



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 10193/1
File Number: DWERVT12645
Duration of Permit: From 30 October 2023 to 30 October 2025

PERMIT HOLDER

City of Bunbury

LAND ON WHICH CLEARING IS TO BE DONE

Lot 5354 on Deposited Plan 215092, South Bunbury
Lot 250 on Plan 2642, South Bunbury
Lot 244 on Plan 2642, South Bunbury
Lot 248 on Plan 2642, South Bunbury
Lot 247 on Plan 2642, South Bunbury
Lot 243 on Plan 2642, South Bunbury
Lot 249 on Plan 2642, South Bunbury
Lot 308 on Diagram 4030, South Bunbury
Lot 1 on Diagram 42436, South Bunbury
Lot 51 on Diagram 78228, South Bunbury

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.98 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 30 October 2025.

2. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the clearing of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

3. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

4. Directional clearing

The permit holder must:

- (a) conduct clearing authorised under this permit in one direction towards adjacent *native vegetation*; and
- (b) allow a reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the clearing activity.

5. Fauna management

Prior to undertaking any clearing authorised under this permit, the permit holder must:

- (a) inspect the area authorised to be cleared under this permit prior to works commencing and for the duration of clearing for any native fauna that may be present.
- (b) where native fauna have been identified under condition 5(a), works must cease until the fauna have escaped into adjacent habitat ahead of the clearing activity or translocated into adjacent *native vegetation*.

6. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 3; (g) actions taken to mitigate fauna impacts in accordance with condition 4; and (h) actions taken to manage fauna in accordance with condition 5.

7. Reporting

The permit holder must provide to the *CEO* the records required under condition 6 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of <i>Phytophthora</i> species on native vegetation.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.

Term	Definition
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
fill	means material used to increase the ground level, or to fill a depression.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

