Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10504/1
Permit type:	Area permit
Applicant name:	Arc Infrastructure
Application received:	1 February 2024
Application area:	0.008 hectares of native vegetation
Purpose of clearing:	Railway infrastructure maintenance
Method of clearing:	Mechanical clearing
Property:	Lot 89 on Plan 1961, Davenport and Glen Iris
Location (LGA area/s):	City of Bunbury
Localities (suburb/s):	Davenport and Glen Iris

1.2. Description of clearing activities

The vegetation proposed to be cleared is distributed across three separate areas (see Figure 1, Section 1.5) comprising of six native trees, including five *Eucalyptus rudis* (flooded gum) and one *Melaleuca rhaphiophylla* (swamp paperbark), and the associated understorey. The area proposed to be cleared equates to 0.008 hectares along the bank of a natural perennial lake and existing railway line.

The proposed clearing is required to undertake the removal and replacement of the existing railway bridge deck, to maintain the functioning and safety of the rail line. Clearing of the area of adjacent vegetation is required to provide space for materials laydown and allow access for machinery (crane) to complete the works (Arc Infrastructure, 2024a).

1.3. Decision on application

Decision:	Granted
Decision date:	4 June 2024
Decision area:	0.008 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1.), the findings of a flora, fauna and vegetation survey (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that these works are necessary to maintain the functioning and safety of the rail line.

The assessment identified that the proposed clearing will result in:

- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the proposed clearing is unlikely to lead to appreciable land degradation, have long-term adverse impacts on environmental values and can be minimised and managed to unlikely lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- revegetation of areas temporarily cleared; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

1.5. Site map

Figure 1: Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Soil and Land Conservation Act 1945* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The mitigation of environmental impacts was considered by Arc Infrastructure through selecting a highly disturbed area that shows evidence of historical clearing as the location for the proposed clearing area. Due to the selection of this location, the clearing will predominantly consist of non-native vegetation and no large, mature trees (Arc Infrastructure, 2024a).

Clearing of native vegetation has been avoided and minimised as much as practicable during the planning phase. Mature trees and potential habitat trees will be avoided (Arc Infrastructure, 2024a). If a reduced area is feasible when works begin, clearing will be reduced at the time to avoid and reduce environmental impacts further (Arc Infrastructure, 2024a).

Arc Infrastructure are planning to revegetate along the banks of the waterway, using native riparian species, following the completion of works to offset the loss of native vegetation (Arc Infrastructure, 2024a).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the impacts of the proposed clearing present a risk to land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Environmental value (water resources) - Clearing Principle (f)

Assessment

The application area occurs within an environment associated with a waterbody, and the vegetation proposed to be cleared includes tree species of *Eucalyptus rudis* (flooded gum) and *Melaleuca rhaphiophylla* (swamp paperbark), which are indicative of a riparian zone. This riparian location was surveyed in 2023 and found to be in a Degraded (Keighery, 1994) condition, exhibiting signs of previous clearing, disturbance and subsequent regeneration with a high coverage of introduced weed species, including grasses, herbs and woody weeds, with a lack of mature trees. Arc Infrastructure are planning to revegetate along the banks of the waterway, using native riparian species, following the completion of works to offset the loss of native vegetation (Arc Infrastructure, 2024a).

It is not considered that the minimal clearing of 0.008 hectares within a Degraded location will reduce the condition of the area any further or result in any significant impacts to the ecological values of the vegetation communities associated with the waterbody. However, weeds have the potential to out-compete native flora and vegetation, reducing the success of native species to regenerate in the area. Potential impacts to the riparian zone as a result of the introduction and spread of weeds and dieback may be minimised by the implementation of appropriate management conditions.

Conclusion
For the reasons set out above, the proposed clearing of 0.008 hectares of native vegetation in an environment associated with a watercourse can be managed by taking steps to minimise the risk of the introduction and spread of weeds and dieback. In considering the above, the Delegated Officer determined that the impacts of the proposed clearing on water resources does not constitute a significant residual impact. To improve the ecological function of the waterway, Arc Infrastructure will revegetate along the banks of the waterway, using native riparian species.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- required to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback; and
- revegetate the areas that are no longer required to be maintained with native species.

