



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 9678/1
File Number: DWERVT9544
Duration of Permit: From 9 June 2022 to 9 June 2024

PERMIT HOLDER

City of Bunbury

LAND ON WHICH CLEARING IS TO BE DONE

Lot 200 on Diagram 65133, East Bunbury
Lot 507 on Diagram 23148, East Bunbury
Lot 5153 on Plan 9123, East Bunbury

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.285 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. 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.

2. 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.

3. Fauna management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise impact on fauna:

- 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 fauna have been identified under condition 3(a), works must cease until the fauna have escaped into adjacent habitat ahead of the clearing activity or translocated into adjacent *native vegetation*.
- c. conduct clearing activities in a slow, progressive manner towards adjacent *native vegetation* to allow fauna to escape into adjacent *native vegetation*.
- d. conduct clearing activities between February and September of the respective calendar year.

4. Wetland ecology management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise impact on the ecological values of the wetland:

- (a) avoid the use of chemicals in clearing and weed control activities.
- (b) remove any cleared plant materials from the wetland.

5. 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 Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared;

No.	Relevant matter	Specifications
		(d) the direction of clearing; (e) the size of the area cleared (in hectares); (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 1; (g) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 2. (h) fauna management actions taken in accordance with condition 3; and (i) actions taken in accordance with condition 4.

6. Reporting

The permit holder must provide to the *CEO* the records required under condition 5 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.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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

Term	Definition
	EP Act.
weeds	<p>means any plant –</p> <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*

16 May 2022

SCHEDULE 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1.).

Plan 9678/1



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 9678/1
Permit type:	Area permit
Applicant name:	City of Bunbury
Application received:	15 March 2022
Application area:	0.285 hectares (ha) of native vegetation
Purpose of clearing:	Removal of <i>Typha orientalis</i> (Typha)
Method of clearing:	Mechanical
Property:	Lot 200 on Diagram 65133 Lot 507 on Diagram 23148 Lot 5153 on Plan 9123
Location (LGA area/s):	East Bunbury
Localities (suburb/s):	City of Bunbury

1.2. Description of clearing activities

The application is to clear 0.285 ha of native vegetation comprising mostly of *Typha orientalis* (Typha). The application area is contained within a perennial lake measuring approximately 0.77 ha that is mapped as Multiple Use Geomorphic Wetland of Swan Coastal Plain (UFI 1111). Typha has grown intensively within the lake and identified as clogging the waterbody. The proposed clearing is required to thin out and control the growth of Typha.

The application area is surrounded by reserves and urban developments. The lake within which the application area is situated is a part of the drainage system in the local area.

1.3. Decision on application

Decision:	Granted
Decision date:	16 May 2022
Decision area:	0.285 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 14 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 need to manage Typha growth within the application area.

In particular, the Delegated Officer considerations include the following:

- Typha can be invasive and present a threat to wetlands environment.
- The proposed clearing will remove some Typha that may provide habitat to fauna species. Given the limited extent of clearing, this impact is unlikely to be significant. Fauna management could minimise and mitigate the potential impacts of clearing on fauna habitat.
- Clearing may introduce and spread weeds and dieback into adjacent vegetation. This impact can be minimised and mitigated with appropriate weeds and dieback control measures.
- Clearing activities may disturb the bed of the wetland and affect its water quality. Noting the limited extent of clearing, the impact is likely to be insignificant and short term.

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 and water degradation or have long-term adverse impacts on fauna. Potential impacts on the above mentioned environmental values can be minimised and managed by imposing management conditions to the permit.

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
- clearing is to not occur between October to January
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- remove cleared vegetation from the wetlands after clearing.