6 October 2023

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in the map below (

CPS 10193/1 - Map

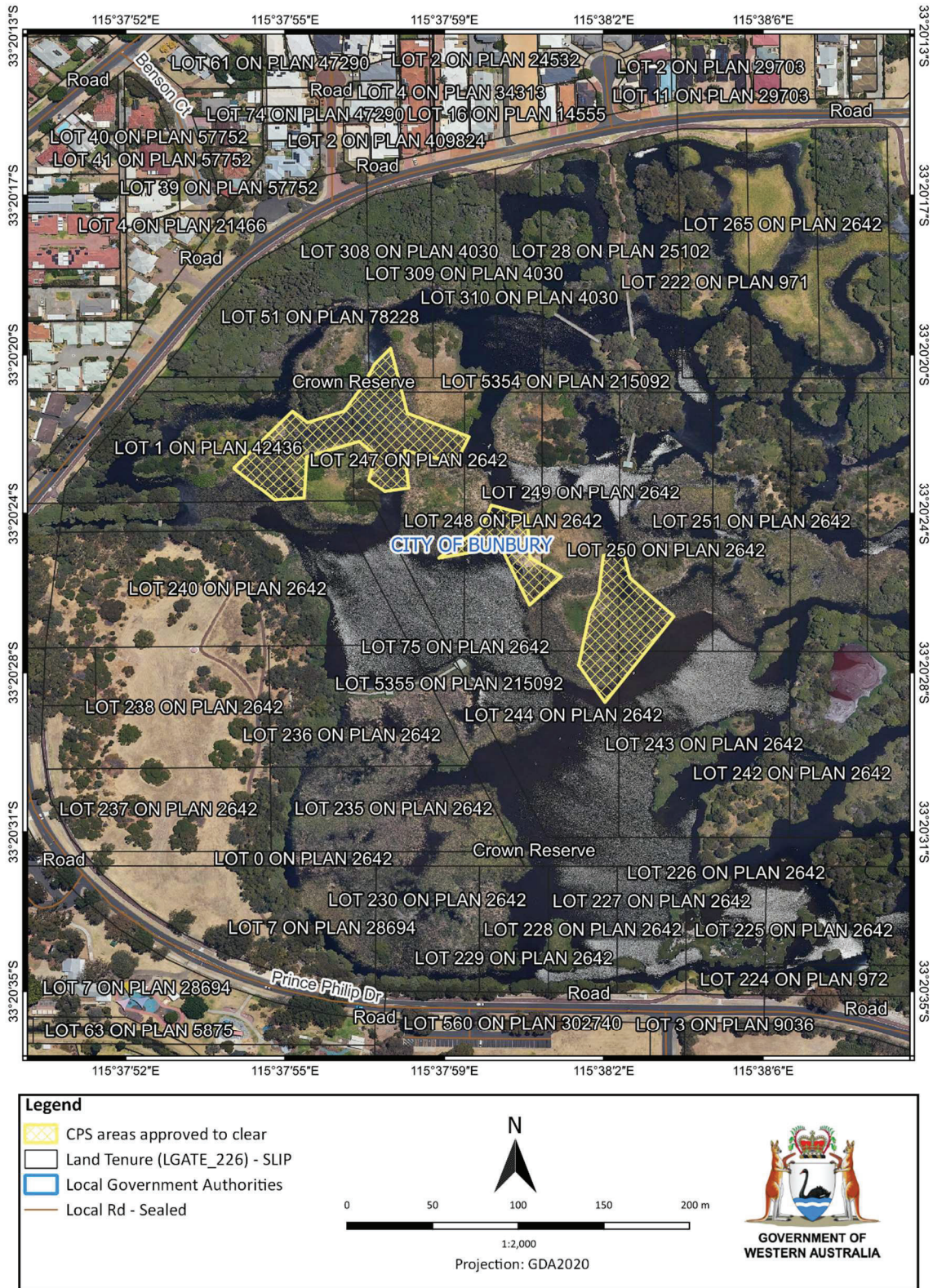


Figure 1).