3.2.2. Environmental value (land degradation) - Clearing Principles (g) and (j)

Assessment
The soils mapped within the application area are highly prone to wind erosion, water logging, water repellence, sub-surface acidification, nutrient export and acid sulphate soils. The 2023 survey identified a high to moderate risk of acid sulphate soil occurrence within three metres of the natural soil surface. Arc Infrastructure have committed to preparing Acid Sulphate Soil and Emergency Response Management Plans to minimise and mitigate the impacts associated with the clearing, removal and construction (Arc Infrastructure, 2024).

Since clearing activities will only affect the surface and will not reach the subsurface soils where acidification is likely to occur, the proposed clearing is unlikely to result in land degradation due to acid soils.

Noting the extent and location of the application area, including the Degraded (Keighery, 1994) condition of the vegetation within the application area and surrounds, the proposed clearing is not likely to have an appreciable impact on land degradation, with respect to wind erosion, water logging, or water repellence. Arc Infrastructure are planning to revegetate along the banks of the waterway, using native riparian species, following the completion of works to offset the loss of native vegetation, which will have a positive impact on the environmental values of the location.

Conclusion
Given the proposed clearing is limited to a maximum of 0.008 hectares of previously Degraded (Keighery, 1994) or cleared areas directly adjacent to existing railway bridge infrastructure, it is not considered likely that the proposed clearing will result in appreciable land degradation.

Conditions
No management conditions required.

3.3. Relevant planning instruments and other matters

The City of Bunbury advised DWER that local government approvals are not required. The location proposed to be cleared is reserved under the Greater Bunbury Region Scheme (GBRS), therefore, any works proposed to take place on the railway line are likely to be considered Public Works under the *Public Works Act 1902* and as a result would be exempt from GBRS planning approval (City of Bunbury, 2024).

The application area is located within the area registered under the *Gnaala Karla Booja Indigenous Land Use Agreement* (WI2015/005). Directly adjacent to the south of the area proposed to be cleared is the historic Aboriginal Cultural Heritage site - *Bunbury 11 - Artefacts / Scatter*. There is also a lodged Aboriginal Cultural Heritage site approximately 95 metres to the east of the application area - *Bunbury 07 - Artefacts / Scatter*, and a registered Aboriginal Cultural Heritage site approximately 360 metres to the east of the application area - *Preston River Camp - Birthplace; Camp; Historical; Traditional Structure; Water Source*. Several Aboriginal Cultural Heritage sites of significance have been mapped within the local area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B.

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of a fragmented patch of native vegetation, along the bank of a natural lake adjacent to a railway bridge, surrounded by industrial and residential land in the intensive land use zone of Western Australia. The application area is located approximately 4.5 kilometres south-east of the centre of Bunbury. Aerial imagery and spatial data indicates the local area (ten-kilometre radius from the centre of the area proposed to be cleared) retains approximately 22.80 per cent of the original native vegetation cover.
Ecological linkage	The proposed clearing area does not form part of any mapped ecological linkage.
Conservation areas	Kalgulup Regional Park (DBCA – 026) is located approximately 370 metres from the application area at its closest. This is the closest conservation area identified to the application area. The proposed clearing area is not mapped within a DBCA conservation area. Proposed clearing is not likely to impact the Regional Park.
Vegetation description	A 2023 vegetation survey (Arc Infrastructure, 2024b) indicated the vegetation within the proposed clearing area consists of one vegetation type, being *Eucalyptus rudis* low open woodland over open tall scrub of *Schinus terebinthifolia* over open shrubland of mixed native and introduced species over open grassland of introduced species dominated by **Cynodon dactylon*. Representative photos are available in Appendix D. This is consistent with a degraded version of the mapped vegetation type: • Southern River Complex - 42, which is described as an open woodland of *Corymbia calophylla* (marri) - *Eucalyptus marginata* (jarrah) - Banksia species with fringing woodland of *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark) along creek beds. The mapped vegetation type retains approximately 18.43 percent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Arc Infrastructure's 2023 vegetation survey (Arc Infrastructure, 2024b) indicates the vegetation within the proposed clearing area is in Degraded (Keighery, 1994) condition. Representative photos are available in Appendix D. The full Keighery (1994) condition rating scale is provided in Appendix C.
Climate and landform	The climate is classified as mediterranean, with dry, hot summers and cool, wet winters. The average rainfall is 666.2 millimetres per annum, with the majority falling between May and August.
Soil description	Two soil systems are mapped amongst the application areas. • (32.5 percent of application area) 212BsW_SWAMP - Sw - Swamp (Bassendean) • (67.5 percent of application area) 212Bs__B1a - Bassendean B1a Phase - Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within one metre of the surface; marri and jarrah dominant.
Land degradation risk	The land degradation table can be found in Appendix A.3., outlining the land degradation risk levels for the 212BsW_SWAMP and Bassendean B1a Phase (DPIRD, 2019).