1.5. Site map

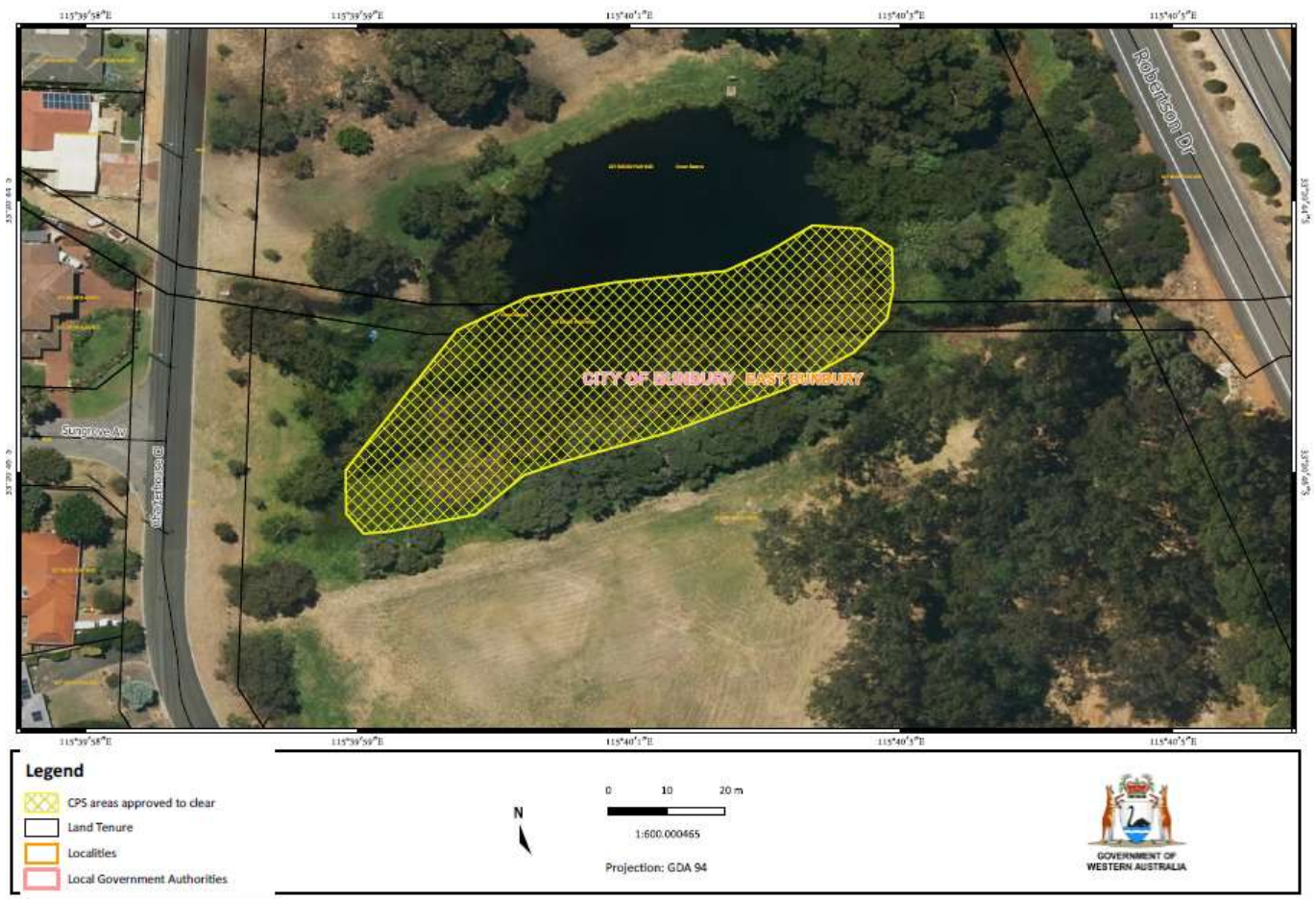


Figure 1 Map of the application area

The area crosshatched yellow indicates the area 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)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D 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)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant has limited the clearing extent to the Typha community identified as having invasive growth. The purpose of clearing is to improve the ecological values of the wetland.

