , <i>Melhantha oblongifolia</i> , <i>Cyanthillium cinereum</i> , <i>Nyssanthus erecta</i> , <i>Galactia tenuifolia</i> , <i>Calotis cuneifolia</i> , <i>Dianella nervosa</i> , <i>Lomandra confertifolia</i> subsp. <i>pallida</i> , <i>Vittadinia</i> sp., <i>Rhynchosia minima</i>		10	
Other spp.:		0	
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Harrisia martinii</i>		20	

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	30.7			
Shrub canopy cover (100 m canopy intercept)	% cover	4			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	33			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	260			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	6			
Grasses	no. species	9			
Forbs	no. species	11			
Large eucalypts	no. / ha	19			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	17			
Tree canopy cover	%	25			
Native shrub cover	%	10			
Native perennial grass cover	%	26			
Organic litter cover	%	30			
Coarse woody debris	m / ha	342			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	19
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	1	Quality of shelter	10	1
Large trees	15	5	Mobility	10	4
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	22
Litter cover	5	5	Site + landscape	106	76
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	98

Habitat quality score:

6

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC02 – greater glider habitat	Assessor: Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.17054; 148.34081
50 m (centre point):	-22.17097; 148.34074
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Gently undulating plain
Soil	Red sands
Dominant vegetation observed	Corymbia woodland on deeply weathered red sands
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	41
Number of large Eucalypt trees:	3
Non-Eucalypt large tree DBH (cm): (from benchmark document)	21
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	6
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Corymbia tessellaris</i> , <i>C. dallachiana</i> , <i>C. clarksoniana</i> , <i>Alphitonia excelsa</i> , <i>Petalostigma pubescens</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Myoporum acuminatum</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida personata</i>	4
Forb spp. richness: <i>Glycine tomentosa</i> , <i>Melhanina oblongifolia</i> , <i>Cyanthillium cinereum</i> , <i>Vittadinia sulcata</i> , <i>Galactia tenuifolia</i> , <i>Oxalis</i> sp., <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> , <i>Chamaecrista</i> <i>absus</i> , <i>Waltheria indica</i> , <i>Desmodium macrocarpum</i> , <i>Crotalaria mitchellii</i> , <i>Vittadinia</i> sp.	12
Other spp.: <i>Jacquemontia paniculata</i>	1
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Sida</i> <i>spinescens</i> , <i>Lantana camara</i>	30

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	26.4
Shrub canopy cover (100 m canopy intercept)	% cover	2.2
Native perennial grass cover (1 m x 1 m plots)	% cover	18
Litter cover (1 m x 1 m plots)	% cover	37
Coarse woody debris (from 50 m x 20 m plot)	m / ha	560
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	6
Grasses	no. species	9
Forbs	no. species	11
Large eucalypts	no. / ha	19
Large non-eucalypts	no. / ha	1
Tree canopy median height	m	17
Tree canopy cover	%	25
Native shrub cover	%	10
Native perennial grass cover	%	26
Organic litter cover	%	30
Coarse woody debris	m / ha	342

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	3	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	28
Litter cover	5	5	Site + landscape	106	75
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	103

Habitat quality score:

7

Site photos



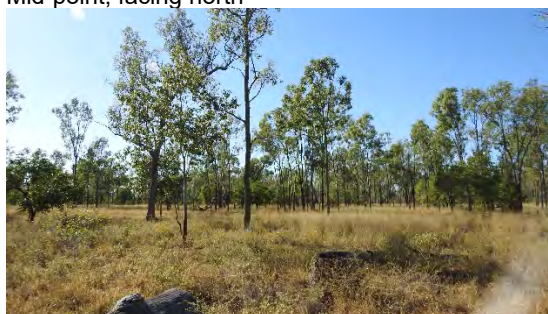
Start point, facing S



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.2BC01 – Koala habitat	Assessor – Bruce McLennan (Arcadian Ecology)
Property: Wynette	Date: 06/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.14530; 148.29825
50 m (centre point):	-22.14569; 148.29836
100 m (end point):	-22.14618; 148.29845
Elevation (mAHD):	199
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial levee
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	16
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness:	3
<i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i>	
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Ficus opposita</i> , <i>Sida hackettiana</i>	6
Grass spp. richness: <i>Eragrostis elongata</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i>	7
Forb spp. richness: <i>Heliotropium ovalifolium</i> , <i>Pterocaulon redolens</i> , <i>Desmodium macrocarpum</i> , <i>Waltheria indica</i> , <i>Rhynchosia minima</i> , <i>Vittadinia sp.</i> , <i>Chamaecrista absus</i> , <i>Cyperus sp.</i> , <i>Cyperus exaltatus</i> , <i>Cyperus gracilis</i> , <i>Tephrosia sp.</i> , <i>Dianella nervosa</i>	12
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Lantana camara</i> , <i>Scoparia dulcis</i> , <i>Urochloa mosambicensis</i> , <i>Bidens pilosa</i> , <i>Melinis repens</i> , <i>Megathyrsus maximus</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i>	20

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	9.1
Native perennial grass cover (1 m x 1 m plots)	% cover	27
Litter cover (1 m x 1 m plots)	% cover	66
Coarse woody debris (from 50 m x 20 m plot)	m / ha	140
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	25
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	10	Mobility	10	7
Fallen woody material	5	2	Site location	5	5
Weed cover	10	5	Total	50	39
Litter cover	5	3	Site + landscape	106	82
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	121

Habitat quality score:

8

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.2BC02 – Koala habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.12009; 148.27162
50 m (centre point):	-22.12001; 148.27115
100 m (end point):	-22.11987; 148.27072
Elevation (mAHD):	197
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box grassy woodland
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	8
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	16
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	11
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Acacia excelsa</i> , <i>Lysiphyllum hookeri</i> , <i>Corymbia clarksoniana</i>	4
50 x 10 m area	
Shrub spp. richness: <i>L. hookeri</i> , <i>Acacia salicina</i> , <i>A. excelsa</i> , <i>Cassia brewsteri</i>	4
Grass spp. richness: <i>Chrysopogon fallax</i> , <i>Enteropogon ramosus</i> , <i>Aristida jerichoensis</i> , <i>Eragrostis lacunaria</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Enneapogon sp.</i> , <i>Aristida holathera</i>	8
Forb spp. richness: <i>Fimbristylis dichotoma</i> , <i>Evolvulus alsinoides</i> , <i>Pterocaulon redolens</i> , <i>Chamaecrista absus</i> , <i>Waltheria indica</i>	5
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Harrisia martinii</i> , <i>Sida spinescens</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i> , <i>Melinis repens</i>	40

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	23.6
Shrub canopy cover (100 m canopy intercept)	% cover	1
Native perennial grass cover (1 m x 1 m plots)	% cover	15
Litter cover (1 m x 1 m plots)	% cover	44
Coarse woody debris (from 50 m x 20 m plot)	m / ha	185
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	4
Native plant species richness: Forbs	5	3	Total:	26	23
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	28
Litter cover	5	5	Site + landscape	106	83
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	111

Habitat quality score:

7

Site photos



Start point, facing WNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC01 – Koala habitat	Assessor – Bruce McLennan
Property: Deverill	Date: 17/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.25	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.16626; 148.38077
50 m (centre point):	-22.16641; 148.38126
100 m (end point):	Not recorded
Elevation (mAHD):	185
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum and River she oak on watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	13
Total large trees/ha:	44
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca linariifolia</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Ficus opposita</i> , <i>Atalaya hemiglaucula</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia latifolia</i>	5
Grass spp. richness: <i>Chrysopogon fallax</i>	1
Forb spp. richness: <i>Pterocaulon redolens</i>	1
Other spp.: <i>Parsonsia lanceolata</i> , <i>Eustrephus latifolius</i> , <i>Cymbidium canaliculatum</i>	3
Weed spp. and cover as % of area: <i>Megathyrsus maximus</i> , <i>Cenchrus ciliaris</i> , <i>Melinis repens</i> , <i>Lantana camara</i> , <i>Stachytarpheta cayennensis</i>	90

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	85.2
Shrub canopy cover (100 m canopy intercept)	% cover	5.7
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	30
Coarse woody debris (from 50 m x 20 m plot)	m / ha	110
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	22
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	0	Quality of shelter	10	10
Large trees	15	15	Mobility	10	10
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + Landscape	106	77
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	118

Habitat quality score:

8

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC02 – Koala habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.25	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.1215; 148.17401
50 m (centre point):	-22.12112; 148.17416
100 m (end point):	-22.12069; 148.17436
Elevation (mAHD):	200
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum and River she oak on creek channels
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	10
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	14
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca bracteata</i> , <i>Lysiphyllum hookeri</i> , <i>Corymbia clarksoniana</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Acacia salicina</i> , <i>Atalaya hemiglaucula</i> , <i>Maireana microphylla</i>	4
Grass spp. richness: <i>Chrysopogon fallax</i>	1
Forb spp. richness: <i>Nyssanthus erecta</i> , <i>Oxalis</i> sp., <i>Rostellularia adscendens</i> , <i>Melhania oblongifolia</i> , <i>Cucumis</i> sp., <i>Evolvulus alsinoides</i> , <i>Vittadinia</i> sp., <i>Einadia</i> sp.	8
Other spp.:	0
Weed spp. and cover as % of area: <i>Megathyrus maximus</i> , <i>Sida coromandelianum</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes scabra</i> , <i>Cenchrus ciliaris</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Melinis repens</i> , <i>Sida cordifolia</i> , <i>Urochloa mosambicensis</i> , <i>Bothriochloa pilosa</i> , <i>Sida spinescens</i> , <i>Emilia sonchifolia</i> , <i>Tridax procumbens</i>	90

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	0
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	60
Coarse woody debris (from 50 m x 20 m plot)	m / ha	360
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	26
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	28
Litter cover	5	3	Site + Landscape	106	73
Total	80	47	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	101

Habitat quality score:

6

Site photos



Start point, facing NNE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC01 – koala habitat	Assessor: Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.17296; 148.37563
50 m (centre point):	-22.1733; 148.3759
100 m (end point):	Not recorded
Elevation (mAHD):	187
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box and Dallachy's gum woodland on light clay plain
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	8
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i> , <i>Owenia acidula</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Eremophila mitchellii</i> , <i>Capparis umbonata</i> , <i>Capparis arborea</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Carissa ovata</i> , <i>Archidendropsis basaltica</i> , <i>Atalaya hemiglauc</i> , <i>Grewia latifolia</i> , <i>Myoporum acuminatum</i> , <i>Eremophila debile</i>	12
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp., <i>Eulalia aurea</i> , <i>Bothriochloa decipiens</i> , <i>Eragrostis sororia</i> , <i>Sporobolus caroli</i> , <i>Panicum effusum</i> , <i>Enteropogon ramosus</i> , <i>Enneapogon avenaceus</i>	12
Forb spp. richness: <i>Apowollastonia spilanthisoides</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Cyperus gracilis</i> , <i>Rostellularia adscendens</i> , <i>Boerhavia drummondii</i> , <i>Dianella nervosa</i> , <i>Alternanthera nana</i> , <i>Vittadinia pustula</i> , <i>Rhynchosia minima</i>	10
Other spp.:	0
Weed spp. and cover as % of area: <i>Lantana camara</i> , <i>Malvastrum americanum</i> , <i>Sida rhombifolia</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	40.3			
Shrub canopy cover (100 m canopy intercept)	% cover	8.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	31			
Litter cover (1 m x 1 m plots)	% cover	41			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	6
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	5	Total	50	28
Litter cover	5	3	Site + landscape	106	70
Total	80	64	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	98

Habitat quality score:

6

Site photos



Start point, facing SSE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC02 – koala habitat	Assessor: Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.18526; 148.34521
50 m (centre point):	-22.18554; 148.34563
100 m (end point):	-22.18580; 148.34602
Elevation (mAHD):	198
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box woodland on old sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	8
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Alphitonia excelsa</i> , <i>Owenia acidula</i> , <i>Corymbia clarksoniana</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> <i>subsp. lineare</i> , <i>Archidendropsis basaltica</i> , <i>Grewia latifolia</i> , <i>Myoporum</i> <i>acuminatum</i>	9
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida</i> <i>ingrata</i> , <i>Cymbopogon queenslandicus</i> , <i>Enteropogon acicularis</i> , <i>Eragrostis sp.</i> , <i>Aristida sp.</i>	8
Forb spp. richness: <i>Waltheria indica</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhania</i> <i>oblongifolia</i> , <i>Rostellularia adscendens</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i>	7
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes</i> <i>scabra</i> , <i>Sida cordifolia</i>	60

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	52.8			
Shrub canopy cover (100 m canopy intercept)	% cover	1.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	11			
Litter cover (1 m x 1 m plots)	% cover	30			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	275			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	6
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	28
Litter cover	5	5			
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91

Habitat quality score:

6

Site photos



Start point, facing SE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC03 – Koala habitat	Assessor: Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.16472; 148.34341
50 m (centre point):	-22.16505; 148.34305
100 m (end point):	-22.16533; 148.34267
Elevation (mAHD):	194
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box and Dallachy's gum woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	14
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i> , <i>Grevillea parallela</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Ventilago viminalis</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia retusifolia</i> , <i>Capparis lasiantha</i> , <i>Owenia acidula</i> , <i>Carissa ovata</i> , <i>Alphitonia excelsa</i> , <i>Ehretia membranifolia</i> , <i>Atalaya</i> <i>hemiglaucula</i> , <i>Enchylaena tomentosa</i> , <i>Corymbia dallachiana</i>	15
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida</i> <i>jerichoensis</i> , <i>Cymbopogon queenslandicus</i> , <i>Bothriochloa bladhii</i> , <i>Eulalia</i> <i>aurea</i> , <i>Enneapogon lindleyanus</i> , <i>Aristida personata</i> , <i>Panicum effusum</i>	10
Forb spp. richness: <i>Afrohybanthus enneaspermus</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhantha oblongifolia</i> , <i>Nyssanthus erecta</i> , <i>Galactia tenuifolia</i> , <i>Rhyncosia</i> <i>minima</i> , <i>Chamaecrista absus</i>	8
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes</i> <i>scabra</i> , <i>Sida cordifolia</i>	30

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	24.2			
Shrub canopy cover (100 m canopy intercept)	% cover	2.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	28			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	15
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	4
Weed cover	10	3	Total	50	31
Litter cover	5	5	Site + landscape	106	81
Total	80	66	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	112

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC04 – koala habitat	Assessor: Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.11817; 148.25464
50 m (centre point):	-22.11827; 148.25423
100 m (end point):	-22.11839; 148.2537
Elevation (mAHD):	205
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box grassy woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	18
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	13
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>E. populnea</i> , <i>C. brewsteri</i> , <i>Carissa ovata</i> , <i>Ehretia membranifolia</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida holathera</i> , <i>Bothriochloa bladhii</i> , <i>Bothriochloa decipiens</i> , <i>Alloteropsis semialata</i> , <i>Eragrostis sororia</i>	8
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Fimbristylis dichotoma</i> , <i>Achyranthes aspera</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i> , <i>Chamaecrista absus</i>	6
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Sida spinescens</i> , <i>Stylosanthes scabra</i>	50

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	20			
Shrub canopy cover (100 m canopy intercept)	% cover	10.9			
Native perennial grass cover (1 m x 1 m plots)	% cover	8			
Litter cover (1 m x 1 m plots)	% cover	35			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	95			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	15	Mobility	10	10
Fallen woody material	5	2	Site location	5	4
Weed cover	10	3	Total	50	27
Litter cover	5	5	Site + landscape	106	82
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	109

Habitat quality score:

7

Site photos



Start point, facing WSW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC01 – koala habitat	Assessor: Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.1963; 148.35268
50 m (centre point):	-22.19591; 148.35249
100 m (end point):	-22.19549; 148.35228
Elevation (mAHD):	203
General Site Description	
Landform	Gently undulating plain
Soil	Red sands
Dominant vegetation observed	Narrow leaved ironbark, Clarkson's bloodwood and Dallachy's gum on weathered sands
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	41
Number of large Eucalypt trees:	1
Non-Eucalypt large tree DBH (cm): (from benchmark document)	21
Number of large Non-Eucalypt trees:	2
Total large trees/ha:	6
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus crebra</i> , <i>Corymbia dallachiana</i> , <i>C. clarksoniana</i> , <i>C. tessellaris</i> , <i>Bursaria incana</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>B. incana</i> , <i>Grewia retusifolia</i> , <i>Alphitonia excelsa</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i> , <i>Sida hackettiana</i>	10
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp.	5
Forb spp. richness: <i>Achyranthes aspera</i> , <i>Melhantha oblongifolia</i> , <i>Cyanthillium cinereum</i> , <i>Nyssanthus erecta</i> , <i>Galactia tenuifolia</i> , <i>Calotis cuneifolia</i> , <i>Dianella nervosa</i> , <i>Lomandra confertifolia</i> subsp. <i>pallida</i> , <i>Vittadinia</i> sp., <i>Rhynchosia minima</i>	10
Other spp.:	0
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Harrisia martinii</i>	20

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	30.7
Shrub canopy cover (100 m canopy intercept)	% cover	4
Native perennial grass cover (1 m x 1 m plots)	% cover	10
Litter cover (1 m x 1 m plots)	% cover	33
Coarse woody debris (from 50 m x 20 m plot)	m / ha	260
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	6
Grasses	no. species	9
Forbs	no. species	11
Large eucalypts	no. / ha	19
Large non-eucalypts	no. / ha	1
Tree canopy median height	m	17
Tree canopy cover	%	25
Native shrub cover	%	10
Native perennial grass cover	%	26
Organic litter cover	%	30
Coarse woody debris	m / ha	342

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	19
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	1	Quality of shelter	10	1
Large trees	15	5	Mobility	10	7
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	17
Litter cover	5	5	Site + landscape	106	76
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93

Habitat quality score:

6

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC02 – koala habitat	Assessor: Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.17054; 148.34081
50 m (centre point):	-22.17097; 148.34074
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Gently undulating plain
Soil	Red sands
Dominant vegetation observed	Corymbia woodland on deeply weathered red sands
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	41
Number of large Eucalypt trees:	3
Non-Eucalypt large tree DBH (cm): (from benchmark document)	21
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	6
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Corymbia tessellaris</i> , <i>C. dallachiana</i> , <i>C. clarksoniana</i> , <i>Alphitonia excelsa</i> , <i>Petalostigma pubescens</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Myoporum acuminatum</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida personata</i>	4
Forb spp. richness: <i>Glycine tomentosa</i> , <i>Melhanina oblongifolia</i> , <i>Cyanthillium cinereum</i> , <i>Vittadinia sulcata</i> , <i>Galactia tenuifolia</i> , <i>Oxalis</i> sp., <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> , <i>Chamaecrista absus</i> , <i>Waltheria indica</i> , <i>Desmodium macrocarpum</i> , <i>Crotalaria mitchellii</i> , <i>Vittadinia</i> sp.	12
Other spp.: <i>Jacquemontia paniculata</i>	1
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Sida spinescens</i> , <i>Lantana camara</i>	30

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	26.4
Shrub canopy cover (100 m canopy intercept)	% cover	2.2
Native perennial grass cover (1 m x 1 m plots)	% cover	18
Litter cover (1 m x 1 m plots)	% cover	37
Coarse woody debris (from 50 m x 20 m plot)	m / ha	560
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	6
Grasses	no. species	9
Forbs	no. species	11
Large eucalypts	no. / ha	19
Large non-eucalypts	no. / ha	1
Tree canopy median height	m	17
Tree canopy cover	%	25
Native shrub cover	%	10
Native perennial grass cover	%	26
Organic litter cover	%	30
Coarse woody debris	m / ha	342

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	3	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	20
Litter cover	5	5	Site + landscape	106	75
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	95

Habitat quality score:

6

Site photos



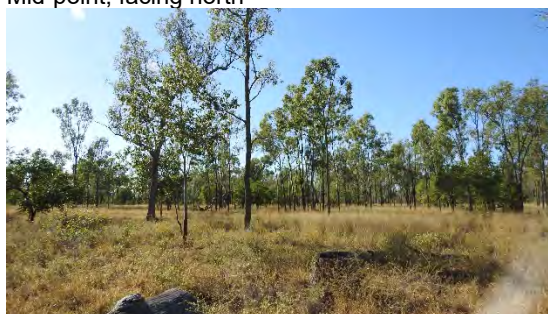
Start point, facing S



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.1BC01 – OS habitat	Assessor – Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.4.9	Observed RE: 11.3.1
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.15934; 148.31157
50 m (centre point):	-22.15913; 148.31201
100 m (end point):	Not recorded
Elevation (mAHD):	191
General Site Description	
Landform	Gently undulating plain - drainage
Soil	Light clay
Dominant vegetation observed	Coolabah and Brigalow woodland on clay soil drainage
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	6
Tree canopy (EDL) height (m):	13
Sub-canopy height (m):	8
Emergent height (m):	15
Total tree species richness: <i>Eucalyptus coolabah</i> , <i>Acacia harpophylla</i> , <i>Lysiphyllum carronii</i> , <i>Brachychiton rupestris</i> , <i>Lysiphyllum hookeri</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Terminalia oblongata</i> , <i>Capparis lasiantha</i> , <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>Alectryon diversifolius</i> , <i>Acacia salicina</i> , <i>Apophyllum anomalum</i> , <i>Alectryon oleifolius</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Abutilon oxycarpum</i>	10
Grass spp. richness: <i>Leptochloa digitata</i> , <i>Enteropogon acicularis</i> , <i>Enteropogon ramosus</i> , <i>Paspalidium jubiflorum</i> , <i>Eragrostis tenellula</i> , <i>Bothriochloa bladhii</i> , <i>Eriochloa sp.</i> , <i>Paspalidium sp.</i>	8
Forb spp. richness: <i>Evolvulus alsinoides</i> , <i>Phyllanthus virgatus</i> , <i>Alternanthera denticulata</i> , <i>Boerhavia dominii</i> , <i>Cyperus sp.</i> , <i>Ipomoea plebeia</i> , <i>Cyperus bifax</i> , <i>Glycine sp.</i> , <i>Oxalis sp.</i> , <i>Dipteracanthus australasicus</i> , <i>Basilicum polystachion</i> , <i>Centipeda minima</i> , <i>Goodenia sp.</i> , <i>Alternanthera sp.</i>	14
Other spp.: <i>Parsonsia sp.</i> , <i>Eustrephus latifolius</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Harrisia martinii</i> , <i>Malvastrum americanum</i> , <i>Parthenium hysterophorus</i> , <i>Malvastrum coromandelianum</i>	45

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	14.7
Shrub canopy cover (100 m canopy intercept)	% cover	3
Native perennial grass cover (1 m x 1 m plots)	% cover	16
Litter cover (1 m x 1 m plots)	% cover	14
Coarse woody debris (from 50 m x 20 m plot)	m / ha	845
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	5
Grasses	no. species	4
Forbs	no. species	8
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	170
Tree canopy median height	m	14
Tree canopy cover	%	29
Native shrub cover	%	8
Native perennial grass cover	%	8
Organic litter cover	%	34
Coarse woody debris	m / ha	1752

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	0
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	4
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	1
Large trees	15	5	Mobility	10	4
Fallen woody material	5	2	Site location	5	1
Weed cover	10	3	Total	50	18
Litter cover	5	3	Site + Landscape	106	60
Total	80	56	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	78

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



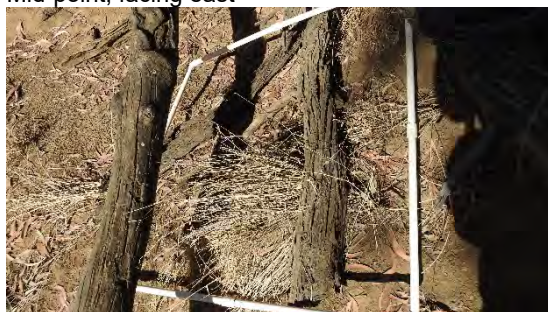
Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.1BC02 – OS habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.1
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.12471; 148.27284
50 m (centre point):	-22.12470; 148.27333
100 m (end point):	Not recorded
Elevation (mAHD):	192
General Site Description	
Landform	Gently undulating plain - drainage
Soil	Light clay
Dominant vegetation observed	Coolabah and Brigalow woodland on clay soil drainage
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	6
Tree canopy (EDL) height (m):	11
Sub-canopy height (m):	6
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus coolabah</i> , <i>Acacia harpophylla</i> , <i>Acacia excelsa</i> , <i>Corymbia dallachiana</i> , <i>Terminalia oblongata</i> , <i>Lysiphyllum hookeri</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>Acacia harpophylla</i> , <i>Acacia salicina</i> , <i>Grewia retusifolia</i> , <i>L. hookeri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Sida hackettiana</i> , <i>Psydrax oleifolius</i>	9
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Chrysopogon fallax</i> , <i>Bothriochloa decipiens</i> , <i>Themeda avenacea</i>	4
Forb spp. richness: <i>Nyssanthes erecta</i> , <i>Rostellularia adscendens</i> , <i>Euphorbia drummondii</i> , <i>Rhynchosia minima</i> , <i>Cyperus</i> sp., <i>Evolvulus alsinoides</i> , <i>Solanum ellipticum</i> , <i>Corchorus trilocularis</i> , <i>Achyranthes aspera</i> , <i>Cyperus gracilis</i> , <i>Commelina diffusa</i> , <i>Dianella nervosa</i>	12
Other spp.: <i>Eustrephus latifolius</i>	1
Weed spp. and cover as % of area: <i>Urochloa mosambicensis</i> , <i>Harrisia martinii</i> , <i>Malvastrum americanum</i> , <i>Parthenium hysterophorus</i> , <i>Malvastrum coromandelianum</i> , <i>Megathyrsus maximus</i> , <i>Eclipta prostrata</i> , <i>Vachellia farnesiana</i> , <i>Sida spinescens</i>	25

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	28.2
Shrub canopy cover (100 m canopy intercept)	% cover	3.4
Native perennial grass cover (1 m x 1 m plots)	% cover	20
Litter cover (1 m x 1 m plots)	% cover	39
Coarse woody debris (from 50 m x 20 m plot)	m / ha	440
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	5
Grasses	no. species	4
Forbs	no. species	8
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	170
Tree canopy median height	m	14
Tree canopy cover	%	29
Native shrub cover	%	8
Native perennial grass cover	%	8
Organic litter cover	%	34
Coarse woody debris	m / ha	1752

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	7
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	15
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	4
Fallen woody material	5	2	Site location	5	1
Weed cover	10	5	Total	50	18
Litter cover	5	5	BioCondition: Site + Landscape	106	75
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93

Habitat quality score:

6

Site photos



Start point, facing E



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 4.9BC01 – OS habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 06/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.5.3/11.4.9 (90/10), 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.4.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.11985; 148.26997
50 m (centre point):	-22.11981; 148.2695
100 m (end point):	-22.11977; 148.26901
Elevation (mAHD):	200
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow woodland on clay plain retreat edge
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	9
Sub-canopy height (m):	5
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> , <i>Lysiphyllum hookeri</i> , <i>Flindersia dissosperma</i> , <i>Alectryon oleifolius</i> , <i>Eucalyptus coolabah</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>Eremophila mitchellii</i> , <i>L. hookeri</i> , <i>Apophyllum anomalum</i> , <i>Ehretia membranifolia</i> , <i>Alectryon diversifolius</i> , <i>Enchylaena tomentosa</i> , <i>Citrus glauca</i> , <i>Maireana microphylla</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Terminalia oblongata</i>	13
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Enteropogon ramosus</i> , <i>Aristida jerichoensis</i> , <i>Paspalidium</i> sp., <i>Panicum effusum</i>	5
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Dipteracanthus australasicus</i> , <i>Abutilon</i> sp., <i>Einadia nutans</i> , <i>Achyranthes aspera</i> , <i>Asperula conferta</i> , <i>Nyssanthus erecta</i> , <i>Plectranthus parviflorus</i> , <i>Euphorbia</i> sp. <i>Abutilon</i> sp.	10
Other spp.: <i>Parsonsia lanceolata</i> , <i>P. eucalyptophylla</i> , <i>Marsdenia australis</i> , <i>Cynanchum viminale</i> subsp. <i>brunonianum</i>	4
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Harrisia martinii</i> , <i>Opuntia tomentosa</i> , <i>Malvastrum americanum</i> , <i>Parthenium hysterophorus</i>	60

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	16.5
Shrub canopy cover (100 m canopy intercept)	% cover	11.5
Native perennial grass cover (1 m x 1 m plots)	% cover	1
Litter cover (1 m x 1 m plots)	% cover	23
Coarse woody debris (from 50 m x 20 m plot)	m / ha	240
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	1
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	0	Quality of shelter	10	1
Large trees	15	0	Mobility	10	1
Fallen woody material	5	2	Site location	5	1
Weed cover	10	0	Total	50	5
Litter cover	5	5	Site + Landscape	106	54
Total	80	43	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	59

Habitat quality score:

4

Site photos



Start point, facing W



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 4.9BC02 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 07/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.4.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.19296; 148.3465
50 m (centre point):	-22.1926; 148.34676
100 m (end point):	-22.19228; 148.34697
Elevation (mAHD):	192
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow on clay plain - drainage
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	27
Total large trees/ha:	54
Tree canopy (EDL) height (m):	14
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> , <i>Lysiphyllum hookeri</i> , <i>Acacia excelsa</i> , <i>Owenia acidula</i> , <i>Santalum lanceolatum</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>O. acidula</i> , <i>S. lanceolatum</i> , <i>E. populneus</i> , <i>Ehretia membranifolia</i> , <i>A. harpophylla</i> , <i>Enchylaena tomentosa</i> , <i>Abutilon oxycarpum</i>	10
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Enteropogon ramosus</i> , <i>Aristida jerichoensis</i> , <i>Paspalidium sp.</i>	4
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Alternanthera denticulata</i>	2
Other spp.: <i>Parsonsia lanceolata</i> , <i>P. eucalyptophylla</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Lantana camara</i> , <i>Stylosanthes scabra</i>	50

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	49.6
Shrub canopy cover (100 m canopy intercept)	% cover	4.7
Native perennial grass cover (1 m x 1 m plots)	% cover	10
Litter cover (1 m x 1 m plots)	% cover	36
Coarse woody debris (from 50 m x 20 m plot)	m / ha	320
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	0
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	8
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	1
Shrub layer cover	5	5	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	1
Large trees	15	15	Mobility	10	1
Fallen woody material	5	2	Site location	5	1
Weed cover	10	0	Total	50	5
Litter cover	5	5	Site + landscape	106	69
Total	80	61	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	74

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 4.9BC03 – OS habitat	Assessor – Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.4.9	Observed RE: 11.4.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.11968; 148.21956
50 m (centre point):	-22.11963; 148.22003
100 m (end point):	-22.1196; 148.22047
Elevation (mAHD):	204
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Brigalow, Poplar box and Red bauhinia on light gilgai clay
100 x 25 m area (0.25 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	5
Total large trees/ha:	20
Tree canopy (EDL) height (m):	11
Sub-canopy height (m):	7.5
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> , <i>Lysiphyllum carronii</i> , <i>Casuarina cristata</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Apophyllum anomalum</i> , <i>Carissa ovata</i> , <i>Terminalia oblongata</i> , <i>L. carronii</i> , <i>Alectryon diversifolius</i> , <i>Ehretia membranifolia</i> , <i>Pittosporum spinescens</i> , <i>Enchylaena tomentosa</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Abutilon oxycarpum</i>	11
Grass spp. richness: <i>Ancistrachne uncinulata</i> , <i>Aristida jerichoensis</i> , <i>Enteropogon acicularis</i>	3
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Einadia nutans</i> , <i>Dysphania sp.</i> , <i>Nyssanthus erecta</i> , <i>Salsola australis</i> , <i>Rostellularia adscendens</i> , <i>Abutilon fraseri</i> , <i>Cheilanthes sieberi</i> , <i>Sida sp.</i>	9
Other spp.: <i>Parsonsia lanceolata</i> , <i>Clematicissus opaca</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Sida spinescens</i> , <i>Harrisia martinii</i> , <i>Malvastrum coromandelianum</i> , <i>Megathyrsus maximus</i> , <i>Parthenium hysterophorus</i> , <i>Gomphrena celosioides</i> , <i>Portulaca oleracea</i>	50

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	21.7
Shrub canopy cover (100 m canopy intercept)	% cover	2.5
Native perennial grass cover (1 m x 1 m plots)	% cover	1
Litter cover (1 m x 1 m plots)	% cover	50
Coarse woody debris (from 50 m x 20 m plot)	m / ha	935
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	0
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	6
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	1
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	5	Mobility	10	7
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	19
Litter cover	5	5	Site + landscape	106	57
Total	80	51	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	76

Habitat quality score:

5

Site photos



Start point, facing E



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact OSBC01 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.19255; 148.38289
50 m (centre point):	-22.19217; 148.38261
100 m (end point):	-22.19180; 148.38231
Elevation (mAHD):	180
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Cleared with strips of Brigalow regrowth on deep gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	3.5
Sub-canopy height (m):	NA
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i>	1
50 x 10 m area	
Shrub spp. richness: <i>Apophyllum anomalum, Enchylaena tomentosa, Abutilon oxycarpum</i>	3
Grass spp. richness: <i>Paspalidium sp., Walwhalleya proluta, Dinebra decipiens, Brachyachne convergens, Eriochloa procera, Sporobolus actinocladius</i>	6
Forb spp. richness: <i>Alternanthera denticulata, Cyperus sp., Basalticum polystachion, Sesbania cannabina, Marsilea sp., Nyssanthes erecta</i>	6
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris, Parthenium hysterophorus, Harrisia martinii, Abutilon guineense</i>	60

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	22.9
Shrub canopy cover (100 m canopy intercept)	% cover	2.2
Native perennial grass cover (1 m x 1 m plots)	% cover	7
Litter cover (1 m x 1 m plots)	% cover	43
Coarse woody debris (from 50 m x 20 m plot)	m / ha	15
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	3	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	4
Native plant species richness: Forbs	5	3	Total:	26	16
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	0	Mobility	10	7
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	38
Litter cover	5	5	Site + landscape	106	54
Total	80	38	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	92

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact OSBC02 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.17608; 148.37694
50 m (centre point):	-22.17595; 148.37740
100 m (end point):	-22.17584; 148.37787
Elevation (mAHD):	181
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow regrowth on lightly gilgaid clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	4.5
Sub-canopy height (m):	NA
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Acacia salicina</i>	2
50 x 10 m area	
Shrub spp. richness: <i>Apophyllum anomalum</i> , <i>Capparis lasiantha</i> , <i>Abutilon oxycarpum</i> , <i>Citrus glauca</i> , <i>Atalaya hemiglauca</i> , <i>Cassia brewsteri</i> , <i>Ventilago viminalis</i> , <i>Terminalia oblongata</i> , <i>Alectryon oleifolius</i>	9
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Bothriochloa bladhii</i> , <i>Eriochloa sp.</i>	3
Forb spp. richness: <i>Alternanthera denticulata</i> , <i>Cyperus bifax</i> , <i>Rhynchosia minima</i> , <i>Sesbania cannabina</i> , <i>Achyranthes aspera</i> , <i>Evolvulus alsinoides</i> , <i>Portulaca sp.</i> , <i>Phyllanthus virgata</i> , <i>Sida sp.</i> , <i>Melhania oblongifolia</i>	10
Other spp.: <i>Clematicissus opaca</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Harrisia martinii</i> , <i>Abutilon guineense</i> , <i>Malvastrum americanum</i> , <i>Parthenium hysterophorus</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i> , <i>Gomphrena celosioides</i>	70

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	24.7
Shrub canopy cover (100 m canopy intercept)	% cover	1.6
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	13
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	14
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	0	Mobility	10	7
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	28
Litter cover	5	3	Site + landscape	106	49
Total	80	35	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	77

Habitat quality score:

5

Site photos



Start point, facing ENE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact OSBC03 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 16/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.20388; 148.35408
50 m (centre point):	-22.20343; 148.35425
100 m (end point):	-22.20306; 148.35440
Elevation (mAHD):	199
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow regrowth on moderately gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	3.0
Sub-canopy height (m):	
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Cassia brewsteri</i>	2
50 x 10 m area	
Shrub spp. richness: <i>Apophyllum anomalum</i> , <i>Alectryon diversifolius</i> , <i>Capparis lasiantha</i> , <i>C. brewsteri</i> , <i>Ehretia membranifolia</i> , <i>Atalaya hemiglauca</i>	6
Grass spp. richness: <i>Cynodon dactylon</i> , <i>Dichanthium sericeum</i> , <i>Eriochloa procera</i> , <i>Enteropogon acicularis</i> , <i>Paspalidium sp.</i> , <i>Eragrostis elongata</i>	6
Forb spp. richness: <i>Cyperus sp.</i> , <i>Balsamicum polystachion</i> , <i>Alternanthera denticulata</i>	3
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes scabra</i> , <i>Megathyrsus maximus</i> , <i>Bothriochloa pertusa</i>	60

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	6.1
Shrub canopy cover (100 m canopy intercept)	% cover	2.9
Native perennial grass cover (1 m x 1 m plots)	% cover	26
Litter cover (1 m x 1 m plots)	% cover	14
Coarse woody debris (from 50 m x 20 m plot)	m / ha	60
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	3	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	16
Tree canopy cover	5	2	Habitat:		
Tree canopy height	5	0	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	31
Litter cover	5	3	Site + landscape	106	50
Total	80	34	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	81

Habitat quality score:

5

Site photos



Start point, facing NNE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact OSBC04 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 17/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.24479; 148.35703
50 m (centre point):	-22.24489; 148.35750
100 m (end point):	-22.24498; 148.35796
Elevation (mAHD):	191
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Cleared with strips of Brigalow regrowth on gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	5.0
Sub-canopy height (m):	NA
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Flindersia dissosperma</i> , <i>Eucalyptus cambageana</i>	3
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>Capparis loranthifolia</i> , <i>Myoporum acuminatum</i> , <i>Enchylaena tomentosa</i>	6
Grass spp. richness: <i>Dichanthium sericeum</i> , <i>Eragrostis</i> sp., <i>Diplachne fusca</i> var. <i>fusca</i> , <i>Eriochloa procera</i> , <i>Eragrostis tenellula</i>	5
Forb spp. richness: <i>Alternanthera denticulata</i> , <i>Cyperus bifax</i> , <i>Dipteracanthus australasicus</i>	3
Other spp.: <i>Clematicissus opaca</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes hamata</i> , <i>Urochloa mosambicensis</i> , <i>Malvastrum americanum</i> , <i>Bothriochloa pertusa</i> , <i>Chloris gayana</i> , <i>Harrisia martinii</i> , <i>Abutilon guineense</i> , <i>Megathyrsus maximus</i> , <i>Chloris inflata</i>	60-70

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	1.2
Shrub canopy cover (100 m canopy intercept)	% cover	1.0
Native perennial grass cover (1 m x 1 m plots)	% cover	22
Litter cover (1 m x 1 m plots)	% cover	4
Coarse woody debris (from 50 m x 20 m plot)	m / ha	15
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	5
Shrubs	no. species	10
Grasses	no. species	5
Forbs	no. species	10
Large eucalypts	no. / ha	NA
Large non-eucalypts	no. / ha	45
Tree canopy median height	m	13
Tree canopy cover	%	25
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	45
Coarse woody debris	m / ha	1200

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	3	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	5
Tree canopy cover	5	0	Habitat:		
Tree canopy height	5	3	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	0	Mobility	10	7
Fallen woody material	5	0	Site location	5	1
Weed cover	10	0	Total	50	25
Litter cover	5	0	Site + landscape	106	35
Total	80	30	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	60

Habitat quality score:

4

Site photos



Start point, facing E



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact OSBC05 – OS habitat	Assessor – Bruce McLennan
Property: Iffley	Date: 17/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.8 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.21148; 148.35539
50 m (centre point):	-22.21128; 148.35497
100 m (end point):	-22.21109; 148.35458
Elevation (mAHD):	201
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow and Dawson gum regrowth on tight clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	38
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	22
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	4.0
Sub-canopy height (m):	NA
Emergent height (m):	11.5
Total tree species richness: <i>Eucalyptus cambageana</i> , <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> , <i>Flindersia dissosperma</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>C. brewsteri</i> , <i>Atalaya hemiglauca</i> , <i>Citrus glauca</i> , <i>Owenia acidula</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Acacia excelsa</i> , <i>Myoporum acuminatum</i> , <i>Abutilon oxycarpum</i>	9
Grass spp. richness: <i>Dichanthium sericeum</i> , <i>Paspalidium caespitosum</i> , <i>Eragrostis</i> sp., <i>Sporobolus caroli</i> , <i>Chloris</i> sp., <i>Heteropogon contortus</i> , <i>Bothriochloa</i> sp., <i>Aristida queenslandicus</i> , <i>Themeda triandra</i> , <i>Eulalia aurea</i>	10
Forb spp. richness: <i>Alternanthera nana</i> , <i>Cyanthillium cinereum</i> , <i>Glycine</i> sp.	3
Other spp.: <i>Jacquemontia paniculata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes scabra</i> , <i>Urochloa mosambicensis</i> , <i>Malvastrum americanum</i> , <i>Sida rhombifolia</i> , <i>Melinis repens</i> , <i>Opuntia tomentosa</i> , <i>Chloris inflata</i>	20

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	7.9
Shrub canopy cover (100 m canopy intercept)	% cover	8.7
Native perennial grass cover (1 m x 1 m plots)	% cover	19
Litter cover (1 m x 1 m plots)	% cover	13
Coarse woody debris (from 50 m x 20 m plot)	m / ha	125
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	10
Grasses	no. species	9
Forbs	no. species	7
Large eucalypts	no. / ha	38
Large non-eucalypts	no. / ha	28
Tree canopy median height	m	17
Tree canopy cover	%	40
Native shrub cover	%	5
Native perennial grass cover	%	20
Organic litter cover	%	37
Coarse woody debris	m / ha	813

Site assessment scoring sheet

Scoring sheet

Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	16
Tree canopy cover	5	2	Habitat:		
Tree canopy height	5	0	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	1
Native perennial grass cover	5	5	Quality of shelter	10	1
Large trees	15	0	Mobility	10	7
Fallen woody material	5	2	Site location	5	1
Weed cover	10	5	Total	50	17
Litter cover	5	3	Site + landscape	106	61
Total	80	45	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	78

Habitat quality score:

5

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.27BC01 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Wynette	Date: 06/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.27b	Observed RE: 11.3.27f
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.14966; 148.30249
50 m (centre point):	-22.14937; 148.30212
100 m (end point):	-22.14908; 148.30174
Elevation (mAHD):	192
General Site Description	
Landform	Closed depression – flood channel
Soil	Light clay and alluvial sands
Dominant vegetation observed	Coolabah woodland on sedgy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	46
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	na
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	18
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus coolabah</i> , <i>E. tereticornis</i> , <i>Acacia salicina</i>	3
50 x 10 m area	
Shrub spp. richness: <i>Ludwigia octovalvis</i>	1
Grass spp. richness: <i>Diplachne fusca</i> var. <i>fusca</i> , <i>Walwhalleya proluta</i> , <i>Leersia hexandra</i>	3
Forb spp. richness: <i>Eleocharis plana</i> (dominant), <i>Eleocharis philippinensis</i> , <i>Marsilea drummondii</i> , <i>Centipeda minima</i> , <i>Juncus usitatus</i> , <i>Aeschynomene indica</i> , <i>Cyperus victoriensis</i> , <i>Basilicum polystachion</i> , <i>Alternanthera denticulata</i> , <i>Neptunia monosperma</i> , <i>Cyperus</i> sp.,	11
Other spp.:	
Weed spp. and cover as % of area: <i>Eclipta prostrata</i> , <i>Harrisia martinii</i>	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	48.2			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	12			
Litter cover (1 m x 1 m plots)	% cover	0			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	130			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	1			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	6			
Large eucalypts	no. / ha	28			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	16			
Tree canopy cover	%	40			
Native shrub cover	%	NA			
Native perennial grass cover	%	3			
Organic litter cover	%	15			
Coarse woody debris	m / ha	530			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	5	Total:	26	16
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	10	Total	50	33
Litter cover	5	0	Site + landscape	106	83
Total	80	67	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	116

Habitat quality score:

7

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.27BC02 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Wynette	Date: 07/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.3.27b	Observed RE: 11.3.27f
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.15956; 148.34442
50 m (centre point):	-22.15915; 148.34442
100 m (end point):	-22.15864; 148.34442
Elevation (mAHD):	191
General Site Description	
Landform	Closed depression – flood channel
Soil	Light clay and alluvial sands
Dominant vegetation observed	Forest Red gum woodland on sedgy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	46
Number of large Eucalypt trees:	13
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	26
Total large trees/ha:	0
Tree canopy (EDL) height (m):	25
Sub-canopy height (m):	10
Emergent height (m):	na
Total tree species richness: <i>E. tereticornis</i> , <i>Acacia salicina</i> , <i>E. tereticornis</i> x <i>E. platyphylla</i>	3
50 x 10 m area	
Shrub spp. richness: <i>E. tereticornis</i> , <i>Ludwigia octovalvis</i>	1
Grass spp. richness: <i>Eriochloa procera</i> , <i>Dinebra decipiens</i> , <i>Digitaria</i> sp., <i>Dichanthium</i> sp., <i>Eragrostis elongata</i> , <i>Cynodon dactylon</i> , <i>Brachyachne convergens</i>	7
Forb spp. richness: <i>Marsilea mutica</i> , <i>Sesbania cannabina</i> , <i>Juncus usitatus</i> , <i>Aeschynomene indica</i> , <i>Cyperus exaltatus</i> , <i>Basilicum polystachion</i> , <i>Persicaria strigosa</i> , <i>Cucumis argenteus</i>	8
Other spp.:	
Weed spp. and cover as % of area: <i>Eclipta prostrata</i> , <i>Symphyotrichum subulatum</i> , <i>Melochia pyramidata</i> , <i>Passiflora foetida</i> , <i>Erigeron bonariensis</i> , <i>Xanthium occidentale</i> , <i>Macroptilium lathyroides</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	82.4			
Shrub canopy cover (100 m canopy intercept)	% cover	1.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	66			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	250			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	1			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	6			
Large eucalypts	no. / ha	46			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	16			
Tree canopy cover	%	40			
Native shrub cover	%	NA			
Native perennial grass cover	%	3			
Organic litter cover	%	15			
Coarse woody debris	m / ha	530			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	5	Total:	26	18
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	88
Total	80	70	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	116

Habitat quality score:

7

Site photos



Start point, facing N



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.17BC01 – Painted Snipe habitat		Assessor – Bruce McLennan	
Property: Iffley		Date: 07/05/2018	
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs	
State mapped RE: 11.5.17		Observed RE: 11.5.17	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.22313; 148.35306	
50 m (centre point):		-22.22321; 148.35350	
100 m (end point):		-22.22334; 148.35397	
Elevation (mAHD):		203	
General Site Description			
Landform		Closed depression	
Soil		Light clay	
Dominant vegetation observed		Grasses and sedges – wetland with mostly dead canopy	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		0	
Eucalypt large tree DBH (cm): (from benchmark document)		44	
Number of large Eucalypt trees:		6	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		NA	
Number of large Non-Eucalypt trees:		0	
Total large trees/ha:		12	
Tree canopy (EDL) height (m):		13	
Sub-canopy height (m):		Not recorded	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus populnea</i>		1	
50 x 10 m area			
Shrub spp. richness:		0	
Grass spp. richness: <i>Brachyachne convergens, Dinebra decipiens, Diplachne fusca var. fusca</i>		3	
Forb spp. richness: <i>Ludwigia peplioides, Cyperus exaltatus, Persicaria attenuata, Basilicum polystachion, Polygonum plebeium, Eleocharis plana, Glinus lotoides</i>		7	
Other spp.:			
Weed spp. and cover as % of area: <i>Echinochloa colona, Stylosanthes scabra, Eclipta prostrata, Cucumis anquria var. anquria</i>		<5	

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	0			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	8			
Litter cover (1 m x 1 m plots)	% cover	83			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	25			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	0	Size of patch	10	0
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	2.5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	9
Tree canopy cover	5	0	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	5	Mobility	10	10
Fallen woody material	5	0	Site location	5	1
Weed cover	10	10	Total	50	38
Litter cover	5	3	Site + landscape	106	48.5
Total	80	39.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	86.5

Habitat quality score:

6

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.17BC02 – Painted Snipe habitat		Assessor – Bruce McLennan
Property: Wynette		Date: 19/05/2018
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.17		Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description		
0 m (start of transect):		-22.16917; 148.32504
50 m (centre point):		-22.16940; 148.32463
100 m (end point):		-22.16963; 148.32419
Elevation (mAHD):		202
General Site Description		
Landform		Closed depression
Soil		Light clay
Dominant vegetation observed		Forest red gum woodland over a grassy depression
100 x 50 m area (0.5 ha)		
Dominant canopy or EDL species with evidence of recruitment (%):		100
Eucalypt large tree DBH (cm): (from benchmark document)		44
Number of large Eucalypt trees:		3
Non-Eucalypt large tree DBH (cm): (from benchmark document)		NA
Number of large Non-Eucalypt trees:		0
Total large trees/ha:		6
Tree canopy (EDL) height (m):		17
Sub-canopy height (m):		6
Emergent height (m):		NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i>		2
50 x 10 m area		
Shrub spp. richness: <i>Ludwigia octovalvis</i>		1
Grass spp. richness: <i>Eragrostis elongata</i> , <i>Dinebra decipiens</i> , <i>Cynodon dactylon</i>		3
Forb spp. richness: <i>Chamaecrista</i> sp., <i>Cyperus victoriensis</i> , <i>Polygonum plebeium</i> , <i>Cyperus</i> sp., <i>Glinus lotoides</i> , <i>Cyperus difformis</i>		6
Other spp.:		-
Weed spp. and cover as % of area: <i>Echinochloa colona</i> , <i>Urochloa mosambicensis</i> , <i>Eclipta prostrata</i> , <i>Lanana montevidensis</i> , <i>Passiflora foetida</i> , <i>Heliotropium indicum</i> , <i>Senna occidentalis</i>		<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	7.6			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	42			
Litter cover (1 m x 1 m plots)	% cover	19			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	735			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	3			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	0
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	9
Tree canopy cover	5	2	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	64
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	92

Habitat quality score:

6

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.2BC01 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Wynette	Date: 06/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.14530; 148.29825
50 m (centre point):	-22.14569; 148.29836
100 m (end point):	-22.14618; 148.29845
Elevation (mAHD):	199
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial levee
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	16
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i>	3
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Ficus opposita</i> , <i>Sida hackettiana</i>	6
Grass spp. richness: <i>Eragrostis elongata</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i>	7
Forb spp. richness: <i>Heliotropium ovalifolium</i> , <i>Pterocaulon redolens</i> , <i>Desmodium macrocarpum</i> , <i>Waltheria indica</i> , <i>Rhynchosia minima</i> , <i>Vittadinia sp.</i> , <i>Chamaecrista absus</i> , <i>Cyperus sp.</i> , <i>Cyperus exaltatus</i> , <i>Cyperus gracilis</i> , <i>Tephrosia sp.</i> , <i>Dianella nervosa</i>	12
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Lantana camara</i> , <i>Scoparia dulcis</i> , <i>Urochloa mosambicensis</i> , <i>Bidens pilosa</i> , <i>Melinis repens</i> , <i>Megathyrsus maximus</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i>	20

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	9.1
Native perennial grass cover (1 m x 1 m plots)	% cover	27
Litter cover (1 m x 1 m plots)	% cover	66
Coarse woody debris (from 50 m x 20 m plot)	m / ha	140
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	25
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	5	Total	50	36
Litter cover	5	3	Site + landscape	106	82
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	118

Habitat quality score:

8

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.2BC02 – Squatter pigeon habitat		Assessor – Bruce McLennan	
Property: Winchester Downs		Date: 23/05/2018	
Bioregion: Brigalow Belt		Sub-region: Northern Bowen Basin	
State mapped RE: 11.3.2/11.3.7/11.3.1 (70/25/5)		Observed RE: 11.3.2	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.12009; 148.27162	
50 m (centre point):		-22.12001; 148.27115	
100 m (end point):		-22.11987; 148.27072	
Elevation (mAHD):		197	
General Site Description			
Landform		Gently undulating plain	
Soil		Sandy loam	
Dominant vegetation observed		Poplar box grassy woodland	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm): (from benchmark document)		40	
Number of large Eucalypt trees:		8	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		NA	
Number of large Non-Eucalypt trees:			
Total large trees/ha:		16	
Tree canopy (EDL) height (m):		18	
Sub-canopy height (m):		11	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus populnea, Acacia excelsa, Lysiphyllum hookeri, Corymbia clarksoniana</i>		4	
50 x 10 m area			
Shrub spp. richness: <i>L. hookeri, Acacia salicina, A. excelsa, Cassia brewsteri</i>		4	
Grass spp. richness: <i>Chrysopogon fallax, Enteropogon ramosus, Aristida jerichoensis, Eragrostis lacunaria, Heteropogon contortus, Themeda triandra, Enneapogon sp., Aristida holathera</i>		8	
Forb spp. richness: <i>Fimbristylis dichotoma, Evolvulus alsinoides, Pterocaulon redolens, Chamaecrista absus, Waltheria indica</i>		5	
Other spp.: <i>Cymbidium canaliculatum</i>		1	
Weed spp. and cover as % of area: <i>Cenchrus ciliaris, Harrisia martinii, Sida spinescens, Urochloa mosambicensis, Stylosanthes scabra, Melinis repens</i>		40	