CPS 10193/1 - Map

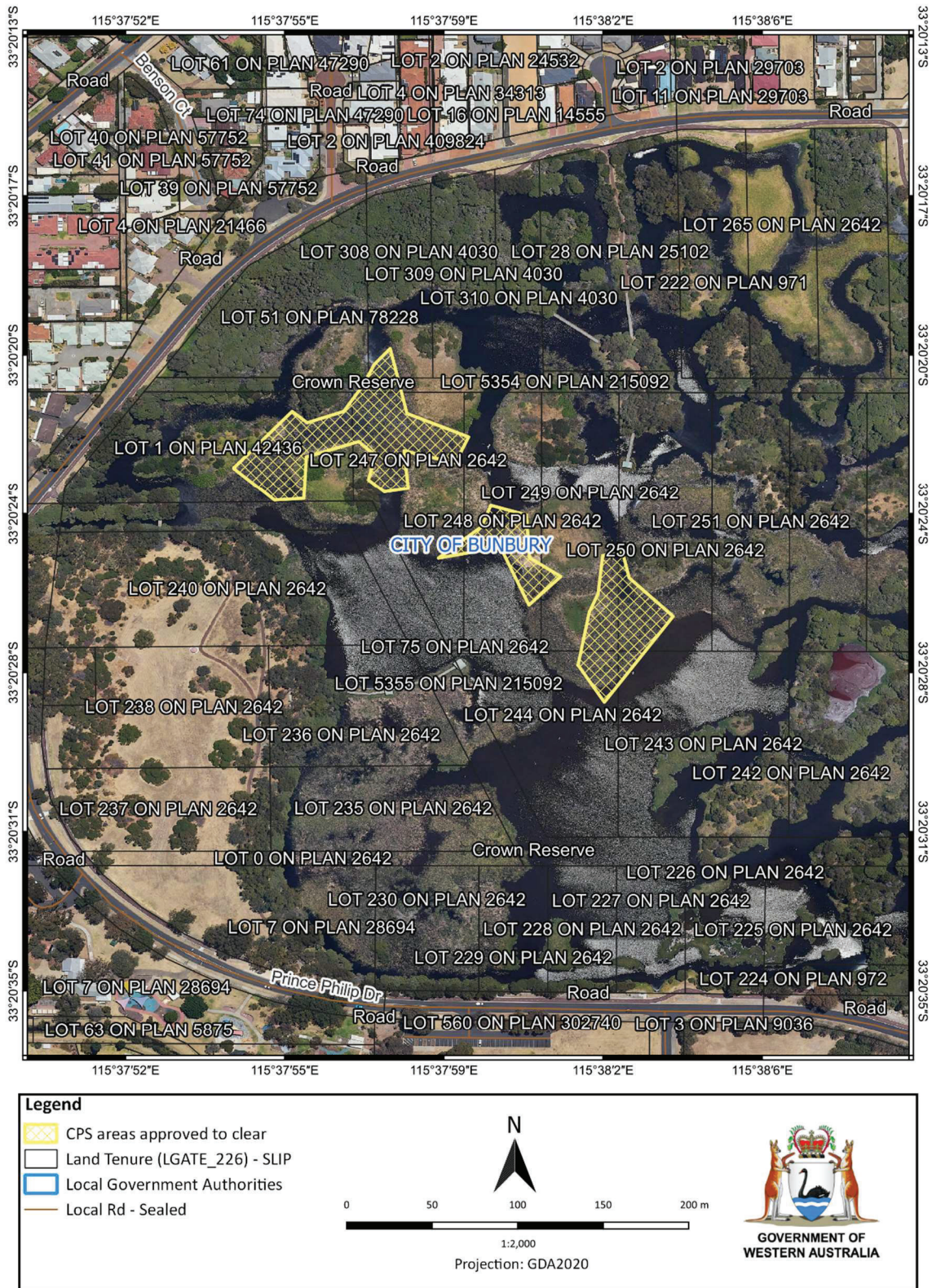


Figure 1: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10193/1
Permit type:	Area permit
Applicant name:	City of Bunbury
Application received:	12 May 2023
Application area:	0.98 hectares of native vegetation
Purpose of clearing:	Removal of <i>Typha orientalis</i>
Method of clearing:	Mechanical
Property:	Lot 5354 on Deposited Plan 215092 Lot 250 on Plan 2642 Lot 244 on Plan 2642 Lot 248 on Plan 2642 Lot 247 on Plan 2642 Lot 243 on Plan 2642 Lot 249 on Plan 2642 Lot 308 on Diagram 4030 Lot 1 on Diagram 42436 Lot 51 on Diagram 78228
Location (LGA area/s):	City of Bunbury
Localities (suburb/s):	South Bunbury

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single wetland also known as Big Swamp wetland reserve (see Figure 1, Section 1.5). The application is to selectively remove 0.98 hectares of *Typha orientalis* to improve water flow in the wetland and allow for recruitment of native species (City of Bunbury, 2023a). Clearing will be undertaken by mechanical means using an amphibious vehicle to cut the Typha below the water level and remove the surface biomass.

1.3. Decision on application

Decision:	Granted
Decision date:	6 October 2023
Decision area:	0.98 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 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 the purpose of the clearing permit is to remove *Typha orientalis* to improve water flow in the wetland and allow for recruitment of native species.

The assessment identified that the proposed clearing may result in:

- the loss of native vegetation that is suitable habitat for the blue billed duck (*Oxyura australis*); and
- 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.