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 may present a risk to 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 – Biodiversity and Fauna – Clearing principles (a) and (b)

Assessment:

Typha orientalis is native to Western Australia. The hardy perennial aquatic plant can thrive very well in eutrophic wetlands and waterways (Mun, G.H. and Jae G.K.; 2016). In many instances, Typha can aggressively colonise disturbed wetlands and waterways and present a major threat to the conservation values of the wet areas. Management of Typha is therefore often required for affected wetlands and waterways.

The lake / wetland where the Typha removal is proposed, is situated at end of a drainage system in the developed urban area of the City of Bunbury. As such, the lake is likely to have been receiving nutrient run off from the surrounding environment.

Seventeen conservation significant flora species have been recorded from the local area. Given the aggressive nature of Typha present, and the likelihood that the lake is highly eutrophic, the application area is unlikely to comprise

suitable habitat for the conservation significant flora. Clearing is therefore unlikely impact the conservation significant flora in the local context.

Typha communities have been known to provide habitats to fauna, particularly water birds and other aquatic fauna. At least 55 conservation significant fauna have been recorded from the local area. Many of the records are associated with the marine and shoreline environments, which are not represented by the application area. Some migratory birds may utilise the application area and surround, but the application area is unlikely to comprise significant habitat to these migratory birds.

Black cockatoo species and Western Ring-tailed possum (WRP) are recorded from the local area, with the closest records from within 200 metres from the application area. However, it is unlikely for both fauna species to inhabit the Typha community. Removal of Typha from the lake is unlikely to impact Black cockatoos and WRP.

Of the recorded conservation significant fauna, the Black-stripe minnow (*Galaxiella nigrostriatal*) (EN), Carter's freshwater mussel (*Westralunio carteri*) (VU) and Blue billed duck (*Oxyura australis*) (P4) recorded from within 5 km from the application are most likely to occur in the application area and surround. The local area is within the known distribution areas for the abovementioned fauna species.

The Black-striped minnow is often found in ephemeral waterways or lakes. With its ability to burrow into the muds, this fauna species can survive in receding water environment. Given the permanent nature of the wetland proposed to be cleared, the lake is unlikely to provide significant habitat for Black-stripped minnow. Noting the limited extent of clearing, impact to this fauna species, if present, can be minimised by applying fauna management.

Carter's freshwater mussel occurs in great abundance in slower flowing water where sediments are stable and soft enough to burrow. Although the freshwater mussel has also been found in lentic systems such as lakes and wetlands, its preference to flowing water habitats suggests that their occurrence in the Typha infested wetland is unlikely.

Blue billed duck has been recorded from approximately 600 metres from the application area. This waterbird had been recorded from other Typha communities where it breeds and nests on constructed Typha beds. Blue billed duck can breed from August to March, mostly between October to January (DBCA 2021). DBCA (2021) advised that many waterbirds, including the Blue-billed duck, may move between wetland areas within south-western Western Australia depending on wetland condition, resource availability, breeding season and bird age (juvenile dispersal and pre-breeding). They are not categorised as migratory as this movement between areas is not a migration pattern or regular period movement. Most bird species, including waterbirds, breed in late Winter to Summer. Breeding may occur outside of this main seasonal period if the environmental conditions are suitable.

Given the above, and in the absence of fauna survey, the likelihood for the conservation significant fauna species and other waterbird species to occur within or utilise the application area cannot be ruled out. Noting the limited extent and nature of clearing, the impact on the fauna species is likely to be insignificant and short-term, particularly if it is conducted outside of the breeding period. Impact of clearing on fauna can be managed by applying appropriate fauna management measures. Given the habitat values of the wetland, the use of chemicals for clearing should also be avoided (DBCA, 2021).

Conclusion:

Based on the above assessment, the proposed clearing is unlikely to impact on the maintenance and conservation of conservation significant flora and fauna. Impacts to the habitat values of the wetland can be avoided and mitigated by placing management measures and conditions on the permit.