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	23.6
Shrub canopy cover (100 m canopy intercept)	% cover	1
Native perennial grass cover (1 m x 1 m plots)	% cover	15
Litter cover (1 m x 1 m plots)	% cover	44
Coarse woody debris (from 50 m x 20 m plot)	m / ha	185
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	2
Shrubs	no. species	2
Grasses	no. species	9
Forbs	no. species	17
Large eucalypts	no. / ha	22
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	18
Tree canopy cover	%	40
Native shrub cover	%	2
Native perennial grass cover	%	35
Organic litter cover	%	30
Coarse woody debris	m / ha	307

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	4
Native plant species richness: Forbs	5	3	Total:	26	23
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	5	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	46
Litter cover	5	5	Site + landscape	106	83
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	129

Habitat quality score:

8

Site photos



Start point, facing WNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC01 – Squatter pigeon habitat		Assessor – Bruce McLennan	
Property: Deverill		Date: 17/05/2018	
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs	
State mapped RE: 11.3.25		Observed RE: 11.3.25	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.16626; 148.38077	
50 m (centre point):		-22.16641; 148.38126	
100 m (end point):		Not recorded	
Elevation (mAHD):		185	
General Site Description			
Landform		Stream channel and banks	
Soil		Sand	
Dominant vegetation observed		Forest red gum and River she oak on watercourse	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm): (from benchmark document)		49	
Number of large Eucalypt trees:		9	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		29	
Number of large Non-Eucalypt trees:		13	
Total large trees/ha:		44	
Tree canopy (EDL) height (m):		22	
Sub-canopy height (m):		8	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca linariifolia</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i>		6	
50 x 10 m area			
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Ficus opposita</i> , <i>Atalaya hemiglauca</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia latifolia</i>		5	
Grass spp. richness: <i>Chrysopogon fallax</i>		1	
Forb spp. richness: <i>Pterocaulon redolens</i>		1	
Other spp.: <i>Parsonsia lanceolata</i> , <i>Eustrephus latifolius</i> , <i>Cymbidium canaliculatum</i>		3	
Weed spp. and cover as % of area: <i>Megathyrsus maximus</i> , <i>Cenchrus ciliaris</i> , <i>Melinis repens</i> , <i>Lantana camara</i> , <i>Stachytarpheta cayennensis</i>		90	

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	85.2
Shrub canopy cover (100 m canopy intercept)	% cover	5.7
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	30
Coarse woody debris (from 50 m x 20 m plot)	m / ha	110
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	22
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	10
Large trees	15	15	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + Landscape	106	77
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	118

Habitat quality score:

8

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 3.25BC02 – Squatter pigeon habitat		Assessor – Bruce McLennan	
Property: Winchester Downs		Date: 23/05/2018	
Bioregion: Brigalow Belt		Sub-region: Northern Bowen Basin	
State mapped RE: 11.3.25		Observed RE: 11.3.25	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.1215; 148.17401	
50 m (centre point):		-22.12112; 148.17416	
100 m (end point):		-22.12069; 148.17436	
Elevation (mAHD):		200	
General Site Description			
Landform		Stream channel and banks	
Soil		Sand	
Dominant vegetation observed		Forest red gum and River she oak on creek channels	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm): (from benchmark document)		49	
Number of large Eucalypt trees:		2	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		29	
Number of large Non-Eucalypt trees:		3	
Total large trees/ha:		10	
Tree canopy (EDL) height (m):		20	
Sub-canopy height (m):		14	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Casuarina cunninghamiana</i> , <i>Melaleuca bracteata</i> , <i>Lysiphyllum hookeri</i> , <i>Corymbia clarksoniana</i>		6	
50 x 10 m area			
Shrub spp. richness: <i>Lysiphyllum hookeri</i> , <i>Acacia salicina</i> , <i>Atalaya hemiglauca</i> , <i>Maireana microphylla</i>		4	
Grass spp. richness: <i>Chrysopogon fallax</i>		1	
Forb spp. richness: <i>Nyssanthus erecta</i> , <i>Oxalis</i> sp., <i>Rostellularia adscendens</i> , <i>Melhania oblongifolia</i> , <i>Cucumis</i> sp., <i>Evolvulus alsinoides</i> , <i>Vittadinia</i> sp., <i>Einadia</i> sp.		8	
Other spp.:		0	
Weed spp. and cover as % of area: <i>Megathyrsus maximus</i> , <i>Sida coromandelianum</i> , <i>Parthenium hysterophorus</i> , <i>Stylosanthes scabra</i> , <i>Cenchrus ciliaris</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Melinis repens</i> , <i>Sida cordifolia</i> , <i>Urochloa mosambicensis</i> , <i>Bothriochloa pilosa</i> , <i>Sida spinescens</i> , <i>Emilia sonchifolia</i> , <i>Tridax procumbens</i>		90	

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	57.5
Shrub canopy cover (100 m canopy intercept)	% cover	0
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	60
Coarse woody debris (from 50 m x 20 m plot)	m / ha	360
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	6
Native plant species richness: Forbs	5	3	Total:	26	26
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + Landscape	106	73
Total	80	47	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	114

Habitat quality score:

7

Site photos



Start point, facing NNE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC01 – squatter pigeon habitat		Assessor: Bruce McLennan
Property: Iffley		Date: 16/05/2018
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)		Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description		
0 m (start of transect):		-22.17296; 148.37563
50 m (centre point):		-22.1733; 148.3759
100 m (end point):		Not recorded
Elevation (mAHD):		187
General Site Description		
Landform		Gently undulating plain
Soil		Sandy light clay
Dominant vegetation observed		Poplar box and Dallachy's gum woodland on light clay plain
100 x 50 m area (0.5 ha)		
Dominant canopy or EDL species with evidence of recruitment (%):		100
Eucalypt large tree DBH (cm): (from benchmark document)		44
Number of large Eucalypt trees:		4
Non-Eucalypt large tree DBH (cm): (from benchmark document)		34
Number of large Non-Eucalypt trees:		0
Total large trees/ha:		8
Tree canopy (EDL) height (m):		20
Sub-canopy height (m):		9
Emergent height (m):		NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia salicina</i> , <i>Owenia acidula</i>		4
50 x 10 m area		
Shrub spp. richness: <i>Eremophila mitchellii</i> , <i>Capparis umbonata</i> , <i>Capparis arborea</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Carissa ovata</i> , <i>Archidendropsis basaltica</i> , <i>Atalaya hemiglaucula</i> , <i>Grewia latifolia</i> , <i>Myoporum acuminatum</i> , <i>Eremophila debile</i>		12
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp., <i>Eulalia aurea</i> , <i>Bothriochloa decipiens</i> , <i>Eragrostis sororia</i> , <i>Sporobolus caroli</i> , <i>Panicum effusum</i> , <i>Enteropogon ramosus</i> , <i>Enneapogon avenaceus</i>		12
Forb spp. richness: <i>Apowollastonia spilanthisoides</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Cyperus gracilis</i> , <i>Rostellularia adscendens</i> , <i>Boerhavia drummondii</i> , <i>Dianella nervosa</i> , <i>Alternanthera nana</i> , <i>Vittadinia pustula</i> , <i>Rhynchosia minima</i>		10
Other spp.:		0
Weed spp. and cover as % of area:		5
<i>Lantana camara</i> , <i>Malvastrum americanum</i> , <i>Sida rhombifolia</i>		

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	40.3			
Shrub canopy cover (100 m canopy intercept)	% cover	8.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	31			
Litter cover (1 m x 1 m plots)	% cover	41			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	6
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	46
Litter cover	5	3	Site + landscape	106	70
Total	80	64	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	116

Habitat quality score:

7

Site photos



Start point, facing SSE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC02 – squatter pigeon habitat		Assessor: Bruce McLennan	
Property: Iffley		Date: 16/05/2018	
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs	
State mapped RE: 11.5.3/11.4.9 (95/5)		Observed RE: 11.5.3	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.18526; 148.34521	
50 m (centre point):		-22.18554; 148.34563	
100 m (end point):		-22.1858; 148.34602	
Elevation (mAHD):		198	
General Site Description			
Landform		Gently undulating plain	
Soil		Sandy light clay	
Dominant vegetation observed		Poplar box woodland on old sand plains	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm):		44	
(from benchmark document)			
Number of large Eucalypt trees:		4	
Non-Eucalypt large tree DBH (cm):		34	
(from benchmark document)			
Number of large Non-Eucalypt trees:		0	
Total large trees/ha:		8	
Tree canopy (EDL) height (m):		18	
Sub-canopy height (m):		8	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Alphitonia excelsa</i> , <i>Owenia acidula</i> , <i>Corymbia clarksoniana</i>		5	
50 x 10 m area			
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Archidendropsis basaltica</i> , <i>Grewia latifolia</i> , <i>Myoporum acuminatum</i>		9	
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida ingrata</i> , <i>Cymbopogon queenslandicus</i> , <i>Enteropogon acicularis</i> , <i>Eragrostis sp.</i> , <i>Aristida sp.</i>		8	
Forb spp. richness: <i>Waltheria indica</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhania oblongifolia</i> , <i>Rostellularia adscendens</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i>		7	
Other spp.:		0	
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes scabra</i> , <i>Sida cordifolia</i>		60	

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	52.8			
Shrub canopy cover (100 m canopy intercept)	% cover	1.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	11			
Litter cover (1 m x 1 m plots)	% cover	30			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	275			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	6
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	5	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	46
Litter cover	5	5			
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	109

Habitat quality score:

7

Site photos



Start point, facing SE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC03 – squatter pigeon habitat	Assessor: Bruce McLennan
Property: Wynette	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.16472; 148.34341
50 m (centre point):	-22.16505; 148.34305
100 m (end point):	-22.16533; 148.34267
Elevation (mAHD):	194
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box and Dallachy's gum woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	4
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	3
Total large trees/ha:	14
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia dallachiana</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i> , <i>Grevillea parallela</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Ventilago viminalis</i> , <i>Grevillea parallela</i> , <i>Breynia oblongifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia retusifolia</i> , <i>Capparis lasiantha</i> , <i>Owenia acidula</i> , <i>Carissa ovata</i> , <i>Alphitonia excelsa</i> , <i>Ehretia membranifolia</i> , <i>Atalaya hemiglauca</i> , <i>Enchylaena tomentosa</i> , <i>Corymbia dallachiana</i>	15
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida jerichoensis</i> , <i>Cymbopogon queenslandicus</i> , <i>Bothriochloa bladhii</i> , <i>Eulalia aurea</i> , <i>Enneapogon lindleyanus</i> , <i>Aristida personata</i> , <i>Panicum effusum</i>	10
Forb spp. richness: <i>Afrohybanthus enneaspermus</i> , <i>Pterocaulon redolens</i> , <i>Cyanthillium cinereum</i> , <i>Melhania oblongifolia</i> , <i>Nyssanthes erecta</i> , <i>Galactia tenuifolia</i> , <i>Rhyncosia minima</i> , <i>Chamaecrista absus</i>	8
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Stylosanthes scabra</i> , <i>Sida cordifolia</i>	30

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	24.2			
Shrub canopy cover (100 m canopy intercept)	% cover	2.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	28			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	235			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	15
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	5	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	46
Litter cover	5	5	Site + landscape	106	81
Total	80	66	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	127

Habitat quality score:

8

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.3BC04 – koala habitat	Assessor: Bruce McLennan
Property: Winchester Downs	Date: 23/05/2018
Bioregion: Brigalow Belt	Sub-region: Northern Bowen Basin
State mapped RE: 11.5.3/11.4.9 (95/5)	Observed RE: 11.5.3
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.11817; 148.25464
50 m (centre point):	-22.11827; 148.25423
100 m (end point):	-22.11839; 148.25370
Elevation (mAHD):	205
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box grassy woodland on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	18
Tree canopy (EDL) height (m):	20
Sub-canopy height (m):	13
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>Cassia brewsteri</i> , <i>Alectryon oleifolius</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>E. populnea</i> , <i>C. brewsteri</i> , <i>Carissa ovata</i> , <i>Ehretia membranifolia</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida holathera</i> , <i>Bothriochloa bladhii</i> , <i>Bothriochloa decipiens</i> , <i>Alloteropsis semialata</i> , <i>Eragrostis sororia</i>	8
Forb spp. richness: <i>Cyperus gracilis</i> , <i>Fimbristylis dichotoma</i> , <i>Achyranthes aspera</i> , <i>Galactia tenuifolia</i> , <i>Phyllanthus virgata</i> , <i>Chamaecrista absus</i>	6
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Sida spinescens</i> , <i>Stylosanthes scabra</i>	50

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	20			
Shrub canopy cover (100 m canopy intercept)	% cover	10.9			
Native perennial grass cover (1 m x 1 m plots)	% cover	8			
Litter cover (1 m x 1 m plots)	% cover	35			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	95			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	15	Mobility	10	10
Fallen woody material	5	2	Site location	5	1
Weed cover	10	3	Total	50	46
Litter cover	5	5	Site + landscape	106	82
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	128

Habitat quality score:

8

Site photos



Start point, facing WSW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC01 – squatter pigeon habitat		Assessor: Bruce McLennan	
Property: Iffley		Date: 16/05/2018	
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs	
State mapped RE: 11.5.3/11.4.9 (95/5)		Observed RE: 11.5.9	
Transect Co-ordinates (Datum) General Site Description			
0 m (start of transect):		-22.1963; 148.35268	
50 m (centre point):		-22.19591; 148.35249	
100 m (end point):		-22.19549; 148.35228	
Elevation (mAHD):		203	
General Site Description			
Landform		Gently undulating plain	
Soil		Red sands	
Dominant vegetation observed		Narrow leaved ironbark, Clarkson's bloodwood and Dallachy's gum on weathered sands	
100 x 50 m area (0.5 ha)			
Dominant canopy or EDL species with evidence of recruitment (%):		100	
Eucalypt large tree DBH (cm): (from benchmark document)		41	
Number of large Eucalypt trees:		1	
Non-Eucalypt large tree DBH (cm): (from benchmark document)		21	
Number of large Non-Eucalypt trees:		2	
Total large trees/ha:		6	
Tree canopy (EDL) height (m):		20	
Sub-canopy height (m):		9	
Emergent height (m):		NA	
Total tree species richness: <i>Eucalyptus crebra</i> , <i>Corymbia dallachiana</i> , <i>C. clarksoniana</i> , <i>C. tessellaris</i> , <i>Bursaria incana</i>		5	
50 x 10 m area			
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>B. incana</i> , <i>Grewia retusifolia</i> , <i>Alphitonia excelsa</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i> , <i>Sida hackettiana</i>		10	
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Themeda triandra</i> , <i>Enneapogon</i> sp.		5	
Forb spp. richness: <i>Achyranthes aspera</i> , <i>Melhanianthus oblongifolius</i> , <i>Cyanthillium cinereum</i> , <i>Nyssa erecta</i> , <i>Galactia tenuifolia</i> , <i>Calotis cuneifolia</i> , <i>Dianella nervosa</i> , <i>Lomandra confertifolia</i> subsp. <i>pallida</i> , <i>Vittadinia</i> sp., <i>Rhynchosia minima</i>		10	
Other spp.:		0	
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Harrisia martinii</i>		20	

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	30.7			
Shrub canopy cover (100 m canopy intercept)	% cover	4			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	33			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	260			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	6			
Grasses	no. species	9			
Forbs	no. species	11			
Large eucalypts	no. / ha	19			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	17			
Tree canopy cover	%	25			
Native shrub cover	%	10			
Native perennial grass cover	%	26			
Organic litter cover	%	30			
Coarse woody debris	m / ha	342			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	19
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	46
Litter cover	5	5	Site + landscape	106	76
Total	80	57	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	122

Habitat quality score:

8

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: Impact 5.9BC02 – Squatter pigeon habitat		Assessor: Bruce McLennan
Property: Wynette		Date: 19/05/2018
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs
State mapped RE: 11.5.3/11.4.9 (95/5)		Observed RE: 11.5.9
Transect Co-ordinates (Datum) General Site Description		
0 m (start of transect):		-22.17054; 148.34081
50 m (centre point):		-22.17097; 148.34074
100 m (end point):		Not recorded
Elevation (mAHD):		200
General Site Description		
Landform		Gently undulating plain
Soil		Red sands
Dominant vegetation observed		Corymbia woodland on deeply weathered red sands
100 x 50 m area (0.5 ha)		
Dominant canopy or EDL species with evidence of recruitment (%):		100
Eucalypt large tree DBH (cm): (from benchmark document)		41
Number of large Eucalypt trees:		3
Non-Eucalypt large tree DBH (cm): (from benchmark document)		21
Number of large Non-Eucalypt trees:		0
Total large trees/ha:		6
Tree canopy (EDL) height (m):		18
Sub-canopy height (m):		8
Emergent height (m):		NA
Total tree species richness: <i>Corymbia tessellaris</i> , <i>C. dallachiana</i> , <i>C. clarksoniana</i> , <i>Alphitonia excelsa</i> , <i>Petalostigma pubescens</i>		5
50 x 10 m area		
Shrub spp. richness: <i>Petalostigma pubescens</i> , <i>Acacia salicina</i> , <i>Myoporum acuminatum</i> , <i>Grewia latifolia</i> , <i>Eremophila debilis</i>		5
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Chrysopogon fallax</i> , <i>Aristida personata</i>		4
Forb spp. richness: <i>Glycine tomentosa</i> , <i>Melhanina oblongifolia</i> , <i>Cyanthillium cinereum</i> , <i>Vittadinia sulcata</i> , <i>Galactia tenuifolia</i> , <i>Oxalis</i> sp., <i>Euphorbia tannensis</i> subsp. <i>eremophila</i> , <i>Chamaecrista absus</i> , <i>Waltheria indica</i> , <i>Desmodium macrocarpum</i> , <i>Crotalaria mitchellii</i> , <i>Vittadinia</i> sp.		12
Other spp.: <i>Jacquemontia paniculata</i>		1
Weed spp. and cover as % of area: <i>Melinis repens</i> , <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Sida rhombifolia</i> , <i>Sida spinescens</i> , <i>Lantana camara</i>		30