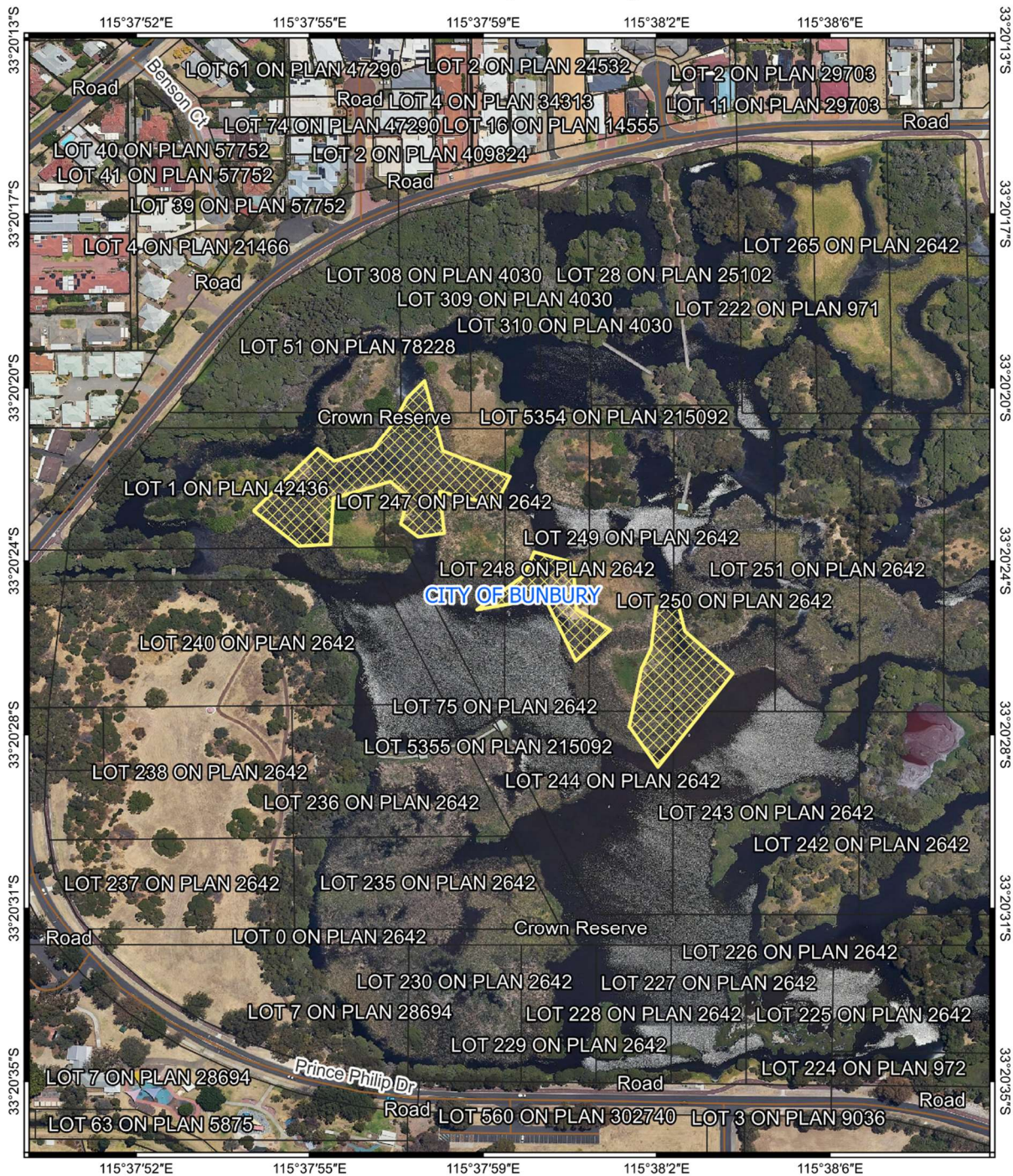
After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation or have long-term adverse impacts on the conservation significant fauna in the local area.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- pre-clearing site inspections prior to works commencing and ongoing during works for any fauna that may be present. If found and are not able to escape to adjacent habitat, the City of Bunbury is to cease works until the identified fauna has been translocated.

1.5. Site map

CPS 10193/1 - Map



Legend	
	CPS areas approved to clear
	Land Tenure (LGATE_226) - SLIP
	Local Government Authorities
	Local Rd - Sealed

0 50 100 150 200 m

1:2,000

Projection: GDA2020

GOVERNMENT OF WESTERN AUSTRALIA

Figure 1 Map of the application area
 The areas crosshatched yellow indicates 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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

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)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The method of clearing submitted by the applicant, with the utilisation of an amphibious machine, ensures that only Typha would be cleared, thus reducing impacts to surrounding vegetation (City of Bunbury, 2023a).

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 biological values (fauna), and 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. Biological values (fauna) - Clearing Principles (a, b)

Assessment

According to available datasets, none of the 53 conservation significant fauna in the local area have been found within the application area. The blue billed duck (*Oxyura australis*) has been recorded in the Big Swamp wetland reserve and is associated with Typha. The application area may provide suitable habitat for 13 conservation significant fauna which tend to occupy wetland habitats.

The application area may provide habitat for the following 11 migratory or wetland bird species. These species are:

- Sharp-tailed sandpiper (*Calidris acuminata*)
- Curlew sandpiper (*Calidris ferruginea*)
- Red-necked stint (*Calidris ruficollis*)
- Black bittern (*Ixobrychus flavicollis australis* (southwest subpop.))
- Black-tailed godwit (*Limosa limosa*)
- Glossy ibis (*Plegadis falcinellus*)
- Pacific golden plover (*Pluvialis fulva*)
- Grey plover (*Pluvialis squatarola*)
- Crested tern (*Thalasseus bergii*)
- Common greenshank (*Tringa nebularia*)
- Marsh sandpiper (*Tringa stagnatilis*)

The above migratory or wetland bird species do not depend exclusively on foraging or breeding in habitats prone to Typha infestation, however, may be present at the time of clearing. The application area is not likely to provide significant habitat for these species, therefore impacts on these species are likely to be minimal.