Conditions:

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

- Clearing is not to occur between October to January.
- 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 been translocated.
- Slow directional clearing to allow fauna individuals present to move into adjacent habitat ahead of the clearing activity will minimise impact to individuals
- Avoid using chemicals within the wetland areas

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

Assessment:

Excessive presence of Typha communities can have adverse impacts on the ecological values of wetlands. Management of Typha is therefore often required to improve the ecological values of affected wetlands. Within this context, the proposed clearing is not likely to result in any long-term impact to the ecological values of the wetland and surround.

The clearing activities, however, will disturb the bed of the wetlands, which may lead to increased turbidity and sedimentation. Given the extent of clearing and the lentic nature of the wetland, this impact is likely to be short-term and localised. The proposed clearing is unlikely to lead to appreciable degradation to the water resource.

The soils in the application area are prone to wind erosion and acidification. Given that clearing will take place in wet areas, the proposed clearing is unlikely to lead to land degradation from wind erosion. However, considering the soils' susceptibility to acidification, excessive addition of biomass into the wetland may lead to increased acidity as a result of anaerobic decomposition of the biomass. Removal of dead Typha from the wetland after clearing could avoid and mitigate this impact.

Clearing can also introduce and spread weeds, including the Typha species, and dieback to nearby vegetation or habitat. Stringent weed and dieback control measures can avoid and mitigate this impact.

Conclusion:

Based on the above assessment, the proposed clearing is unlikely to result in permanent and appreciable land degradation. The potential impacts can be minimised and mitigated by applying management measures.

Conditions:

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

- Removal of biomass from the lake after clearing
- Weeds and dieback management.

3.3. Relevant planning instruments and other matters

The proposed clearing area is within a wetland in a local park utilised for public recreation. The park is located on parcels of land vested to and managed by the City of Bunbury by the Department of Planning, Lands and Heritage for the purpose of drainage and public recreation.

Under the direction of DBCA (2019), given the classification of *Typha orientalis* as native to Western Australia, the clearing of Typha on land not managed by DBCA or without prior approved management plan is not exempt from having to have a Clearing Permit.

Several Aboriginal 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 characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of the 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	<p>The area proposed to be cleared is part of a Typha community within a perennial lake in a recreational park. The lake is surrounded by urban developments within the City of Bunbury.</p> <p>The local area (10 km radius) retains approximately 33 per cent of native vegetation cover.</p>
Ecological linkage	The Typha community proposed to be cleared is not a part of any formal ecological linkages in the region.
Conservation areas	The application area is approximately 100 metres from a regional park, which is situated along the stream east of Robertson Road.
Vegetation description	<p>Photographs provided by the applicant indicate the vegetation within the application area consists of mainly Typha. Although not a part of the vegetation proposed to be cleared, flooded gum (<i>Eucalyptus rudis</i>) and Swamp paperbark (<i>Melaleuca rhapsiophylla</i>) can be seen on the edges of the lake.</p> <p>Apart from the Typha proposed to be cleared, the vegetation around the lake appears to be consistent with the mapped vegetation type of Southern River Complex; which is characterised as "Open woodland of <i>Corymbia calophylla</i> (Marri) - <i>Eucalyptus marginata</i> (Jarrah) - Banksia species with fringing woodland of <i>Eucalyptus rudis</i> (Flooded Gum) - <i>Melaleuca rhapsiophylla</i> (Swamp Paperbark) along creek beds".</p> <p>The mapped vegetation complex retain approximately 27 per cent of the original extent (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Photographs supplied by the applicant indicate the vegetation within the proposed clearing area is in Degraded condition (Keighery, 1994).</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix C..</p>
Soil description	<p>The soils are mapped as:</p> <ul style="list-style-type: none"> Pinjarra P6c Phase, described as very gently undulating alluvial terraces and fans. Moderate to moderately well drained uniform friable brown loams, or well structured gradational brown earths Spearwood S2a Phase, described as Lower slopes (1-5%) of dune ridge with moderately deep to deep siliceous yellow-brown sands or pale sands with yellow-brown subsoils and minor limestone outcrop.
Land degradation risk	The soils of the application area have low risks of degradation from salinity, water logging, flooding and water erosion; and medium risk to wind erosion and subsurface acidification.
Waterbodies	The application area is within an unnamed perennial lake / swamp measuring 0.77 ha in size. The lake is one of three lakes / swamps within the property and is approximately 100 metres from a perennial tributary of the Preston River.
Hydrogeography	The application area is within the Coastal Plain Hydrogeological Zone of Western Australia. It is within the catchment area of the Leschenault Estuary – Preston River.
Flora	Seventeen conservation significant flora species have been recorded from the local area. None of these recorded species occur within the application area.
Ecological communities	The vegetation within the application area does not exhibit the characteristics of any priority (PEC) or threatened ecological community (TEC). Several TEC/PEC are