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that the application area lies on the bank of the natural perennial waterbody/lake named Eedles Gully (Object ID 129847).
Hydrogeography	The application area falls within the Coastal Plain hydrological zone of Western Australia (HZ15_CP) - Coastal & fixed sand dunes and calcarenite. Non-calcareous sands, podsolised soils with low-lying wet areas. Further inland, alluvial deposits, colluvial deposits adjacent to the Darling Scarp. Clayey to sandy alluvial soils with wet areas. The area proposed to be cleared lies within the Leschenault Estuary_Preston River Catchment, the South West Catchment Division 6, and the Preston River Basin 611. The Preston River & Tributaries lays approximately 450 metres to the east of the application area. The application area is mapped within the Bunbury Groundwater Area as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act), however is not subject to an area protected under the *Country Water Supply Act 1917* (CAWS Act) or a Public Drinking water source area. The groundwater salinity levels (Total Dissolved Solids) is mapped as 500-1000 milligrams per litre (fresh).
Flora	No conservation significant flora were identified during the flora survey that was undertaken in October 2023 (Arc Infrastructure, 2024b). A total of 27 species from 13 families were identified within the survey area, comprised of 20 introduced species and seven native species. All species were able to be identified and a complete species list is provided in Appendix D. No Declared pests, Weeds of National Significance or species of conservation significance were identified. The species recorded to exhibit the highest vegetative cover were the introduced tree species **Schinus terebinthifolia* and the native *Eucalyptus rudis* (flooded gum). The overall density of introduced species was observed to be approximately 78.7 percent across the entire survey area (Arc Infrastructure, 2024b). Of the 36 conservation significant flora species identified during the desktop assessment, the majority (21) exhibit flowering periods consistent with the time of survey. Those remaining species either exhibit flowering periods inconsistent with the time of survey or possess insufficient data to determine flowering periods. Of these, 69 percent (nine) are tree, shrub and perennial herb species for which sufficient diagnostic characteristics to enable identification, to a minimum of genus level, would have been present in the absence of flowering characteristics. As a precaution, any species within these genera were marked in the field and confirmation of identification was made post-survey (Arc Infrastructure, 2024b).
Ecological communities	According to available mapping and spatial data, there are no ecological communities recorded in or adjacent to the application area. The survey provided as supporting evidence for this application identified the potential for 15 Threatened or Priority Ecological Communities (TEC's and PEC's) to occur within the survey area, however, none were determined to be present following analysis of the survey results (Arc Infrastructure, 2024b). The survey area was inconsistent with all 15 TEC and PEC's as a result of factors including species composition, species richness, vegetation structure, vegetation condition, soil type, hydrology and landform (Arc Infrastructure, 2024b).
Fauna	According to available mapping and spatial data, there are 51 conservation significant fauna species recorded in the local area (ten-kilometre radius from the centre of the area proposed to be cleared), however, nine of these are oceanic species and unlikely to occur in the application area. Eight of these species are listed as priority fauna, four are listed as Critically Endangered, nine are listed as Endangered, six are listed as Vulnerable, one is listed as Conservation Dependent, and one is list as 'Other specially protected species'. The remainder are listed as Migratory, while nine of the species listed on the EPBC Threatened list are also migratory species. None of these conservation significant species are likely to utilise the application area as critical habitat, due to the condition of the vegetation and species composition of the area. The area proposed to be cleared is mapped as distribution for *Zanda latirostris* (Carnaby's black cockatoo), *Zanda baudinii* (Baudin's black cockatoo) and