The Priority 4 blue billed duck (*Oxyura australis*) has 71 records in the local area with the closest approximately 40 metres from the application area. This species can breed from August to March, mostly between October to January (DBCA, 2021). Breeding habitat is typically secluded densely vegetated situations, with the nest constructed in Typha beds or other vegetation, in permanent water. Nests are usually constructed from dead Typha leaves and sometimes thinly lined with down (Birdlife Australia, 2020). As the application area includes Typha with records of the blue billed duck close by, this species could potentially be impacted by the proposed clearing.

The rakali (*Hydromys chrysogaster*) is a Priority 4 species with five records in the local area with the closest being 630 metres from the application area. Rakali are amphibious or semiaquatic mammals reaching up to 70 centimetres in length (from nose to end of the tail), feeding largely underwater, on a wide range of prey including large insects, crustaceans, mussels and fishes, and even frogs, lizards, small mammals and water birds. Although dependent on water for foraging, Rakali live on land, in burrows on low banks of rivers, lakes, wetlands, and estuaries including coastal areas. Intact riparian vegetation and associated bank stability is critical to their survival (DWER, 2021). While not likely to be present in the application area, they may range through the application area, as ranging territory can be up to four kilometres of riverbank (DWER, 2021).

The adjacent vegetation is susceptible to weed invasion and dieback in which the clearing process may exacerbate, thereby reducing habitat quality.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of breeding habitat and a source of nest building material for the Blue billed duck. There is a low probability that other migratory or wetland bird species may temporarily utilise the wetland as a foraging habitat. Rakali may also range through the application area, however Typha removal does not form a critical component of the habitat utilised by this species. For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed by conducting preclearing site inspections and slow direction clearing.

Conditions

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

- pre-clearing site inspections prior to works commencing and ongoing during works for any fauna that may be present. If found and are not able to escape into adjacent habitat, the City of Bunbury is to cease works until the identified fauna has left the clearing area.
- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.2.2. Land and water resources - Clearing Principles (f, g, i, j)

Assessment

The proposed clearing is for the purpose of controlling Typha due to its invasive nature and adverse impacts on wetlands in the absence of management. Given the proposed clearing will target Typha, the proposed clearing is not likely to result in any long-term impact to the ecological values of the wetland vegetation community within the application area.

The mapped soils are highly susceptible to waterlogging, subsurface acidification and phosphorus export. Given the selective clearing, and that Typha has been found to assist in neutralising acidity on re-wetting in areas that are prone to acid sulphate soils, the proposed clearing is unlikely to cause an appreciable increase to the existing risks of waterlogging, subsurface acidification and phosphorus export (DBCA, 2019).

The removal of Typha has the potential to increase sedimentation and turbidity the water within the application area, thereby possibly impacting surface water quality. The application area intersects the Bunbury Public Drinking Water Source Area and as herbicide may be used to clear Typha in riparian vegetation, the clearing is recommended to be consistent with best management practices to protect the water quality (DWER, 2023a). These guidelines include:

- Water Quality Protection Note (WQPN) 6: Vegetation buffers to sensitive water resources
- WQPN 10: Contaminant spills – emergency response plan
- WQPN 65: Toxic and hazardous substances

- Circular PSC88: Use of herbicides in water catchment areas.

The applicant confirmed the guidelines would be followed during the proposed clearing (City of Bunbury, 2023b). Given the invasiveness of Typha, the proposed clearing may improve drainage of water and reduce the incidence or intensity of flooding.

Conclusion

The proposed clearing will not significantly impact the surrounding riparian vegetation. The selective clearing is expected to enhance the habitat within the application area. The removal of Typha is meant to increase water drainage and reduce the risk of flooding. The selective clearing of Typha within the application area is not likely to lead to appreciable land degradation in the form of subsurface acidification, phosphorus export or water logging. No management conditions are required in relation to this environmental value.