Characteristic	Details
	mapped within the local area, the closest one is a small patch of vegetation mapped as a Banksia Woodlands of the Swan Coastal Plain, located approximately 0.1 km from the application area.
Fauna	Several conservation significant fauna have been recorded from the local area. The closest records include the Black cockatoo species, Western Ringtail Possum and Blue-billed duck.

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	587,813	38.62		
Vegetation complex					
Southern River Complex (42)	87,476.26	23,508.66	26.87	1,881.84	2.15
Local area (calculation - delete if not required)					
10km radius	7,171	2,405	33.54	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Flora analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix E.1) impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Acacia flagelliformis</i>	4	N	N	Y	2.16	3	N/A
<i>Acacia semitrullata</i>	4	N	N	N	9.21	2	N/A
<i>Aponogeton hexatepalus</i>	4	N	N	Y	3.03	14	N/A
<i>Austrostipa bronwenae</i>	T	N	N	Y	1.91	1	N/A
<i>Austrostipa jacobiana</i>	T	N	N	Y	3.91	1	N/A
<i>Caladenia speciosa</i>	4	N	N	Y	1.45	8	N/A
<i>Carex tereticaulis</i>	3	N	N	Y	8.31	2	N/A
<i>Diuris drummondii</i>	T	N	N	Y	1.52	3	N/A

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Drakaea micrantha</i>	T	N	N	N	9.46	1	N/A
<i>Lasiopetalum membranaceum</i>	3	N	N	Y	1.51	8	N/A
<i>Ornduffia submersa</i>	4	N	N	N	6.10	1	N/A
<i>Platysace ramosissima</i>	3	N	N	Y	2.45	1	N/A
<i>Pultenaea skinneri</i>	4	N	N	Y	3.41	5	N/A
<i>Schoenus benthamii</i>	3	N	N	Y	2.62	1	N/A
<i>Stylidium longitubum</i>	4	N	N	Y	5.51	1	N/A
<i>Synaphea odocoileops</i>	1	N	N	N	9.71	1	N/A
<i>Verticordia attenuata</i>	3	N	N	N	4.93	3	N/A