Characteristic	Details
	Calyptorhynchus banksii naso (forest red-tailed black cockatoo), which are listed as endangered and/or vulnerable under the BC Act and the Commonwealth EPBC Act. There are 11 black cockatoo roosts within the local area (10 kilometre radius of the application area) with the closest being approximately 650 metres from the application area. There is one confirmed and one potential black cockatoo breeding location recorded within the local area. According to survey results, there were no suitable breeding, roosting or foraging habitat for black cockatoos identified within the area proposed to be cleared (Arc Infrastructure, 2024b). All trees were below the minimum diameter at breast height (DBH) to be considered as potential habitat trees in the Swan Coastal Plain (DAWE, 2022) and none of the flora species identified provide high-value foraging resources (Arc Infrastructure, 2024b). Additionally, no evidence of black cockatoo nesting, roosting or foraging were observed within the survey area and surrounding vegetation at the time of the survey taking place (Arc Infrastructure, 2024b). There are 2852 records of *Pseudocheirus occidentalis* (western ringtail possum, ngwayir) in the local area, with the closest being approximately 0.38 kilometres from the application area. Western ringtail possum's are listed as Critically Endangered under the BC Act and the Commonwealth EPBC Act. There are large areas of vegetation, the closest being approximately 0.38 kilometres from the application area, mapped as medium to highly suitable habitat for this species. Noting the vegetation located within the application area and the preferred habitat of the species, it is unlikely that western ringtail possums utilise the area. Therefore the proposed clearing is unlikely to have a significant residual impact on the species.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion**					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex*					
Swan Coastal Plain - *Southern River Complex - 42*	58,781.48	10,832.18	18.43	940.36	1.60
Local area*					
10km radius	22,414.24	5,110.28	22.80	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Land degradation risk table

	212BsW_SWAMP - Swamp (Bassendean) (west application area)	212Bs__B1a - Bassendean B1a Phase (eastern application areas)
Wind erosion	L1: <3% of map unit has a high to extreme wind erosion risk	H1: 50-70% of map unit has a high to extreme wind erosion risk
Water erosion	L1: <3% of map unit has a high to extreme water erosion risk	
Water logging	H2: >70% of map unit has a moderate to very high waterlogging risk	L1: <3% of map unit has a moderate to very high waterlogging risk
Water Repellence	L1: <3% of map unit has a high water repellence risk	H2: >70% of map unit has a high water repellence risk
Sub-surface Acidification	H2: >70% of map unit has a high subsurface acidification risk or is presently acid	
Phosphorous export	H2: >70% of map unit has a high to extreme phosphorus export risk	M2: 30-50% of map unit has a high to extreme phosphorus export risk
Salinity	L1: <3% of map unit has a moderate to high salinity risk or is presently saline	
Flooding	L1: <3% of the map unit has a moderate to high flood risk	
Acid Sulphate Soils	High to moderate risk within 3m of the natural soil surface	

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared does not contain locally or regionally significant flora, fauna, habitats, assemblages of plants.	Not likely to be at variance	No
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared does not contain critical or significant foraging, roosting or breeding habitat for conservation significant fauna.	Not likely to be at variance	No
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain habitat for Threatened flora.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The area proposed to be cleared does not contain species that can indicate a threatened ecological community.	Not at variance	No
Environmental value: significant remnant vegetation and conservation areas		