3.3. Relevant planning instruments and other matters

The application area falls within the Bunbury Groundwater Area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). DWER's Water Licencing branch advised that a water licence or permit would not be required to undertake the clearing proposed (DWER, 2023b). The application area also falls within the Bunbury Water Reserve Public Drinking Water Source Areas, as proclaimed under the *Country Areas Water Supply Act 1947* but no permit is required as the activity is supported (CAWS Act; DWER, 2023a).

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End



Clearing Permit Decision Report

Appendix A. Site characteristics

A.1. 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.

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of the Big Swamp wetland and consists of the removal of <i>Typha orientalis</i> that has invasive tendencies and has reduced the water flow and biodiversity in the area. The wetland is used as a stormwater compensation basin while also a wetland used for recreational purposes.</p> <p>Aerial imagery indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 28.85 per cent of the original native vegetation cover</p>
Ecological linkage	There is no ecological linkage within the application area. The closest ecological linkage is the South West Regional Ecological linkage located 4.9 kilometres south of the application area. No linkages will be severed by the proposed clearing.
Conservation areas	There is no conservation area within the application area. The closest conservation area, Kalgulup Regional Park is approximately 2 kilometres south of the application area
Vegetation description	<p>Photographs supplied by the applicant indicate the vegetation within the proposed clearing area consists of <i>Typha</i> species. Representative photos are available in Appendix D.</p> <p>Mapped vegetation types include (Hedde et al. 1980):</p> <ul style="list-style-type: none"> Quindalup Complex, which is described as Coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of <i>Melaleuca lanceolata</i> (Rottnest Teatree) - <i>Callitris preissii</i> (Rottnest Island Pine), the closed scrub of <i>Acacia rostellifera</i> (Summer-scented Wattle) and the low closed <i>Agonis flexuosa</i> (Peppermint) forest of Geographe Bay. Vasse Complex, which is described as Mixture of the closed scrub of <i>Melaleuca</i> species fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca</i> species and open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri). Will include areas dominated by <i>Tecticornia</i> and <i>Sarcocornia</i> species (Samphire) near Mandurah and south of the Capel River. Yoongarillup Complex, which is described as Woodland to tall woodland of <i>Eucalyptus gomphocephala</i> (Tuart) with <i>Agonis flexuosa</i> in the second storey. Less consistently an open forest of <i>Eucalyptus gomphocephala</i> (Tuart) - <i>Eucalyptus marginata</i> (Jarrah) - <i>Corymbia calophylla</i> (Marri). South of Bunbury is characterized by <i>Eucalyptus rudis</i> (Flooded Gum)-<i>Melaleuca</i> species open forests <p>The mapped vegetation types retain approximately 60, 31 and 36 per cent respectively of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in a very good (Keighery, 1994) condition.

Characteristic	Details
	The full Keighery (1994) condition rating scale is provided in Appendix C. [Representative photos are available in Appendix D.
Climate and landform	<p>The climate is classified as Mediterranean, with dry, hot summers and cool, wet winters BOM, 2023).</p> <ul style="list-style-type: none"> • Average rainfall is 727.8 mm per year, with the majority falling between May and August • Average maximum temperature ranges from 17.3 degrees in winter to 30 degrees in summer • Average minimum temperatures range from 7.3 degrees in winter to 15.9 degrees in summer <p>The stands of Typha are on one landform the Spearwood System, which is described as sand dunes and plains. Yellow deep sands, pale deep sands and yellow/brown shallow sands.</p>
Soil description	The soil is mapped as Spearwood wet, swamp phase described as sand over limestone
Land degradation risk	The soil type is mapped as high risk for waterlogging, subsurface acidification and phosphorus export.
Waterbodies	The desktop assessment and aerial imagery indicated that the application area intersects a Swan Coastal Plain Geomorphic Wetland.
Hydrogeography	Located in the Bunbury Water Reserve Public Drinking Water Source Areas and the Bunbury Groundwater Areas under the RIWI Act.
Flora	<p>There are 24 conservation significant flora recorded in the local area with 18 associated with wetland vegetation although none were recorded in the same soil type.</p> <p>The closest conservation significant flora is 630 metres from the application area.</p> <p>The targeted nature of the clearing, being for Typha only, will not likely impact any conservation significant flora.</p>
Ecological communities	No Priority or Threatened Ecological Communities are recorded in the application area. The closest is the Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain 1.38 kilometres from the application area.
Fauna	There are 53 conservation significant fauna recorded in the local area with 13 fauna associated with wetland habitats. The closest record is the Blue-billed duck (<i>Oxyura australis</i>) which is 40 metres from the application area, recorded within the Big Swamp wetland area.