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

A.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Anous tenuirostris melanops</i> (Australian lesser noddy)	EN	N	N	7.54	1	N/A
<i>Arenaria interpres</i> (Ruddy turnstone)	MI	N	N	3.31	4	N/A
<i>Calidris acuminata</i> (Sharp-tailed sandpiper)	MI	N	N	3.53	10	N/A
<i>Calidris canutus</i> (Red knot)	EN	N	N	3.47	1	N/A
<i>Calidris ferruginea</i> (curlew sandpiper)	CR	N	N	3.47	12	N/A
<i>Calidris ruficollis</i> (Red-necked stint)	MI	N	N	3.31	15	N/A
<i>Calidris tenuirostris</i> (Great knot)	CR	N	N	3.31	8	N/A
<i>Calyptorhynchus banksii naso</i> (Forest red-tailed black cockatoo)	VU	N	N	2.28	13	N/A
<i>Calyptorhynchus baudinii</i> (Baudin's cockatoo)	EN	N	N	1.68	7	N/A
<i>Calyptorhynchus latirostris</i> (Carnaby's cockatoo)	EN	N	N	0.69	82	N/A
<i>Calyptorhynchus</i> sp. 'white-tailed black cockatoo' (White-tailed black cockatoo)	EN	N	N	0.14	16	N/A
<i>Charadrius leschenaultia</i> (Greater sand plover, large sand plover)	VU	N	N	4.19	1	N/A
<i>Ctenotus ora</i> (Coastal Plains skink)	P3	N	N	3.06	2	N/A
<i>Dasyurus geoffroii</i> (chuditch, western quoll)	VU	N	N	4.16	1	N/A
<i>Diomedea exulans</i> (wandering albatross)	VU	N	N	3.39	2	N/A
<i>Falco peregrinus</i> (Peregrine falcon)	OS	Y	Y	2.29	1	N/A
<i>Galaxiella nigrostriatal</i> (black-stripe minnow, black-striped dwarf galaxias)	EN	Y	Y	4.70	2	N/A

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Geotria australis</i> (Pouched lamprey)	P3	N	N	3.39	7	N/A
<i>Hydromys chrysogaster</i> (water-rat, rakali)	P4	N	N	3.39	6	N/A
<i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)	P3	Y	Y	2.46	16	N/A
<i>Isoodon fusciventer</i> (Quenda, southwestern brown bandicoot)	P4	N	N	1.55	31	N/A
<i>Ixobrychus flavicollis australis</i> (southwest subpop.)(black bittern (southwest subpop.))	P2	Y	Y	2.26	1	N/A
<i>Limosa lapponica</i> (Bar-tailed godwit)	MI	Y	Y	2.72	23	N/A
<i>Limosa limosa</i> (Black-tailed godwit)	MI	Y	Y	2.72	1	N/A
<i>Macronectes giganteus</i> (southern giant petrel)	MI	N	N	3.25	2	N/A
<i>Notamacropus irma</i> (Western brush wallaby)	P4	N	N	2.10	18	N/A
<i>Numenius madagascariensis</i> (Eastern curlew)	CR	N	N	2.98	16	N/A
<i>Numenius phaeopus</i> (Whimbrel)	MI	N	N	1.36	6	N/A
<i>Oceanites oceanicus</i> (Wilson's storm-petrel)	MI	N	N	2.08	1	N/A
<i>Oxyura australis</i> (Blue-billed duck)	P4	Y	Y	0.63	72	N/A
<i>Phascogale tapoatafa wambenger</i> (South-western brush-tailed phascogale, wambenger)	CD	N	N	1.18	54	N/A
<i>Plegadis falcinellus</i> (Glossy ibis)	MI	Y	Y	3.10	3	N/A
<i>Pluvialis fulva</i> (Pacific golden plover)	MI	N	N	4.19	2	N/A
<i>Pluvialis squatarola</i> (Grey plover)	MI	N	N	3.31	24	N/A
<i>Pseudocheirus occidentalis</i> (Western ringtail possum, ngwayir)	CR	N	N	0.11	2111	N/A
<i>Psophodes nigrogularis</i> (western whiplbird)	EN or P4	Y	Y	1.41	2	N/A
<i>Psophodes nigrogularis nigrogularis</i> (western whiplbird (western heath))	EN	Y	Y	2.15	1	N/A
<i>Setonix brachyurus</i> (Quokka)	VU	N	N	8.41	2	N/A
<i>Sterna hirundo</i> (Common tern)	MI	Y	Y	2.72	1	N/A
<i>Thalassarche carteri</i> (Indian yellow-nosed albatross)	EN	N	N	3.88	4	N/A
<i>Thalassarche chrysostoma</i> (Grey-headed albatross)	VU	N	N	3.39	2	N/A
<i>Thalassarche melanophris</i> (black-browed albatross)	EN	N	N	3.88	1	N/A
<i>Thalasseus bergii</i> (Crested tern)	MI	N	N	1.21	46	N/A
<i>Thinornis rubricollis</i> (hooded plover, hooded dotterel)	P4	N	N	7.22	1	N/A
<i>Tringa nebularia</i> (Common greenshank, greenshank)	MI	Y	Y	2.72	31	N/A
<i>Tringa stagnatilis</i> (Marsh sandpiper, little greenshank)	MI	N	N	3.31	2	N/A
<i>Westralunio carteri</i> (Carter's freshwater mussel)	VU	Y	Y	3.21	4	N/A