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The mapped vegetation type (Southern River Complex_42) retains 18.43 percent of its pre-clearing extent (Government of Western Australia, 2019a), which is consistent with the retention target of at least 10 percent for the remaining vegetation complexes within the 'Greater Bunbury Region Constrained Area' of the Swan Coastal Plain (EPA, 2003). The vegetation within the application area is a degraded representative of the Southern River Complex_42. Whilst the application area is located within an extensively cleared landscape, the vegetation is not considered a significant remnant as it does not contain important flora or fauna habitat.	Not at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of the nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given the application area is located on the bank of a waterbody, the proposed clearing will involve clearing of riparian vegetation. The proposed clearing may impact on- or off-site hydrology and water quality in the short term, however lead to a degradation in the ecological function of the waterbody in the long term.	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils have a low susceptibility to water erosion, salinity and flooding. However, a higher susceptibility to wind erosion, water logging, water repellence, sub-surface acidification, nutrient export and acid sulphate soils. Noting the extent and location of the application area and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation.	May be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: There are no Public Drinking Water Sources Areas recorded within the application area, however, the proposed clearing is located adjacent to a natural perennial waterbody and within a groundwater	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
area proclaimed under the RIWI Act. Due to the location, nature and extent of the clearing, it is unlikely to impact surface or ground water quality.		
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils within the application area indicate that the proposed clearing may contribute to increased incidence or intensity of flooding. Given the application area is adjacent to a waterbody, the proposed clearing may to contribute to waterlogging. Noting the extent of the clearing and the condition of the vegetation, the proposed clearing is not likely to cause, or exacerbate, the incidence or intensity of flooding.	May be at variance	Yes *Refer to Section 3.2.2, above.*

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Biological survey information excerpts and photographs of the vegetation

Figure 2: Vegetation within the Dodson Road Bridge Survey Area, Bunbury.
Top: southwest bank. Centre: southeast bank. Bottom: northeast bank.