A.2. Fauna analysis table

Species name	Common name	Class	Conservation status	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Year	Are surveys adequate to identify? [Y, N, N/A]
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	BIRD	MI	N	5.20	8	2001	N/A
<i>Calidris ferruginea</i>	curlew sandpiper	BIRD	CR	Y	4.43	10	2002	N/A
<i>Calidris ruficollis</i>	Red-necked stint	BIRD	MI	Y	4.43	13	2002	N/A

Species name	Common name	Class	Conservation status	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Year	Are surveys adequate to identify? [Y, N, N/A]
<i>Hydromys chrysogaster</i>	Water-rat, rakali	MAMMAL	P4	Y	0.63	5	2017	N/A
<i>Ixobrychus flavicollis australis</i> (southwest subpop.)	black bittern (southwest subpop.)	BIRD	P2	N	5.39	1	1931	N/A
<i>Limosa limosa</i>	Black-tailed godwit	BIRD	MI	Y	1.76	1	2009	N/A
<i>Oxyura australis</i>	Blue-billed duck	BIRD	P4	Y	0.04	71	2011	N/A
<i>Plegadis falcinellus</i>	Glossy ibis	BIRD	MI	Y	0.04	3	2004	N/A
<i>Pluvialis fulva</i>	Pacific golden plover	BIRD	MI	N	5.20	2	2000	N/A
<i>Pluvialis squatarola</i>	Grey plover	BIRD	MI	Y	4.66	21	2002	N/A
<i>Thalasseus bergii</i>	Crested tern	BIRD	MI	Y	1.76	34	2013	N/A
<i>Tringa nebularia</i>	Common greenshank	BIRD	MI	Y	1.76	22	2010	N/A
<i>Tringa stagnatilis</i>	Marsh sandpiper	BIRD	MI	Y	4.66	1	2001	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p>Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The proposed clearing will target Typha. This species is capable of aggressive invasions that can transform ecosystems unless it is actively managed (Western Australian Herbarium, 2019). Without management, Typha can develop quickly into a monoculture and cover an entire water body. Given the application area, comprises predominantly of Typha and its tendency to colonise ecosystems, it is not anticipated that the proposed clearing will significantly impact fauna habitat or conservation significant assemblages of plants. The application area may contain suitable habitat and soils for a number of conservation significant fauna species.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p>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."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain foraging and breeding habitat for conservation significant fauna.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p>Principle (c): "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for threatened flora.</p>		
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species that can indicate a threatened ecological community.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area. Considering the targeted nature of <i>Typha orientalis</i> removal, the proposed clearing is unlikely to further degrade remnants of native vegetation in an area that has been extensively cleared. The application areas are not considered to be significant as a remnant.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p><i>Typha orientalis</i> forms a natural component of native wetland and watercourse vegetation. Noting the nature of the clearing, the proposed clearing is within an environment associated with a wetland. Given the nature of the proposed clearing, it is unlikely to significantly impact the wetland.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are highly susceptible to waterlogging, subsurface acidification and phosphorus export. <i>Typha orientalis</i> control methods proposed by the applicant (City of Canning 2023) will include slashing the plants below the water line and chemical control, which is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (i)</u>: “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.”</p> <p><u>Assessment</u>:</p> <p>Given the application area is within a wetland and a Public Drinking Water Sources Area, the proposed clearing may impact surface or ground water quality.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u>:</p> <p>In addition to improving wetland habitats, the purpose of the proposed clearing is to improve water flow, by monitoring and removing dense stands of <i>Typha orientalis</i>. The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>

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. Photographs of the vegetation



Figure 1: Photograph taken from the southern boardwalk at Big Swamp looking north (City of Bunbury, 2023a).



Figure 2: Photograph taken from the southern boardwalk at Big Swamp looking north-west (City of Bunbury, 2023a).

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 Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- 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 – Waterlines
- 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
- Wheatbelt Wetlands Stage 1 (DBCA-021)

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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