



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10091/1
Permit Holder:	Peel-Harvey Catchment Council
Duration of Permit:	From 11 August 2023 to 11 August 2028

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of *Typha* species removal.

2. Land on which clearing is to be done

Lot 33 on Deposited Plan 89615, Boddington
Lot 84 on Deposited Plan 403065, Boddington
Lot 62 on Deposited Plan 144657, Boddington
Lot 2 on Diagram 16287, Boddington
Lot 140 on Deposited Plan 215188, Boddington
Lot 166 on Deposited Plan 189624, Boddington
Lot 15755 on Plan 15859, Boddington
Lot 172 on Deposited Plan 243154, Boddington
Lot 173 on Deposited Plan 243154, Boddington
Lot 180 on Deposited Plan 33781, Boddington
Lot 9005 on Deposited Plan 60465, Boddington
Lot 501 on Deposited Plan 75278, Boddington
Lot 100 on Deposited Plan 411277, Boddington
Lot 100 on Deposited Plan 421144, Boddington
Hakea Road Reserves (PINs 1188295, 11067671, 11351545, 11351558), Boddington
Bannister-Marradong Road Reserve (PIN 11351536), Boddington
Colin Street Road Reserve (PIN 11351546), Boddington
Farmers Avenue Road Reserve (PIN 11351547), Boddington
Pollard Street Road Reserve (PIN 11351560), Boddington
unnamed Road Reserve (PIN 11351582), Boddington

3. Clearing authorised

The permit holder must not clear more than 0.5 hectares of *native vegetation* within the areas cross-hatched yellow in Figures 1-3 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. 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.

5. 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.

6. Directional clearing

- (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.

7. Fauna Management

- (a) Prior to undertaking any clearing authorised under this permit, the permit holder must 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 7(a), works must cease until the fauna have escaped into adjacent habitat ahead of the clearing activity or translocated into adjacent *native vegetation*.

8. Weed management – Chemical

Undertake spraying of herbicide during the driest period of the year when the water level is at its lowest and during calm conditions.

PART III - RECORD KEEPING AND REPORTING

9. 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 2020 (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 4 (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5 (g) actions taken to mitigate fauna impacts in accordance with condition 6 (h) actions taken to mitigate fauna management in accordance with condition 7 (i) The date that chemical weed control occurred in accordance with condition 8

10. Reporting

The permit holder must provide to the *CEO* the records required under condition 9 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 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)

Term	Definition
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 – (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*

18 July 2023

Schedule 1

Plan 10091/1

The boundary of the areas authorised to be cleared is shown in the maps below (Figure 1-3).