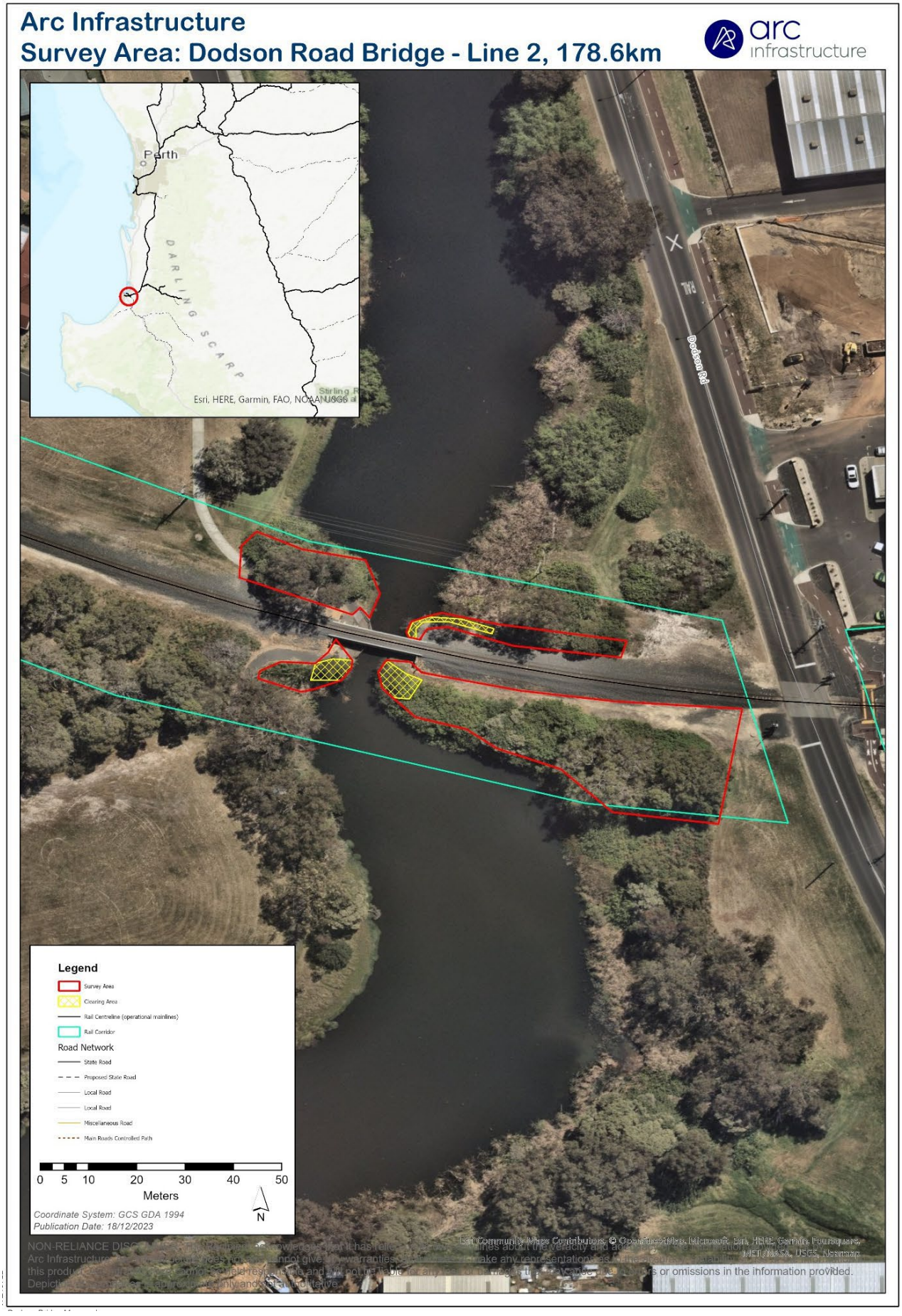

Figure 3: Survey Area Location at the Dodson Road Bridge, Bunbury

Table 1: Flora species recorded within the survey area

Family	Species Name	Common Name
Fabaceae	**Acacia longifolia*	
Poaceae	**Avena barbata*	Bearded Oat
Poaceae	**Bromus diandrus*	Great Brome
Poaceae	**Cynodon dactylon*	Couch
Cyperaceae	**Cyperus rotundus*	Nut Grass
Poaceae	**Eragrostis curvula*	African Lovegrass
Moraceae	**Ficus carica*	Common Fig
Rubiaceae	**Galium murale*	Small Goosegrass
Poaceae	**Lagurus ovatus*	Hare's Tail Grass
Poaceae	**Lolium rigidum*	Wimmera Ryegrass
Fabaceae	**Lupinus angustifolius*	Narrowleaf Lupin
Fabaceae	**Medicago polymorpha*	Burr Medic
Oleaceae	**Olea europaea*	Olive
Poaceae	**Paspalum dilatatum*	
Pittosporaceae	**Pittosporum undulatum*	
Plantaginaceae	**Plantago lanceolata*	Ribwort Plantain
Polygonaceae	**Rumex crispus*	Curled Dock
Anacardiaceae	**Schinus terebinthifolia*	
Fabaceae	**Trifolium campestre*	Hop Clover
Fabaceae	**Vicia sativa*	Common Vetch
Myrtaceae	*Eucalyptus rudis*	Flooded Gum
Cyperaceae	*Machaerina rubiginosa*	
Myrtaceae	*Melaleuca rhaphiophylla*	Swamp Paperbark
Myrtaceae	*Melaleuca viminalis*	
Polygonaceae	*Persicaria decipiens*	
Dennstaedtiaceae	*Pteridium esculentum*	Bracken
Typhaceae	*Typha orientalis*	Bulrush

Note: * Denotes introduced species

Appendix E. Sources of information

E.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Cultural Heritage - Register (DPLH-099)
- Aboriginal Cultural Heritage - Lodged (DPLH-100)
- Aboriginal Cultural Heritage - Historic (DPLH-098)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterpolygons
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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