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	26.4
Shrub canopy cover (100 m canopy intercept)	% cover	2.2
Native perennial grass cover (1 m x 1 m plots)	% cover	18
Litter cover (1 m x 1 m plots)	% cover	37
Coarse woody debris (from 50 m x 20 m plot)	m / ha	560
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	3
Shrubs	no. species	6
Grasses	no. species	9
Forbs	no. species	11
Large eucalypts	no. / ha	19
Large non-eucalypts	no. / ha	1
Tree canopy median height	m	17
Tree canopy cover	%	25
Native shrub cover	%	10
Native perennial grass cover	%	26
Organic litter cover	%	30
Coarse woody debris	m / ha	342

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	5
Native plant species richness: Shrubs	5	3	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	20
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	3	Quality of shelter	10	10
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	46
Litter cover	5	5	Site + landscape	106	75
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	121

Habitat quality score:

8

Site photos



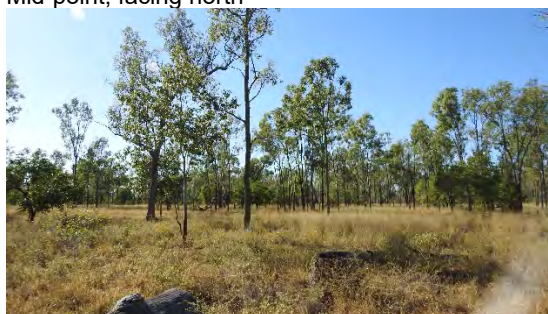
Start point, facing S



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

ATTACHMENT 5

TERRESTRIAL HABITAT QUALITY SCORES FOR THE STAGE 1 OFFSET AREA

Site: 3.2BC01 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04382; 148.47989
50 m (centre point):	-22.04380; 148.47940
100 m (end point):	Not recorded
Elevation (mAHD):	208
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland with shrubby understory on alluvial clay loam
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	14
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>E. crebra</i> , <i>Owenia acidula</i> , <i>Eremophila mitchellii</i> , <i>Alectryon oleifolius</i> , <i>Flindersia australis</i> , <i>F. dissosperma</i> , <i>Acacia excelsa</i> , <i>E. populnea</i> x <i>E. crebra</i> .	8
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Geijera parviflora</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Capparis loranthifolia</i> , <i>Acacia excelsa</i> , <i>Alectryon oleifolius</i> , <i>Denhamia cunninghamii</i> , <i>Acacia oswaldii</i> , <i>Eremophila debile</i>	13
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Enneapogon</i> sp., <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>Aristida</i> sp., <i>Oplismenus</i> sp.	9
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Calotis cuneifolia</i> , <i>Hibiscus sturtii</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Cyperus gracilis</i> , <i>Desmodium macrocarpum</i> .	8
Other spp.: <i>Lomandra multiflora</i> , <i>Parsonsia lanceolata</i> , <i>Jacquemontia paniculata</i> , <i>Eustrephus latifolius</i>	5
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i>	10

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	45.8			
Shrub canopy cover (100 m canopy intercept)	% cover	14			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	38			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	5	Total	50	28
Litter cover	5	5	Site + landscape	106	73
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	101

Habitat quality score:

6

Site photos



Start point, facing W



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.2BC02 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06423; 148.46820
50 m (centre point):	-22.06446; 148.46785
100 m (end point):	-22.06468; 148.46751
Elevation (mAHD):	197
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial clay loam
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	18.5
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>C. tessellaris</i> , <i>Vachellia bidwillii</i> , <i>Alphitonia excelsa</i> , <i>Atalaya hemiglauc</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Atalaya hemiglauc</i> , <i>Acacia excelsa</i> , <i>Abutilon oxycarpum</i> , <i>Eremophila debile</i>	12
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>B. decipiens</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>A. jerichoensis</i> , <i>Enneapogon avenaceus</i> , <i>Enneapogon sp.</i> , <i>Alloteropsis semialata</i> , <i>Eulalia aurea</i>	14
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Apowollastonia spilanthisoides</i> , <i>Commelina diffusa</i> , <i>Hibiscus sp.</i> , <i>Zornia sp.</i> , <i>Melhanian oblongifolia</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Rostellularia adscendens</i> , <i>Calotis cuneifolia</i> , <i>Cyanthillium cinereum</i> , <i>Glycine tomentella</i> , <i>Glycine sp.</i> , <i>Alternanthera denticulata</i> , <i>Cyperus gracilis</i> , <i>Crinum flaccidum</i> , <i>Cyperus sp.</i>	18
Other spp.: <i>Lomandra longifolia</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Gomphrena celosioides</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	48.1			
Shrub canopy cover (100 m canopy intercept)	% cover	9.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	22			
Litter cover (1 m x 1 m plots)	% cover	61			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	82
Total	80	71	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	110

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



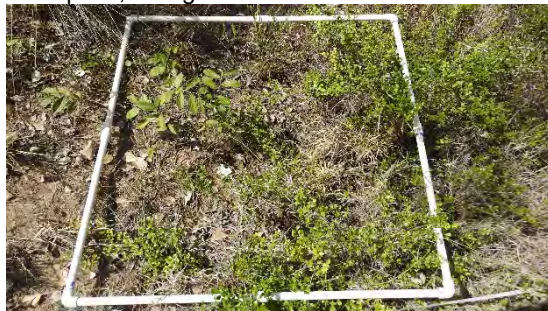
Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC01 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.05728; 148.49925
50 m (centre point):	-22.05704; 148.49968
100 m (end point):	Not recorded
Elevation (mAHD):	193
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum with shrubby understory on alluvial terraces
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	1
Total large trees/ha:	16
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>Corymbia tessellaris</i> , <i>Erythrina vespertilio</i> , <i>Cassia brewsteri</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Capparis loranthifolia</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia latifolia</i> , <i>Grewia retusifolia</i> , <i>Ficus opposita</i> , <i>Acacia salicina</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i>	12
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Bothriochloa bladhii</i> , <i>Aristida</i> sp., <i>Heteropogon contortus</i> , <i>Bothriochloa ewartiana</i>	5
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Commelina diffusa</i> , <i>Waltheria indica</i> , <i>Crotalaria</i> sp., <i>Crinum flaccidum</i> ,	6
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Sida rhombifolia</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i>	80

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	18			
Shrub canopy cover (100 m canopy intercept)	% cover	3.1			
Native perennial grass cover (1 m x 1 m plots)	% cover	2			
Litter cover (1 m x 1 m plots)	% cover	11			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	445			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	17
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	35
Litter cover	5	5	Site + Landscape	106	72
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	107

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC02 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04375; 148.47647
50 m (centre point):	-22.04361; 148.47679
100 m (end point):	-22.04336; 148.47729
Elevation (mAHD):	205
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	12
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	5
Total large trees/ha:	34
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Alphitonia excelsa</i>	9
50 x 10 m area	
Shrub spp. richness: <i>Exocarpos latifolius</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Diospyros humilis</i> , <i>Atalaya hemiglauca</i> , <i>Dodonaea sp.</i> , <i>Grewia latifolia</i> , <i>Sida hackettiana</i>	10
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Themeda triandra</i> , <i>Aristida sp.</i> , <i>Heteropogon contortus</i> , <i>Oplismenus aemulus</i> , <i>Panicum effusum</i> , <i>Eulalia aurea</i>	7
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Ipomoea sp.</i> , <i>Desmodium macrocarpum</i> , <i>Achyranthes aspera</i> , <i>Commelina diffusa</i> , <i>Glycine tabacina</i> , <i>Rhynchosia minima</i>	8
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	3
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i> , <i>Tridax procumbens</i> , <i>Malvastrum americanum</i> , <i>Bothriochloa pertusa</i>	70

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	71			
Shrub canopy cover (100 m canopy intercept)	% cover	16.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	50			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	500			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	19
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	15	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	38
Litter cover	5	3	Site + Landscape	106	79
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	117

Habitat quality score:

8

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC03 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.03214; 148.46191
50 m (centre point):	-22.03231; 148.46239
100 m (end point):	-22.03252; 148.46280
Elevation (mAHD):	212
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	25
Total large trees/ha:	54
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Cassia brewsteri</i>	10
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>Flueggea leucopyrus</i> , <i>Grewia latifolia</i> , <i>Acalypha eremorum</i> , <i>Petalostigma pubescens</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Diospyros humilis</i> , <i>Bursaria incana</i> , <i>Acacia rhodoxylon</i>	19
Grass spp. richness: <i>Themeda avenacea</i> , <i>Themeda triandra</i> , <i>Arundinella nepalensis</i> , <i>Heteropogon contortus</i> , <i>Eragrostis sororia</i> , <i>Eragrostis elongata</i> , <i>Dinebra decipiens</i> , <i>Panicum sp.</i> , <i>Sporobolus creber</i>	9
Forb spp. richness: <i>Glycine tomentella</i> , <i>Phyllanthus virgatus</i> , <i>Pratia concolor</i> , <i>Ipomoea sp.</i>	4
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Solanum seafortianum</i> , <i>Senna occidentalis</i> , <i>Opuntia tomentosa</i> , <i>Stylosanthes scabra</i> , <i>Melochia pyramidata</i>	20

Site: 5.17BC01 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07656; 148.45959
50 m (centre point):	-22.07617; 148.45937
100 m (end point):	-22.07577; 148.45911
Elevation (mAHD):	204
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	4
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i>	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Microlaena stipoides</i>	2
Forb spp. richness: <i>Centipeda minima</i> , <i>Alternanthera nana</i> , <i>Phyllanthus virgatus</i>	3
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Heliotropium indicum</i> , <i>Eclipta prostrata</i> , <i>Passiflora foetida</i>	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	21.8			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	70			
Litter cover (1 m x 1 m plots)	% cover	29			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	395			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	na			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	63.5
Total	80	56.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91.5

Habitat quality score:

6

Site photos



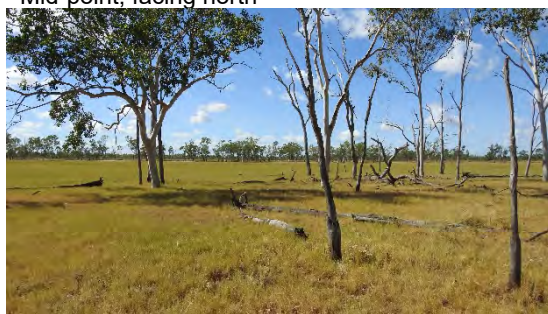
Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC02 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.09204; 148.49074
50 m (centre point):	-22.09177; 148.49109
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	6
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	12
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i>	1
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i>	1
Forb spp. richness: <i>Marsilea sp.</i>	1
Other spp.:	-
Weed spp. and cover as % of area:	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	36.9			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	25			
Litter cover (1 m x 1 m plots)	% cover	75			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	2.5	Total:	26	5
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	0	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	54
Total	80	49	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	82

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC03 – Greater glider habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07801; 148.46028
50 m (centre point):	-22.07781; 148.45988
100 m (end point):	-22.07753; 148.45952
Elevation (mAHD):	208
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum woodland on grassy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	14
Tree canopy (EDL) height (m):	17
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i> , <i>E. tereticornis</i> x <i>E. platyphylla</i> hybrid	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Dinebra decipiens</i> , <i>Eragrostis elongata</i>	3
Forb spp. richness: <i>Cyperus victoriensis</i> , <i>Phyllanthus virgatus</i> , <i>Centipeda minima</i> ,	3
Other spp.:	
Weed spp. and cover as % of area: <i>Sida spinescens</i> , <i>Heliotropium indicum</i> , <i>Passiflora foetida</i>	<1

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	34.6			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	44			
Litter cover (1 m x 1 m plots)	% cover	51			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	365			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	65.5
Total	80	58.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.2BC01 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04382; 148.47989
50 m (centre point):	-22.04380; 148.47940
100 m (end point):	Not recorded
Elevation (mAHD):	208
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland with shrubby understory on alluvial clay loam
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	14
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>E. crebra</i> , <i>Owenia acidula</i> , <i>Eremophila mitchellii</i> , <i>Alectryon oleifolius</i> , <i>Flindersia australis</i> , <i>F. dissosperma</i> , <i>Acacia excelsa</i> , <i>E. populnea</i> x <i>E. crebra</i> .	8
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Geijera parviflora</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Capparis loranthifolia</i> , <i>Acacia excelsa</i> , <i>Alectryon oleifolius</i> , <i>Denhamia cunninghamii</i> , <i>Acacia oswaldii</i> , <i>Eremophila debile</i>	13
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Enneapogon</i> sp., <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>Aristida</i> sp., <i>Oplismenus</i> sp.	9
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Calotis cuneifolia</i> , <i>Hibiscus sturtii</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Cyperus gracilis</i> , <i>Desmodium macrocarpum</i> .	8
Other spp.: <i>Lomandra multiflora</i> , <i>Parsonsia lanceolata</i> , <i>Jacquemontia paniculata</i> , <i>Eustrephus latifolius</i>	5
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i>	10

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	45.8			
Shrub canopy cover (100 m canopy intercept)	% cover	14			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	38			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	5	Total	50	28
Litter cover	5	5	Site + landscape	106	73
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	101

Habitat quality score:

6

Site photos



Start point, facing W



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.2BC02 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06423; 148.46820
50 m (centre point):	-22.06446; 148.46785
100 m (end point):	-22.06468; 148.46751
Elevation (mAHD):	197
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial clay loam
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	18.5
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>C. tessellaris</i> , <i>Vachellia bidwillii</i> , <i>Alphitonia excelsa</i> , <i>Atalaya hemiglauc</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Atalaya hemiglauc</i> , <i>Acacia excelsa</i> , <i>Abutilon oxycarpum</i> , <i>Eremophila debile</i>	12
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>B. decipiens</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>A. jerichoensis</i> , <i>Enneapogon avenaceus</i> , <i>Enneapogon sp.</i> , <i>Alloteropsis semialata</i> , <i>Eulalia aurea</i>	14
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Apowollastonia spilanthisoides</i> , <i>Commelina diffusa</i> , <i>Hibiscus sp.</i> , <i>Zornia sp.</i> , <i>Melhania oblongifolia</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Rostellularia adscendens</i> , <i>Calotis cuneifolia</i> , <i>Cyanthillium cinereum</i> , <i>Glycine tomentella</i> , <i>Glycine sp.</i> , <i>Alternanthera denticulata</i> , <i>Cyperus gracilis</i> , <i>Crinum flaccidum</i> , <i>Cyperus sp.</i>	18
Other spp.: <i>Lomandra longifolia</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Gomphrena celosioides</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	48.1			
Shrub canopy cover (100 m canopy intercept)	% cover	9.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	22			
Litter cover (1 m x 1 m plots)	% cover	61			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	82
Total	80	71	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	110

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



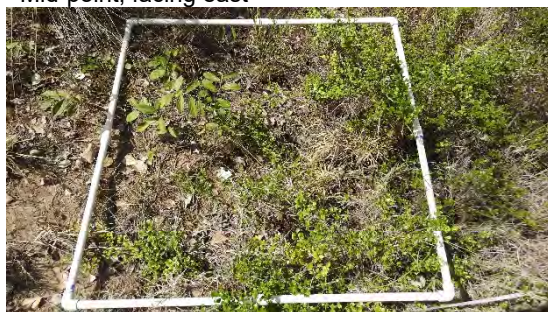
Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC01 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.05728; 148.49925
50 m (centre point):	-22.05704; 148.49968
100 m (end point):	Not recorded
Elevation (mAHD):	193
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum with shrubby understory on alluvial terraces
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	1
Total large trees/ha:	16
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>Corymbia tessellaris</i> , <i>Erythrina vespertilio</i> , <i>Cassia brewsteri</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Capparis loranthifolia</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia latifolia</i> , <i>Grewia retusifolia</i> , <i>Ficus opposita</i> , <i>Acacia salicina</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i>	12
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Bothriochloa bladhii</i> , <i>Aristida</i> sp., <i>Heteropogon contortus</i> , <i>Bothriochloa ewartiana</i>	5
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Commelina diffusa</i> , <i>Waltheria indica</i> , <i>Crotalaria</i> sp., <i>Crinum flaccidum</i>	6
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Sida rhombifolia</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i>	80

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	18
Shrub canopy cover (100 m canopy intercept)	% cover	3.1
Native perennial grass cover (1 m x 1 m plots)	% cover	2
Litter cover (1 m x 1 m plots)	% cover	11
Coarse woody debris (from 50 m x 20 m plot)	m / ha	445
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	4
Shrubs	no. species	2
Grasses	no. species	8
Forbs	no. species	12
Large eucalypts	no. / ha	14
Large non-eucalypts	no. / ha	7
Tree canopy median height	m	23
Tree canopy cover	%	22
Native shrub cover	%	1
Native perennial grass cover	%	12
Organic litter cover	%	15
Coarse woody debris	m / ha	375

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	17
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	25
Litter cover	5	5	Site + Landscape	106	72
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	97

Habitat quality score:

6

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC02 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04375; 148.47647
50 m (centre point):	-22.04361; 148.47679
100 m (end point):	-22.04336; 148.47729
Elevation (mAHD):	205
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	12
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	5
Total large trees/ha:	34
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Alphitonia excelsa</i>	9
50 x 10 m area	
Shrub spp. richness: <i>Exocarpos latifolius</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Diospyros humilis</i> , <i>Atalaya hemiglauca</i> , <i>Dodonaea sp.</i> , <i>Grewia latifolia</i> , <i>Sida hackettiana</i>	10
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Themeda triandra</i> , <i>Aristida sp.</i> , <i>Heteropogon contortus</i> , <i>Oplismenus aemulus</i> , <i>Panicum effusum</i> , <i>Eulalia aurea</i>	7
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Ipomoea sp.</i> , <i>Desmodium macrocarpum</i> , <i>Achyranthes aspera</i> , <i>Commelina diffusa</i> , <i>Glycine tabacina</i> , <i>Rhynchosia minima</i>	8
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	3
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i> , <i>Tridax procumbens</i> , <i>Malvastrum americanum</i> , <i>Bothriochloa pertusa</i>	70

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	71			
Shrub canopy cover (100 m canopy intercept)	% cover	16.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	50			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	500			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	19
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	15	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	0	Total	50	38
Litter cover	5	3	Site + Landscape	106	79
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	117