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

A.5. Ecological community analysis table

Community name	Commonwealth - Conservation status	DBCA / State WA conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	Priority 3	Endangered	N	N	N	0.10
<i>Corymbia calophylla</i> - <i>Xanthorrhoea preissii</i> woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. (1994))	Critically Endangered	Endangered	N	N	N	8.19
<i>Corymbia calophylla</i> woodlands on heavy soils of the southern Swan Coastal Plain (floristic community type 1b as originally described in Gibson et al. (1994))	Vulnerable		N	N	N	9.38
Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	N	N	N	1.86
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	N	N	N	2.62
Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered	N	N	N	2.88
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in Gibson et al. (1994))	Critically Endangered	Endangered	N	N	N	5.56
Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in Gibson et al. (1994))	Vulnerable		N	N	N	3.46
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. (1994))	Endangered	Critically Endangered	N	N	N	4.35
Subtropical and Temperate Coastal Saltmarsh	Priority 3	Vulnerable	N	N	N	2.69
Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain	Priority 3	Critically Endangered	N	N	N	0.32

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

A.6. Land degradation risk table

Risk categories	Land Unit 1
Wind erosion	M1: 10-30% of the map unit has a high to extreme hazard
Water erosion	L2: 3-10% of the map unit has a very high to extreme hazard
Salinity	L2: 3-10% of the map unit has a moderate or high hazard or is presently saline
Subsurface Acidification	M2: 30-50% of the map unit has a high susceptibility
Flood risk	L1: <3% of the map unit has a moderate to high hazard
Water logging	L2: 3-10% of the map unit has a moderate to very high to risk
Phosphorus export risk	L2: 3-10% of the map unit has a high to extreme hazard

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is significantly disturbed and does not contain significant flora, fauna, habitats, or assemblages of plants. However, significant number of flora and fauna have been recorded from the local area (10 km radius).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</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 significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>No records of conservation significant fauna have been known from the application area. However, the lake within which the proposed clearing is situated may provide habitats for fauna species associated with freshwater lakes.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain Threatened Flora.</p>	Not likely to be at variance	No
<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 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 native vegetation in the local area is consistent 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 or remnant in the local area.</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 and the extent of clearing, the proposed clearing is not likely to have an impact on the environmental values of any conservation areas.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
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>Clearing may impact the environmental values of the lake, even if temporarily. The Typha is growing in an environment associated with a 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 proposed clearing is situated within a lake. The clearing is unlikely to result in an appreciable land degradation if dead material is removed from the lake.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above</i>
<p><u>Principle (i)</u>: <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.”</i></p> <p><u>Assessment</u>:</p> <p>Clearing may impact the water quality of the lake. Given the nature and extent of clearing, the impact is likely to be temporary.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (j)</u>: <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment</u>:</p> <p>The removal of Typha from the lake is unlikely to contribute to increased incidence or intensity of flooding or waterlogging.</p>	Not likely to be at variance	No

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 2, The vegetation within the application area comprises of mostly *Typha* communities. Fringing *Eucalyptus rudis* and *Melaleuca raphiophylla* are not included in the application area (City of Bunbury, 2022).

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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