Habitat quality score:

8

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC03 – Koala habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.03214; 148.46191
50 m (centre point):	-22.03231; 148.46239
100 m (end point):	-22.03252; 148.46280
Elevation (mAHD):	212
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	25
Total large trees/ha:	54
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Cassia brewsteri</i>	10
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>Flueggea leucopyrus</i> , <i>Grewia latifolia</i> , <i>Acalypha eremorum</i> , <i>Petalostigma pubescens</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Diospyros humilis</i> , <i>Bursaria incana</i> , <i>Acacia rhodoxylon</i>	19
Grass spp. richness: <i>Themeda avenacea</i> , <i>Themeda triandra</i> , <i>Arundinella nepalensis</i> , <i>Heteropogon contortus</i> , <i>Eragrostis sororia</i> , <i>Eragrostis elongata</i> , <i>Dinebra decipiens</i> , <i>Panicum sp.</i> , <i>Sporobolus creber</i>	9
Forb spp. richness: <i>Glycine tomentella</i> , <i>Phyllanthus virgatus</i> , <i>Pratia concolor</i> , <i>Ipomoea sp.</i>	4
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Solanum seaforthianum</i> , <i>Senna occidentalis</i> , <i>Opuntia tomentosa</i> , <i>Stylosanthes scabra</i> , <i>Melochia pyramidata</i>	20

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	40			
Shrub canopy cover (100 m canopy intercept)	% cover	20.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	13			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	177			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	19
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	15	Mobility	10	7
Fallen woody material	5	5	Site location	5	4
Weed cover	10	5	Total	50	38
Litter cover	5	5	Site + Landscape	106	90
Total	80	71	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	128

Habitat quality score:

8

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC01 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07656; 148.45959
50 m (centre point):	-22.07617; 148.45937
100 m (end point):	-22.07577; 148.45911
Elevation (mAHD):	204
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	4
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i>	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Microlaena stipoides</i>	2
Forb spp. richness: <i>Centipeda minima</i> , <i>Alternanthera nana</i> , <i>Phyllanthus virgatus</i>	3
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Heliotropium indicum</i> , <i>Eclipta prostrata</i> , <i>Passiflora foetida</i>	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	21.8			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	70			
Litter cover (1 m x 1 m plots)	% cover	29			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	395			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	na			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	63.5
Total	80	56.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC02 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.09204; 148.49074
50 m (centre point):	-22.09177; 148.49109
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	6
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	12
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i>	1
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i>	1
Forb spp. richness: <i>Marsilea sp.</i>	1
Other spp.:	-
Weed spp. and cover as % of area:	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	36.9			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	25			
Litter cover (1 m x 1 m plots)	% cover	75			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	2.5	Total:	26	5
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	0	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	54
Total	80	49	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	82

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC03 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07801; 148.46028
50 m (centre point):	-22.07781; 148.45988
100 m (end point):	-22.07753; 148.45952
Elevation (mAHD):	208
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum woodland on grassy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	14
Tree canopy (EDL) height (m):	17
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i> , <i>E. tereticornis</i> x <i>E. platyphylla</i> hybrid	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Dinebra decipiens</i> , <i>Eragrostis elongata</i>	3
Forb spp. richness: <i>Cyperus victoriensis</i> , <i>Phyllanthus virgatus</i> , <i>Centipeda minima</i> ,	3
Other spp.:	
Weed spp. and cover as % of area: <i>Sida spinescens</i> , <i>Heliotropium indicum</i> , <i>Passiflora foetida</i>	<1

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	34.6			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	44			
Litter cover (1 m x 1 m plots)	% cover	51			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	365			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	65.5
Total	80	58.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 4.9BC03 – OS habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 05/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.4.9/11.4.8 (70/30)	Observed RE: 11.4.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04496; 148.46529
50 m (centre point):	-22.04538; 148.46553
100 m (end point):	-22.04577; 148.46568
Elevation (mAHD):	215
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Belah with dense Yellowwood understory on clay plain
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	13
Total large trees/ha:	26
Tree canopy (EDL) height (m):	19
Sub-canopy height (m):	11
Emergent height (m):	NA
Total tree species richness: <i>Casuarina cristata</i> , <i>Terminalia oblongata</i> , <i>Eucalyptus cambageana</i> , <i>Acacia harpophylla</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Geijera parviflora</i> , <i>Alectryon diversifolius</i> , <i>Carissa ovata</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Enchylaena tomentosa</i> , <i>T. oblongata</i> , <i>Diospyros humilis</i> , <i>C. cristata</i> , <i>Alectryon oleifolius</i> , <i>Flindersia dissosperma</i> , <i>Citrus glauca</i> , <i>Cassia brewsteri</i> , <i>Ehretia membranifolia</i> , <i>Psyrax odorata</i> subsp. <i>buxifolia</i> , <i>Triflorensia ixoroides</i> , <i>Erythroxylum australe</i> , <i>Acacia</i> <i>oswaldii</i> , <i>A. harpophylla</i> , <i>Abutilon oxycarpum</i>	20
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Aristida jerichoensis</i> , <i>Paspalidium</i> sp., <i>Ancistrachne</i> <i>uncinulata</i> , <i>Enteropogon ramosus</i> , <i>Cymbopogon queenslandicus</i> , <i>Dichanthium sericeum</i> , <i>Sporobolus actinocladus</i> , <i>Eragrostis</i> sp.	9
Forb spp. richness: <i>Cyanthillium cinereus</i> , <i>Nyssanthes erecta</i>	2
Other spp.: <i>Marsdenia</i> sp., <i>Clematicissus opaca</i> , <i>Jacquemontia paniculata</i>	3
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i>	10

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	48.6			
Shrub canopy cover (100 m canopy intercept)	% cover	47.9			
Native perennial grass cover (1 m x 1 m plots)	% cover	3			
Litter cover (1 m x 1 m plots)	% cover	55			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	610			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	5			
Shrubs	no. species	10			
Grasses	no. species	5			
Forbs	no. species	10			
Large eucalypts	no. / ha	NA			
Large non-eucalypts	no. / ha	45			
Tree canopy median height	m	13			
Tree canopy cover	%	25			
Native shrub cover	%	5			
Native perennial grass cover	%	20			
Organic litter cover	%	45			
Coarse woody debris	m / ha	1200			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	13
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	21
Litter cover	5	5	BioCondition: Site + landscape	106	75
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	96

Habitat quality score:

6

Site photos



Start point, facing SSE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 4.9BC04 – endangered	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 05/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.4.9/11.4.8 (70/30)	Observed RE: 11.4.9
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04486; 148.4621
50 m (centre point):	-22.04445; 148.46205
100 m (end point):	-22.04401; 148.46205
Elevation (mAHD):	218
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Belah with Yellowwood understory on clay plain
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	15
Total large trees/ha:	30
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	10
Emergent height (m):	NA
Total tree species richness: <i>Casuarina cristata</i> , <i>Terminalia oblongata</i> , <i>Eucalyptus cambageana</i> , <i>Geijera parviflora</i> , <i>Flindersia dissosperma</i> , <i>Eremophila mitchellii</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Capparis lasiantha</i> , <i>Geijera parviflora</i> , <i>Alectryon diversifolius</i> , <i>Carissa ovata</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Enchylaena tomentosa</i> , <i>T. oblongata</i> , <i>E. mitchellii</i> , <i>Diospyros humilis</i> , <i>Grewia latifolia</i> , <i>C. cristata</i> , <i>Alectryon oleifolius</i> , <i>Pittosporum spinescens</i> , <i>Citrus glauca</i> , <i>Abutilon oxycarpum</i>	15
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Aristida jerichoensis</i> , <i>Paspalidium</i> sp., <i>Ancistrachne uncinulata</i> , <i>Enteropogon ramosus</i> , <i>Aristida queenslandicus</i> , <i>Eragrostis sororia</i> , <i>Enneapogon</i> sp., <i>Panicum effusum</i>	9
Forb spp. richness: <i>Cyperus gracilis</i>	1
Other spp.: <i>Cymbidium canaliculatum</i> , <i>Parsonsia</i> sp., <i>Secamone ellipticum</i> , <i>Jacquemontia paniculata</i>	4
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Opuntia tomentosa</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	43.8			
Shrub canopy cover (100 m canopy intercept)	% cover	47.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	12.			
Litter cover (1 m x 1 m plots)	% cover	37			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	345			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	5			
Shrubs	no. species	10			
Grasses	no. species	5			
Forbs	no. species	10			
Large eucalypts	no. / ha	NA			
Large non-eucalypts	no. / ha	45			
Tree canopy median height	m	13			
Tree canopy cover	%	25			
Native shrub cover	%	5			
Native perennial grass cover	%	20			
Organic litter cover	%	45			
Coarse woody debris	m / ha	1200			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	13
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	3	Quality of shelter	10	5
Large trees	15	10	Mobility	10	7
Fallen woody material	5	2	Site location	5	1
Weed cover	10	10	Total	50	21
Litter cover	5	5	Site + landscape	106	79
Total	80	66	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	100

Habitat quality score:

6

Site photos



Start point, facing N



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: OSBC01 – OS habitat	Assessor – Bruce McLennan
Property: Deverill	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.3.1 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.12360; 148.38094
50 m (centre point):	-22.12402; 148.38083
100 m (end point):	Not recorded
Elevation (mAHD):	189
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow regrowth on moderate gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	3
Sub-canopy height (m):	
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Lysiphyllum carronii</i>	2
50 x 10 m area	
Shrub spp. richness: <i>Terminalia oblongata</i> , <i>Apophyllum anomalum</i> , <i>Carissa ovata</i> , <i>Enchylaena tomentosa</i> , <i>Abutilon oxycarpum</i>	5
Grass spp. richness: <i>Sporobolus caroli</i> , <i>Bothriochloa</i> sp., <i>Dichanthium sericeum</i>	3
Forb spp. richness: <i>Alternanthera denticulata</i> , , <i>Sesbania cannabina</i> , <i>Rhynchosia minima</i> , <i>Sida rohlenae</i> , <i>Cyperus</i> sp., <i>Glycine</i> sp., <i>Ipomoea plebeia</i>	7
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Parthenium hysterophorus</i> , <i>Harrisia martinii</i> , <i>Malvastrum americanum</i> , <i>Stylosanthes scabra</i>	80

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	19.5			
Shrub canopy cover (100 m canopy intercept)	% cover	3.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	4			
Litter cover (1 m x 1 m plots)	% cover	6			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	50			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	5			
Grasses	no. species	4			
Forbs	no. species	8			
Large eucalypts	no. / ha	NA			
Large non-eucalypts	no. / ha	170			
Tree canopy median height	m	14			
Tree canopy cover	%	29			
Native shrub cover	%	8			
Native perennial grass cover	%	8			
Organic litter cover	%	34			
Coarse woody debris	m / ha	1752			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	3	Connectivity	5	2
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	12
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	0	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	0	Mobility	10	10
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + landscape	106	43
Total	80	31	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	84

Habitat quality score (percentage):

5

Site photos



Start point, facing SSW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: OSBC06 – OS habitat	Assessor – Bruce McLennan
Property: Deverill	Date: 01/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.09861; 148.38159
50 m (centre point):	-22.09867; 148.38203
100 m (end point):	-22.09877; 148.38254
Elevation (mAHD):	201
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow regrowth on moderate gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	5.5
Sub-canopy height (m):	
Emergent height (m):	NA
Total tree species richness:	3
<i>Acacia harpophylla</i> , <i>Atalaya hemiglauc</i> , <i>Eucalyptus cambageana</i>	
50 x 10 m area	
Shrub spp. richness:	5
<i>Capparis lasiantha</i> , <i>Apophyllum anomalum</i> , <i>Citrus glauca</i> , <i>Enchylaena tomentosa</i> , <i>Maireana microphylla</i>	
Grass spp. richness:	7
<i>Sporobolus caroli</i> , <i>Dinebra decipiens</i> , <i>Dichanthium sericeum</i> , <i>Digitaria</i> sp., <i>Eriochloa procera</i> , <i>Enteropogon ramosus</i> , <i>Eragrostis</i> sp.	
Forb spp. richness:	6
<i>Alternanthera denticulata</i> , <i>Cyperus bifax</i> , <i>Cyperus gracilis</i> , <i>Glycine</i> sp., <i>Ipomoea plebeia</i> , <i>Sida</i> sp.	
Other spp.:	1
<i>Clematicissus opaca</i>	
Weed spp. and cover as % of area:	65
<i>Cenchrus ciliaris</i> , <i>Portulaca oleracea</i> , <i>Harrisia martinii</i> , <i>Malvastrum americanum</i> , <i>Abutilon guineense</i> , <i>Urochloa mosambicensis</i>	

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	26			
Shrub canopy cover (100 m canopy intercept)	% cover	1.4			
Native perennial grass cover (1 m x 1 m plots)	% cover	3			
Litter cover (1 m x 1 m plots)	% cover	14			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	5			
Shrubs	no. species	10			
Grasses	no. species	5			
Forbs	no. species	10			
Large eucalypts	no. / ha	NA			
Large non-eucalypts	no. / ha	45			
Tree canopy median height	m	13			
Tree canopy cover	%	25			
Native shrub cover	%	5			
Native perennial grass cover	%	20			
Organic litter cover	%	45			
Coarse woody debris	m / ha	1200			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	3	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	10
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	31
Litter cover	5	0	Site + landscape	106	41
Total	80	31	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	72

Habitat quality score:

5

Site photos



Start point, facing E



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: OSBC07 – OS habitat	Assessor – Bruce McLennan
Property: Deverill	Date: 19/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: Regrowth 11.4.9 (non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.13950; 148.37534
50 m (centre point):	-22.13906; 148.37523
100 m (end point):	-22.13861; 148.37517
Elevation (mAHD):	188
General Site Description	
Landform	Gently undulating plain
Soil	Light clay
Dominant vegetation observed	Brigalow regrowth on shallow gilgai clay soils
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Eucalypt trees:	
Non-Eucalypt large tree DBH (cm): (from benchmark document)	28
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	2.5
Sub-canopy height (m):	
Emergent height (m):	NA
Total tree species richness: <i>Acacia harpophylla</i> , <i>Cassia brewsteri</i> , <i>Lysiphyllum carronii</i> , <i>Atalaya hemiglauc</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Apophyllum anomalum</i> , <i>Alectryon diversifolius</i> , <i>Citrus glauca</i> , <i>Maireana microphylla</i> , <i>Atalaya hemiglauc</i>	5
Grass spp. richness: <i>Leptochloa digitata</i> , <i>Sporobolus disjunctus</i> , <i>Dichanthium sericeum</i> , <i>Walwhalleya proluta</i> , <i>Sporobolus caroli</i> , <i>Digitaria sp.</i> , <i>Dinebra decipiens</i>	7
Forb spp. richness: <i>Alternanthera denticulata</i> , <i>Cyperus concinnus</i> , <i>Cyperus sp.</i> , <i>Balsamicum polystachion</i> , <i>Sesbania cannabina</i> , <i>Centipeda minima</i> , <i>Ammannia multiflora</i> , <i>Ipomoea plebeia</i> , <i>Sclerolaena tetracuspis</i> , <i>Glycine sp.</i> , <i>Otelia sp.</i>	11
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Opuntia tomentosa</i> , <i>Parthenium hysterophorus</i>	90

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	2			
Shrub canopy cover (100 m canopy intercept)	% cover	8.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	2			
Litter cover (1 m x 1 m plots)	% cover	9			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	70			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	5			
Shrubs	no. species	10			
Grasses	no. species	5			
Forbs	no. species	10			
Large eucalypts	no. / ha	NA			
Large non-eucalypts	no. / ha	45			
Tree canopy median height	m	13			
Tree canopy cover	%	25			
Native shrub cover	%	5			
Native perennial grass cover	%	20			
Organic litter cover	%	45			
Coarse woody debris	m / ha	1200			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	3	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	10
Tree canopy cover	5	0	Habitat:		
Tree canopy height	5	0	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	0	Mobility	10	10
Fallen woody material	5	0	Site location	5	4
Weed cover	10	0	Total	50	41
Litter cover	5	3	Site + landscape	106	40
Total	80	30	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	81

Habitat quality score (percentage):

5

Site photos



Start point, facing N



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.27BC01 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.27b	Observed RE: 11.3.27f
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.05169; 148.48329
50 m (centre point):	-22.05176; 148.48381
100 m (end point):	-22.05186; 148.48427
Elevation (mAHD):	208
General Site Description	
Landform	Closed depression
Soil	Light clay and alluvial sands
Dominant vegetation observed	Forest red gum on sedgy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	46
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	14
Tree canopy (EDL) height (m):	23
Sub-canopy height (m):	10
Emergent height (m):	NA
Total tree species richness:	1
<i>Eucalyptus tereticornis</i>	
50 x 10 m area	
Shrub spp. richness: <i>Ludwigia octovalvis</i>	1
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Diplachne fusca</i> var. <i>fusca</i>	2
Forb spp. richness: <i>Eleocharis</i> sp., <i>Eleocharis plana</i> , <i>Marsilea</i> sp., <i>Centipeda minima</i> , <i>Cucumis argenteus</i>	5
Other spp.:	-
Weed spp. and cover as % of area: <i>Eclipta prostrata</i> , <i>Passiflora foetida</i> , <i>Heliotropium indicum</i>	<5

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	35.7
Shrub canopy cover (100 m canopy intercept)	% cover	0
Native perennial grass cover (1 m x 1 m plots)	% cover	1.4
Litter cover (1 m x 1 m plots)	% cover	48.4
Coarse woody debris (from 50 m x 20 m plot)	m / ha	530
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	1
Shrubs	no. species	1
Grasses	no. species	3
Forbs	no. species	6
Large eucalypts	no. / ha	46
Large non-eucalypts	no. / ha	NA
Tree canopy median height	m	16
Tree canopy cover	%	40
Native shrub cover	%	NA
Native perennial grass cover	%	3
Organic litter cover	%	15
Coarse woody debris	m / ha	530

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	2
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	4
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	5	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	38
Litter cover	5	3	Site + landscape	106	64
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	102

Habitat quality score:

7

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC01 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07656; 148.45959
50 m (centre point):	-22.07617; 148.45937
100 m (end point):	-22.07577; 148.45911
Elevation (mAHD):	204
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	4
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i>	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Microlaena stipoides</i>	2
Forb spp. richness: <i>Centipeda minima</i> , <i>Alternanthera nana</i> , <i>Phyllanthus virgatus</i>	3
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Heliotropium indicum</i> , <i>Eclipta prostrata</i> , <i>Passiflora foetida</i>	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	21.8			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	70			
Litter cover (1 m x 1 m plots)	% cover	29			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	395			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	na			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	63.5
Total	80	56.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91.5

Habitat quality score:

6

Site photos



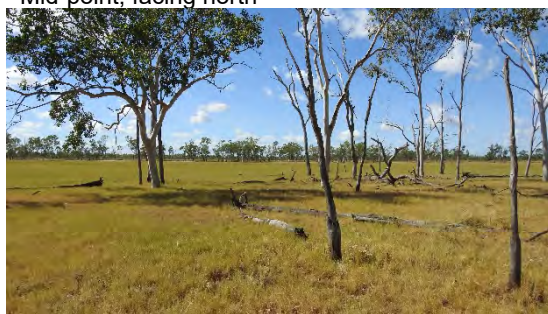
Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC02 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.09204; 148.49074
50 m (centre point):	-22.09177; 148.49109
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	6
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	12
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i>	1
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i>	1
Forb spp. richness: <i>Marsilea sp.</i>	1
Other spp.:	-
Weed spp. and cover as % of area:	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	36.9			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	25			
Litter cover (1 m x 1 m plots)	% cover	75			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	2.5	Total:	26	5
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	0	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	54
Total	80	49	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	82

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC03 – Painted Snipe habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07801; 148.46028
50 m (centre point):	-22.07781; 148.45988
100 m (end point):	-22.07753; 148.45952
Elevation (mAHD):	208
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum woodland on grassy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	14
Tree canopy (EDL) height (m):	17
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i> , <i>E. tereticornis</i> x <i>E. platyphylla</i> hybrid	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Dinebra decipiens</i> , <i>Eragrostis elongata</i>	3
Forb spp. richness: <i>Cyperus victoriensis</i> , <i>Phyllanthus virgatus</i> , <i>Centipeda minima</i> ,	3
Other spp.:	
Weed spp. and cover as % of area: <i>Sida spinescens</i> , <i>Heliotropium indicum</i> , <i>Passiflora foetida</i>	<1

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	34.6			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	44			
Litter cover (1 m x 1 m plots)	% cover	51			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	365			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	65.5
Total	80	58.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.2BC01 – Squatter pigeon habitat		Assessor – Bruce McLennan
Property: Twenty Mile		Date: 28/04/2018
Bioregion: Brigalow Belt		Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)		Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description		
0 m (start of transect):		-22.04382; 148.47989
50 m (centre point):		-22.04380; 148.47940
100 m (end point):		Not recorded
Elevation (mAHD):		208
General Site Description		
Landform		Gently undulating plain
Soil		Sandy loam
Dominant vegetation observed		Poplar box woodland with shrubby understory on alluvial clay loam
100 x 50 m area (0.5 ha)		
Dominant canopy or EDL species with evidence of recruitment (%):		100
Eucalypt large tree DBH (cm): (from benchmark document)		40
Number of large Eucalypt trees:		7
Non-Eucalypt large tree DBH (cm): (from benchmark document)		na
Number of large Non-Eucalypt trees:		
Total large trees/ha:		14
Tree canopy (EDL) height (m):		18
Sub-canopy height (m):		7
Emergent height (m):		NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>E. crebra</i> , <i>Owenia acidula</i> , <i>Eremophila mitchellii</i> , <i>Alectryon oleifolius</i> , <i>Flindersia australis</i> , <i>F. dissosperma</i> , <i>Acacia excelsa</i> , <i>E. populnea</i> x <i>E. crebra</i> .		8
50 x 10 m area		
Shrub spp. richness: <i>Grewia latifolia</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Geijera parviflora</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Capparis loranthifolia</i> , <i>Acacia excelsa</i> , <i>Alectryon oleifolius</i> , <i>Denhamia cunninghamii</i> , <i>Acacia oswaldii</i> , <i>Eremophila debile</i>		13
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>Enneapogon</i> sp., <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>Aristida</i> sp., <i>Oplismenus</i> sp.		9
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Calotis cuneifolia</i> , <i>Hibiscus sturtii</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Cyperus gracilis</i> , <i>Desmodium macrocarpum</i>		8
Other spp.: <i>Lomandra multiflora</i> , <i>Parsonsia lanceolata</i> , <i>Jacquemontia paniculata</i> , <i>Eustrephus latifolius</i>		5
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i>		10

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	45.8			
Shrub canopy cover (100 m canopy intercept)	% cover	14			
Native perennial grass cover (1 m x 1 m plots)	% cover	10			
Litter cover (1 m x 1 m plots)	% cover	38			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	na			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	1	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	46
Litter cover	5	5	Site + landscape	106	73
Total	80	62	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	119

Habitat quality score:

8

Site photos



Start point, facing W



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.2BC02 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (65/30/5)	Observed RE: 11.3.2
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06423; 148.46820
50 m (centre point):	-22.06446; 148.46785
100 m (end point):	-22.06468; 148.46751
Elevation (mAHD):	197
General Site Description	
Landform	Gently undulating plain
Soil	Sandy loam
Dominant vegetation observed	Poplar box woodland on alluvial clay loam
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	40
Number of large Eucalypt trees:	9
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	
Total large trees/ha:	18
Tree canopy (EDL) height (m):	18.5
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>C. tessellaris</i> , <i>Vachellia bidwillii</i> , <i>Alphitonia excelsa</i> , <i>Atalaya hemiglauca</i>	6
50 x 10 m area	
Shrub spp. richness: <i>Grewia latifolia</i> , <i>G. retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Atalaya hemiglauca</i> , <i>Acacia excelsa</i> , <i>Abutilon oxycarpum</i> , <i>Eremophila debile</i>	12
Grass spp. richness: <i>Eragrostis sororia</i> , <i>Enteropogon ramosus</i> , <i>Panicum effusum</i> , <i>Bothriochloa bladhii</i> , <i>B. decipiens</i> , <i>Heteropogon contortus</i> , <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> , <i>Aristida calycina</i> , <i>A. jerichoensis</i> , <i>Enneapogon avenaceus</i> , <i>Enneapogon sp.</i> , <i>Alloteropsis semialata</i> , <i>Eulalia aurea</i>	14
Forb spp. richness: <i>Pterocaulon redolens</i> , <i>Waltheria indica</i> , <i>Apowollastonia spilanthisoides</i> , <i>Commelina diffusa</i> , <i>Hibiscus sp.</i> , <i>Zornia sp.</i> , <i>Melhania oblongifolia</i> , <i>Phyllanthus virgatus</i> , <i>Achyranthes aspera</i> , <i>Rostellularia adscendens</i> , <i>Calotis cuneifolia</i> , <i>Cyanthillium cinereum</i> , <i>Glycine tomentella</i> , <i>Glycine sp.</i> , <i>Alternanthera denticulata</i> , <i>Cyperus gracilis</i> , <i>Crinum flaccidum</i> , <i>Cyperus sp.</i>	18
Other spp.: <i>Lomandra longifolia</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Gomphrena celosioides</i>	5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	48.1			
Shrub canopy cover (100 m canopy intercept)	% cover	9.6			
Native perennial grass cover (1 m x 1 m plots)	% cover	22			
Litter cover (1 m x 1 m plots)	% cover	61			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	370			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	2			
Shrubs	no. species	2			
Grasses	no. species	9			
Forbs	no. species	17			
Large eucalypts	no. / ha	22			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	40			
Native shrub cover	%	2			
Native perennial grass cover	%	35			
Organic litter cover	%	30			
Coarse woody debris	m / ha	307			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	11
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	10
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	46
Litter cover	5	3	Site + landscape	106	82
Total	80	71	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	128

Habitat quality score:

8

Site photos



Start point, facing SW



Mid-point, facing north



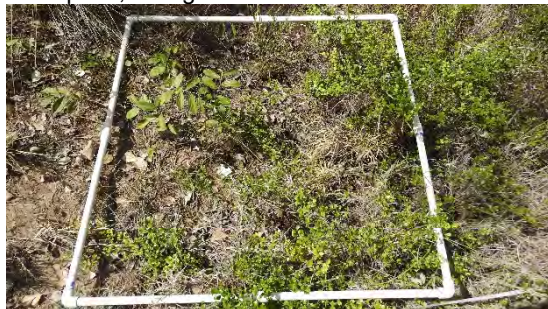
Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC01 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.05728; 148.49925
50 m (centre point):	-22.05704; 148.49968
100 m (end point):	Not recorded
Elevation (mAHD):	193
General Site Description	
Landform	Stream channel and banks
Soil	Sand
Dominant vegetation observed	Forest red gum with shrubby understory on alluvial terraces
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	1
Total large trees/ha:	16
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>Corymbia tessellaris</i> , <i>Erythrina vespertilio</i> , <i>Cassia brewsteri</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Capparis loranthifolia</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Jasminum didymum</i> subsp. <i>lineare</i> , <i>Grewia latifolia</i> , <i>Grewia retusifolia</i> , <i>Ficus opposita</i> , <i>Acacia salicina</i> , <i>Petalostigma pubescens</i> , <i>Sida hackettiana</i>	12
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Bothriochloa bladhii</i> , <i>Aristida</i> sp., <i>Heteropogon contortus</i> , <i>Bothriochloa ewartiana</i>	5
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Commelina diffusa</i> , <i>Waltheria indica</i> , <i>Crotalaria</i> sp., <i>Crinum flaccidum</i>	6
Other spp.: <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Sida rhombifolia</i> , <i>Urochloa mosambicensis</i> , <i>Stylosanthes scabra</i>	80

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	18			
Shrub canopy cover (100 m canopy intercept)	% cover	3.1			
Native perennial grass cover (1 m x 1 m plots)	% cover	2			
Litter cover (1 m x 1 m plots)	% cover	11			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	445			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	17
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	10	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	32
Litter cover	5	5	Site + Landscape	106	72
Total	80	55	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	104

Habitat quality score:

7

Site photos



Start point, facing SW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC02 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 28/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.04375; 148.47647
50 m (centre point):	-22.04361; 148.47679
100 m (end point):	-22.04336; 148.47729
Elevation (mAHD):	205
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	12
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	5
Total large trees/ha:	34
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	8
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Alphitonia excelsa</i>	9
50 x 10 m area	
Shrub spp. richness: <i>Exocarpos latifolius</i> , <i>Flueggea leucopyrus</i> , <i>Lysicarpus hookeri</i> , <i>Carissa ovata</i> , <i>Cassia brewsteri</i> , <i>Diospyros humilis</i> , <i>Atalaya hemiglauca</i> , <i>Dodonaea sp.</i> , <i>Grewia latifolia</i> , <i>Sida hackettiana</i>	10
Grass spp. richness: <i>Enteropogon ramosus</i> , <i>Themeda triandra</i> , <i>Aristida sp.</i> , <i>Heteropogon contortus</i> , <i>Oplismenus aemulus</i> , <i>Panicum effusum</i> , <i>Eulalia aurea</i>	7
Forb spp. richness: <i>Glycine tomentella</i> , <i>Cyperus gracilis</i> , <i>Ipomoea sp.</i> , <i>Desmodium macrocarpum</i> , <i>Achyranthes aspera</i> , <i>Commelina diffusa</i> , <i>Glycine tabacina</i> , <i>Rhynchosia minima</i>	8
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i> , <i>Parsonsia lanceolata</i>	3
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Emilia sonchifolia</i> , <i>Sida rhombifolia</i> , <i>Tridax procumbens</i> , <i>Malvastrum americanum</i> , <i>Bothriochloa pertusa</i>	70

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	71			
Shrub canopy cover (100 m canopy intercept)	% cover	16.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	50			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	500			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	19
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	10
Large trees	15	15	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	33
Litter cover	5	3	Site + Landscape	106	79
Total	80	60	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	112

Habitat quality score:

7

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 3.25BC03 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: 11.3.2/11.3.25/11.3.1 (50/25/25)	Observed RE: 11.3.25
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.03214; 148.46191
50 m (centre point):	-22.03231; 148.46239
100 m (end point):	-22.03252; 148.46280
Elevation (mAHD):	212
General Site Description	
Landform	Stream channel
Soil	Sand
Dominant vegetation observed	Forest red gum and River tea tree on a watercourse
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	49
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	29
Number of large Non-Eucalypt trees:	25
Total large trees/ha:	54
Tree canopy (EDL) height (m):	22
Sub-canopy height (m):	9
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>E. crebra</i> , <i>E. populnea</i> , <i>Melaleuca fluviatilis</i> , <i>Corymbia tessellaris</i> , <i>C. clarksoniana</i> , <i>Acacia salicina</i> , <i>Ficus opposita</i> , <i>Lysiphyllum hookeri</i> , <i>Cassia brewsteri</i>	10
50 x 10 m area	
Shrub spp. richness: <i>Acacia salicina</i> , <i>Flueggea leucopyrus</i> , <i>Grewia latifolia</i> , <i>Acalypha eremorum</i> , <i>Petalostigma pubescens</i> , <i>Carissa ovata</i> , <i>Erythroxylum australe</i> , <i>Diospyros humilis</i> , <i>Bursaria incana</i> , <i>Acacia rhodoxylon</i>	19
Grass spp. richness: <i>Themeda avenacea</i> , <i>Themeda triandra</i> , <i>Arundinella nepalensis</i> , <i>Heteropogon contortus</i> , <i>Eragrostis sororia</i> , <i>Eragrostis elongata</i> , <i>Dinebra decipiens</i> , <i>Panicum sp.</i> , <i>Sporobolus creber</i>	9
Forb spp. richness: <i>Glycine tomentella</i> , <i>Phyllanthus virgatus</i> , <i>Pratia concolor</i> , <i>Ipomoea sp.</i>	4
Other spp.: <i>Lomandra longifolia</i> , <i>Eustrephus latifolius</i>	2
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> , <i>Megathyrsus maximus</i> , <i>Sida cordifolia</i> , <i>Lantana camara</i> , <i>Melinis repens</i> , <i>Sida rhombifolia</i> , <i>Scoparia dulcis</i> , <i>Solanum seafortianum</i> , <i>Senna occidentalis</i> , <i>Opuntia tomentosa</i> , <i>Stylosanthes scabra</i> , <i>Melochia pyramidata</i>	20

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	40			
Shrub canopy cover (100 m canopy intercept)	% cover	20.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	16			
Litter cover (1 m x 1 m plots)	% cover	13			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	177			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	4			
Shrubs	no. species	2			
Grasses	no. species	8			
Forbs	no. species	12			
Large eucalypts	no. / ha	14			
Large non-eucalypts	no. / ha	7			
Tree canopy median height	m	23			
Tree canopy cover	%	22			
Native shrub cover	%	1			
Native perennial grass cover	%	12			
Organic litter cover	%	15			
Coarse woody debris	m / ha	375			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	5	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	5
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	19
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	3	Quality of foraging	10	1
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	15	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	5	Total	50	24
Litter cover	5	5	Site + Landscape	106	90
Total	80	71	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	114

Habitat quality score:

7

Site photos



Start point, facing ESE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC01 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07656; 148.45959
50 m (centre point):	-22.07617; 148.45937
100 m (end point):	-22.07577; 148.45911
Elevation (mAHD):	204
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	2
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	4
Tree canopy (EDL) height (m):	15
Sub-canopy height (m):	7
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i>	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Microlaena stipoides</i>	2
Forb spp. richness: <i>Centipeda minima</i> , <i>Alternanthera nana</i> , <i>Phyllanthus virgatus</i>	3
Other spp.: <i>Cymbidium canaliculatum</i>	1
Weed spp. and cover as % of area: <i>Heliotropium indicum</i> , <i>Eclipta prostrata</i> , <i>Passiflora foetida</i>	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	21.8			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	70			
Litter cover (1 m x 1 m plots)	% cover	29			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	395			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	na			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	63.5
Total	80	56.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC02 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.09204; 148.49074
50 m (centre point):	-22.09177; 148.49109
100 m (end point):	Not recorded
Elevation (mAHD):	200
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum fringed grassy swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	6
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	12
Tree canopy (EDL) height (m):	18
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i>	1
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i>	1
Forb spp. richness: <i>Marsilea sp.</i>	1
Other spp.:	-
Weed spp. and cover as % of area:	<5

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	36.9			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	25			
Litter cover (1 m x 1 m plots)	% cover	75			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	0			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	2.5	Total:	26	5
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	0	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	3	Site + landscape	106	54
Total	80	49	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	82

Habitat quality score:

5

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: 5.17BC03 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.17
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07801; 148.46028
50 m (centre point):	-22.07781; 148.45988
100 m (end point):	-22.07753; 148.45952
Elevation (mAHD):	208
General Site Description	
Landform	Closed depression
Soil	Light clay
Dominant vegetation observed	Forest red gum and Poplar gum woodland on grassy ephemeral swamps
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	7
Non-Eucalypt large tree DBH (cm): (from benchmark document)	NA
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	14
Tree canopy (EDL) height (m):	17
Sub-canopy height (m):	9
Emergent height (m):	na
Total tree species richness: <i>Eucalyptus tereticornis</i> , <i>Eucalyptus platyphylla</i> , <i>E. tereticornis</i> x <i>E. platyphylla</i> hybrid	2
50 x 10 m area	
Shrub spp. richness:	
Grass spp. richness: <i>Brachyachne convergens</i> , <i>Dinebra decipiens</i> , <i>Eragrostis elongata</i>	3
Forb spp. richness: <i>Cyperus victoriensis</i> , <i>Phyllanthus virgatus</i> , <i>Centipeda minima</i> ,	3
Other spp.:	
Weed spp. and cover as % of area: <i>Sida spinescens</i> , <i>Heliotropium indicum</i> , <i>Passiflora foetida</i>	<1

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	34.6			
Shrub canopy cover (100 m canopy intercept)	% cover	0			
Native perennial grass cover (1 m x 1 m plots)	% cover	44			
Litter cover (1 m x 1 m plots)	% cover	51			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	365			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	3			
Shrubs	no. species	1			
Grasses	no. species	3			
Forbs	no. species	7			
Large eucalypts	no. / ha	29			
Large non-eucalypts	no. / ha	NA			
Tree canopy median height	m	18			
Tree canopy cover	%	41			
Native shrub cover	%	3			
Native perennial grass cover	%	20			
Organic litter cover	%	31			
Coarse woody debris	m / ha	330			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	5
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	2.5	Connectivity	5	0
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	7
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	5	Threats	15	7
Shrub layer cover	5	0	Quality of foraging	10	5
Native perennial grass cover	5	5	Quality of shelter	10	5
Large trees	15	5	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	10	Total	50	28
Litter cover	5	5	Site + landscape	106	65.5
Total	80	58.5	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	93.5

Habitat quality score:

6

Site photos



Start point, facing NW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC01 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06212; 148.46582
50 m (centre point):	-22.06168; 148.46599
100 m (end point):	-22.06133; 148.46613
Elevation (mAHD):	201
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	8
Sub-canopy height (m):	-
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Ventilago viminalis</i> , <i>Eucalyptus tereticornis</i> , <i>Acacia salicina</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Ventilago viminalis</i> , <i>Acacia excelsa</i> , <i>Cassia brewsteri</i> , <i>Carissa ovata</i> , <i>Acacia oswaldii</i> , <i>Atalaya hemiglauca</i> , <i>Capparis lasiantha</i> , <i>Ehretia membranifolia</i> , <i>Diospyros humilis</i> , <i>Capparis loranthifolia</i> , <i>Psydrax oleifolius</i>	11
Grass spp. richness: <i>Aristida calycina</i> , <i>Enteropogon ramosus</i> , <i>Aristida jerichoensis</i> , <i>Eragrostis brownii</i> , <i>Eragrostis sororia</i> , <i>Chrysopogon fallax</i>	6
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Evolvulus alsinoides</i> , <i>Alternanthera sp.</i> , <i>Galactia tenuifolia</i> , <i>Cyperus gracilis</i> , <i>Fimbristylis dichotoma</i>	6
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Urochloa mosambicensis</i> , <i>Sida spinescens</i> , <i>Stylosanthes scabra</i> , <i>Sida cordifolia</i> , <i>Malvastrum americanum</i>	80

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	21.9			
Shrub canopy cover (100 m canopy intercept)	% cover	8.2			
Native perennial grass cover (1 m x 1 m plots)	% cover	4			
Litter cover (1 m x 1 m plots)	% cover	37			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	360			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	18
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	36
Litter cover	5	5	Site + landscape	106	61
Total	80	43	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	97

Habitat quality score:

6

Site photos



Start point, facing NNE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



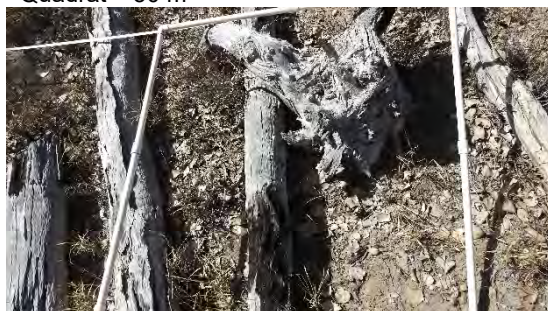
Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC03 – squatter pigeon	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 29/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06037; 148.47212
50 m (centre point):	-22.06082; 148.47223
100 m (end point):	-22.06123; 148.47238
Elevation (mAHD):	196
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	7
Sub-canopy height (m):	4
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>Acacia salicina</i> , <i>Vachellia bidwillii</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Ventilago viminalis</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> , <i>Vachellia bidwillii</i> , <i>Petalostigma pubescens</i> , <i>Myoporum acuminatum</i> , <i>Denhamia cunninghamii</i>	7
Grass spp. richness: <i>Aristida calycina</i> , <i>Heteropogon contortus</i> , <i>Aristida jerichoensis</i> , <i>Eragrostis sororia</i> , <i>Eragrostis brownii</i> , <i>Panicum effusum</i>	6
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Evolvulus alsinoides</i> , <i>Polygala sp.</i>	3
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> dominates, <i>Urochloa mosambicensis</i> , <i>Sida spinescens</i> , <i>Stylosanthes scabra</i> , <i>Sida cordifolia</i>	60

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	25.3			
Shrub canopy cover (100 m canopy intercept)	% cover	1.1			
Native perennial grass cover (1 m x 1 m plots)	% cover	1.4			
Litter cover (1 m x 1 m plots)	% cover	15			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	270			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	4
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	18
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	36
Litter cover	5	5	Site + landscape	106	60
Total	80	42	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	96

Habitat quality score:

6

Site photos



Start point, facing SSE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC05 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 30/04/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06441; 148.48267
50 m (centre point):	-22.06418; 148.48227
100 m (end point):	-22.06395; 148.48183
Elevation (mAHD):	196
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sand plains
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	8
Sub-canopy height (m):	-
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Atalaya hemiglauca</i> , <i>Acacia salicina</i> ,	3
50 x 10 m area	
Shrub spp. richness: <i>Carissa ovata</i> , <i>Atalaya hemiglauca</i> , <i>Ventilago viminalis</i> , <i>Capparis umbonata</i> , <i>Alectryon oleifolius</i> , <i>Cassia brewsteri</i> , <i>Acacia salicina</i> , <i>Eremophila mitchellii</i> , <i>Flindersia dissosperma</i> , <i>Ehretia membranifolia</i> , <i>Acacia oswaldii</i> , <i>Grevillea striata</i> , <i>Denhamia cunninghamii</i>	13
Grass spp. richness: <i>Aristida calycina</i> , <i>Bothriochloa bladhii</i> , <i>Eragrostis sp.</i> , <i>Enteropogon ramosus</i> , <i>Chrysopogon fallax</i> , <i>Panicum effusum</i>	6
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Cyperus sp.</i> , <i>Glycine sp.</i> , <i>Melhania oblongifolia</i> , <i>Nyssanthus erecta</i> , <i>Fimbristylis dichotoma</i> , <i>Alternanthera denticulata</i> , <i>Uident</i> , <i>Rhynchosia minima</i>	9
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Bothriochloa pertusa</i> , <i>Stylosanthes scabra</i>	70

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	10.2			
Shrub canopy cover (100 m canopy intercept)	% cover	6.5			
Native perennial grass cover (1 m x 1 m plots)	% cover	0			
Litter cover (1 m x 1 m plots)	% cover	16			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	305			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	5	Total:	26	16
Tree canopy cover	5	3	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	36
Litter cover	5	5	Site + landscape	106	58
Total	80	42	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	94

Habitat quality score:

6

Site photos



Start point, facing SE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC06 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 21/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.05447; 148.48108
50 m (centre point):	-22.05491; 148.481
100 m (end point):	-22.05537; 148.48093
Elevation (mAHD):	207
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sandy light clay
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	9
Sub-canopy height (m):	5
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>E. cambageana</i>	2
50 x 10 m area	
Shrub spp. richness: <i>Carissa ovata</i> , <i>Ventilago viminalis</i> , <i>Cassia brewsteri</i> , <i>Acacia excelsa</i> , <i>Eremophila mitchellii</i> , <i>Acacia oswaldii</i> , <i>Denhamia cunninghamii</i> , <i>Capparis lasiantha</i> , <i>Psydrax oleifolius</i>	9
Grass spp. richness: <i>Aristida calycina</i> , <i>A. jerichoensis</i> , <i>A. personata</i> , <i>Chrysopogon fallax</i>	4
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Sida rohlenae</i> , <i>Melhania oblongifolia</i> , <i>Evolvulus alsinoides</i> , <i>Waltheria indica</i> , <i>Pterocaulon redolens</i>	6
Other spp.:	0
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Bothriochloa pertusa</i> , <i>Opuntia tomentosa</i>	50

Plot attributes (actual)	Unit of measure	Measurement
Tree canopy cover (100 m canopy intercept)	% cover	9.1
Shrub canopy cover (100 m canopy intercept)	% cover	1.9
Native perennial grass cover (1 m x 1 m plots)	% cover	0
Litter cover (1 m x 1 m plots)	% cover	24
Coarse woody debris (from 50 m x 20 m plot)	m / ha	250
Benchmark attributes (source DNRME)	Unit of measure	Measurement
Recruitment of woody perennial species in EDL	%	100
Native plant species richness		
Trees	no. species	6
Shrubs	no. species	6
Grasses	no. species	6
Forbs	no. species	10
Large eucalypts	no. / ha	9
Large non-eucalypts	no. / ha	1
Tree canopy median height	m	16
Tree canopy cover	%	20
Native shrub cover	%	3
Native perennial grass cover	%	19
Organic litter cover	%	20
Coarse woody debris	m / ha	314

Site assessment scoring sheet

Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	4
Native plant species richness: Grasses	5	3	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	16
Tree canopy cover	5	2	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	0	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	36
Litter cover	5	5	Site + landscape	106	55
Total	80	39	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	91

Habitat quality score:

6

Site photos



Start point, facing SSW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC07 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 21/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.06027; 148.47829
50 m (centre point):	-22.06006; 148.47871
100 m (end point):	-22.05988; 148.47914
Elevation (mAHD):	205
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sandy light clay
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	9
Sub-canopy height (m):	5
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>E. cambageana</i> , <i>Acacia salicina</i> , <i>Corymbia clarksoniana</i>	4
50 x 10 m area	
Shrub spp. richness: <i>Archidendropsis basaltica</i> , <i>Cassia brewsteri</i> , <i>Owenia acidula</i> , <i>Grewia latifolia</i> , <i>Melaleuca nervosa</i>	5
Grass spp. richness: <i>Aristida calycina</i> , <i>A. jerichoensis</i> , <i>Eragrostis sororia</i> , <i>Chrysopogon fallax</i> , <i>Eragrostis sp.</i> , <i>Heteropogon contortus</i> , <i>Bothriochloa bladhii</i>	7
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Calotis cuneifolia</i> , <i>Evolvulus alsinoides</i> , <i>Waltheria indica</i>	4
Other spp.:	
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Urochloa mosambicensis</i> , <i>Malvastrum americanum</i> , <i>Stylosanthes scabra</i> , <i>Sida spinescens</i> , <i>Scoparia dulcis</i> , <i>Harrisia martinii</i>	35

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	17.4			
Shrub canopy cover (100 m canopy intercept)	% cover	1.4			
Native perennial grass cover (1 m x 1 m plots)	% cover	3.8			
Litter cover (1 m x 1 m plots)	% cover	42			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	465			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	3	Connectivity	5	4
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	16
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	36
Litter cover	5	3	Site + landscape	106	58
Total	80	42	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	94

Habitat quality score:

6

Site photos



Start point, facing NE



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC08 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 21/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07139; 148.46609
50 m (centre point):	-22.07178; 148.46594
100 m (end point):	-22.07220; 148.46577
Elevation (mAHD):	209
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sandy light clay
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	7
Sub-canopy height (m):	-
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Acacia excelsa</i> , <i>Corymbia clarksoniana</i>	3
50 x 10 m area	
Shrub spp. richness: <i>Archidendropsis basaltica</i> , <i>Cassia brewsteri</i> , <i>Vachellia bidwillii</i> , <i>Grewia retusifolia</i> , <i>Atalaya hemiglaucula</i> , <i>Acacia salicina</i> , <i>Ventilago viminalis</i> , <i>Acacia excelsa</i> , <i>Capparis lasiantha</i>	9
Grass spp. richness: <i>Aristida calycina</i> , <i>Panicum effusum</i> , <i>Eragrostis sororia</i> , <i>Chrysopogon fallax</i> , <i>Heteropogon contortus</i> , <i>Bothriochloa bladhii</i>	6
Forb spp. richness: <i>Phyllanthus virgatus</i> , <i>Fimbristylis dichotoma</i> , <i>Nyssanthus erecta</i> , <i>Waltheria indica</i>	4
Other spp.: <i>Parsonsia lanceolata</i>	1
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i>	30

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	15.5			
Shrub canopy cover (100 m canopy intercept)	% cover	4			
Native perennial grass cover (1 m x 1 m plots)	% cover	6			
Litter cover (1 m x 1 m plots)	% cover	42			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	625			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	2
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	14
Tree canopy cover	5	5	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	5	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	3	Total	50	36
Litter cover	5	5	Site + landscape	106	62
Total	80	48	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	98

Habitat quality score:

6

Site photos



Start point, facing SSW



Mid-point, facing north



Mid-point, facing south



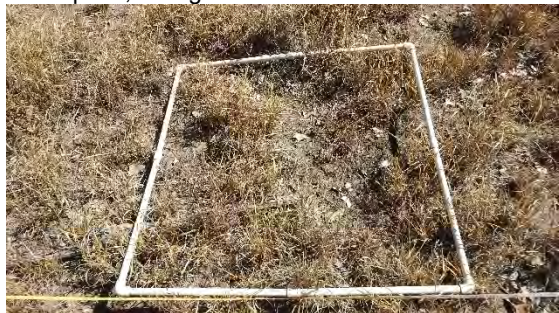
Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m

Site: ConBC09 – Squatter pigeon habitat	Assessor – Bruce McLennan
Property: Twenty Mile	Date: 21/05/2018
Bioregion: Brigalow Belt	Sub-region: Isaac – Comet Downs
State mapped RE: Non-remnant	Observed RE: 11.5.3 regrowth (Non-remnant)
Transect Co-ordinates (Datum) General Site Description	
0 m (start of transect):	-22.07333; 148.45364
50 m (centre point):	-22.07287; 148.45351
100 m (end point):	-22.07251; 148.45338
Elevation (mAHD):	206
General Site Description	
Landform	Gently undulating plain
Soil	Sandy light clay
Dominant vegetation observed	Poplar box regrowth on sandy light clay
100 x 50 m area (0.5 ha)	
Dominant canopy or EDL species with evidence of recruitment (%):	100
Eucalypt large tree DBH (cm): (from benchmark document)	44
Number of large Eucalypt trees:	0
Non-Eucalypt large tree DBH (cm): (from benchmark document)	34
Number of large Non-Eucalypt trees:	0
Total large trees/ha:	0
Tree canopy (EDL) height (m):	6.5
Sub-canopy height (m):	-
Emergent height (m):	NA
Total tree species richness: <i>Eucalyptus populnea</i> , <i>Acacia excelsa</i> , <i>Corymbia clarksoniana</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i>	5
50 x 10 m area	
Shrub spp. richness: <i>Archidendropsis basaltica</i> , <i>Cassia brewsteri</i> , <i>Atalaya hemiglauca</i> , <i>Carissa ovata</i> , <i>Petalostigma pubescens</i> , <i>Ventilago viminalis</i> , <i>Acacia excelsa</i> , <i>Capparis lasiantha</i>	8
Grass spp. richness: <i>Aristida calycina</i> , <i>Panicum effusum</i> , <i>Eragrostis sororia</i> , <i>Chrysopogon fallax</i> , <i>Heteropogon contortus</i> , <i>Bothriochloa sp.</i> , <i>Enteropogon acicularis</i> , <i>Enneapogon avenaceus</i>	8
Forb spp. richness: <i>Alternanthera sp.</i> , <i>Phyllanthus virgatus</i> , <i>Fimbristylis dichotoma</i> , <i>Sida sp.</i>	4
Other spp.:	-
Weed spp. and cover as % of area: <i>Cenchrus ciliaris</i> , <i>Stylosanthes scabra</i> , <i>Urochloa mosambicensis</i> , <i>Sida spinescens</i> , <i>Bothriochloa pertusa</i>	50

Plot attributes (actual)	Unit of measure	Measurement			
Tree canopy cover (100 m canopy intercept)	% cover	1.5			
Shrub canopy cover (100 m canopy intercept)	% cover	13.3			
Native perennial grass cover (1 m x 1 m plots)	% cover	8			
Litter cover (1 m x 1 m plots)	% cover	29			
Coarse woody debris (from 50 m x 20 m plot)	m / ha	800			
Benchmark attributes (source DNRME)	Unit of measure	Measurement			
Recruitment of woody perennial species in EDL	%	100			
Native plant species richness					
Trees	no. species	6			
Shrubs	no. species	6			
Grasses	no. species	6			
Forbs	no. species	10			
Large eucalypts	no. / ha	9			
Large non-eucalypts	no. / ha	1			
Tree canopy median height	m	16			
Tree canopy cover	%	20			
Native shrub cover	%	3			
Native perennial grass cover	%	19			
Organic litter cover	%	20			
Coarse woody debris	m / ha	314			
Site assessment scoring sheet					
Scoring sheet					
Attribute	Wooded ecosystem Weighting	Offset Score	Attribute	Wooded ecosystem Weighting	Offset Score
Site - based			Landscape scale		
Recruitment of woody perennial species	5	5	Size of patch	10	10
Native plant species richness: Trees	5	3	Context	5	0
Native plant species richness: Shrubs	5	5	Connectivity	5	2
Native plant species richness: Grasses	5	5	Proximity to Ecological Corridors	6	0
Native plant species richness: Forbs	5	3	Total:	26	12
Tree canopy cover	5	0	Habitat:		
Tree canopy height	5	3	Threats	15	15
Shrub layer cover	5	3	Quality of foraging	10	5
Native perennial grass cover	5	1	Quality of shelter	10	5
Large trees	15	0	Mobility	10	10
Fallen woody material	5	5	Site location	5	1
Weed cover	10	0	Total	50	36
Litter cover	5	5	Site + landscape	106	50
Total	80	38	TOTAL SCORE (Site + landscape + habitat (where relevant))	156	86

Habitat quality score:

6

Site photos



Start point, facing NNW



Mid-point, facing north



Mid-point, facing south



Mid-point, facing east



Mid-point, facing west



Quadrat – 30 m



Quadrat – 40 m



Quadrat – 50 m



Quadrat – 60 m



Quadrat – 70 m