CPS 10091/1 - Plan A



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

CPS 10091/1 - Plan C

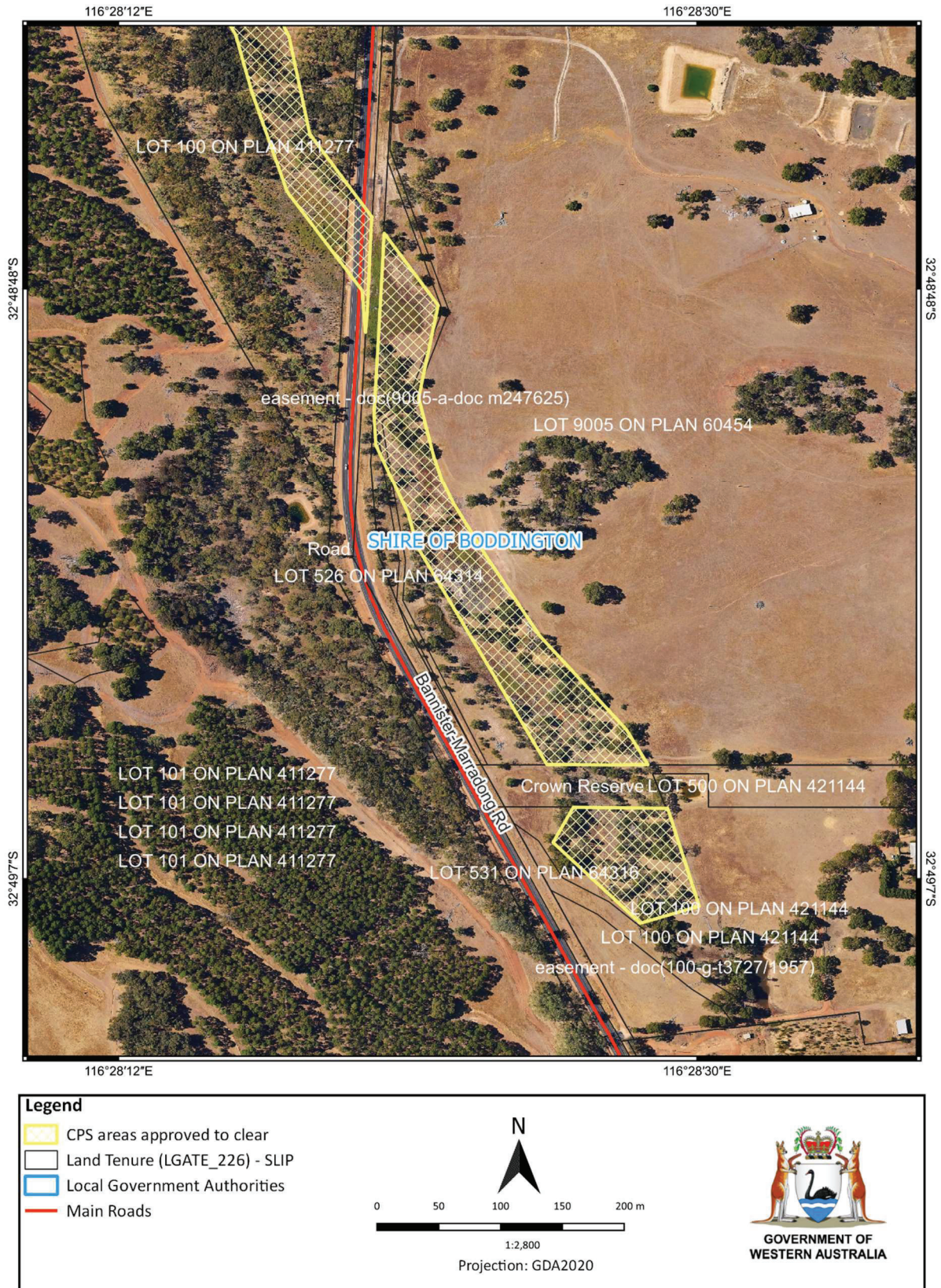


Figure 3: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10091/1
Permit type:	Purpose permit
Applicant name:	Peel-Harvey Catchment Council
Application received:	27 February 2023
Application area:	0.5 hectares of native vegetation
Purpose of clearing:	<i>Typha</i> species removal
Method of clearing:	Mechanical
Property:	List of properties (Refer to Appendix A)
Location (LGA area/s):	Shire of Boddington
Localities (suburb/s):	Boddington

1.2. Description of clearing activities

The application is to selectively clear 0.5 hectares of *Typha* species along a minor tributary of the Hotham river within a broader 10.14 hectare clearing footprint. The clearing will target two *Typha* species, *Typha domingensis* and *T. orientalis* and will take place within various properties and road reserves in the Shire of Boddington. The *Typha* will be cleared using herbicide. The applicant proposes to clear *Typha* species over multiple years to maintain the restoration sites.

1.3. Decision on application

Decision:	Granted
Decision date:	18 July 2023
Decision area:	0.5 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 C), 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 is to remove *Typha* species to maintain restoration areas.

The assessment identified that the proposed clearing may result in:

- the loss of native vegetation that may provide suitable habitat for conservation significant fauna as they move through the landscape

- 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 and;
- the potential to increase sedimentation and turbidity within the application area, thereby possibly impacting surface water quality.

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, impact significant fauna habitat or degrade adjacent habitat values provided management measures are in place.

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

- avoid, minimise to reduce the impacts and extent of clearing
- undertake spraying of herbicide during the driest period of the year when the water level is at its lowest and during calm conditions.
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- undertake slow, progressive one directional clearing to allow fauna to move into adjacent habitat ahead of the clearing activity; and
- 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 Peel-Harvey Catchment Council is to cease works until the identified fauna has been translocated.

1.5. Site maps

CPS 10091/1 - Plan A



Figure 1 Plan A of the application area. The area crosshatched yellow indicate the area authorised to be cleared under the granted clearing permit.

CPS 10091/1 - Plan B



Legend

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

N

0 50 100 150 200 m

1:2,800

Projection: GDA2020

GOVERNMENT OF WESTERN AUSTRALIA

Figure 2 Plan B of the application area. The area crosshatched yellow indicate the area authorised to be cleared under the granted clearing permit.

CPS 10091/1 - Plan C

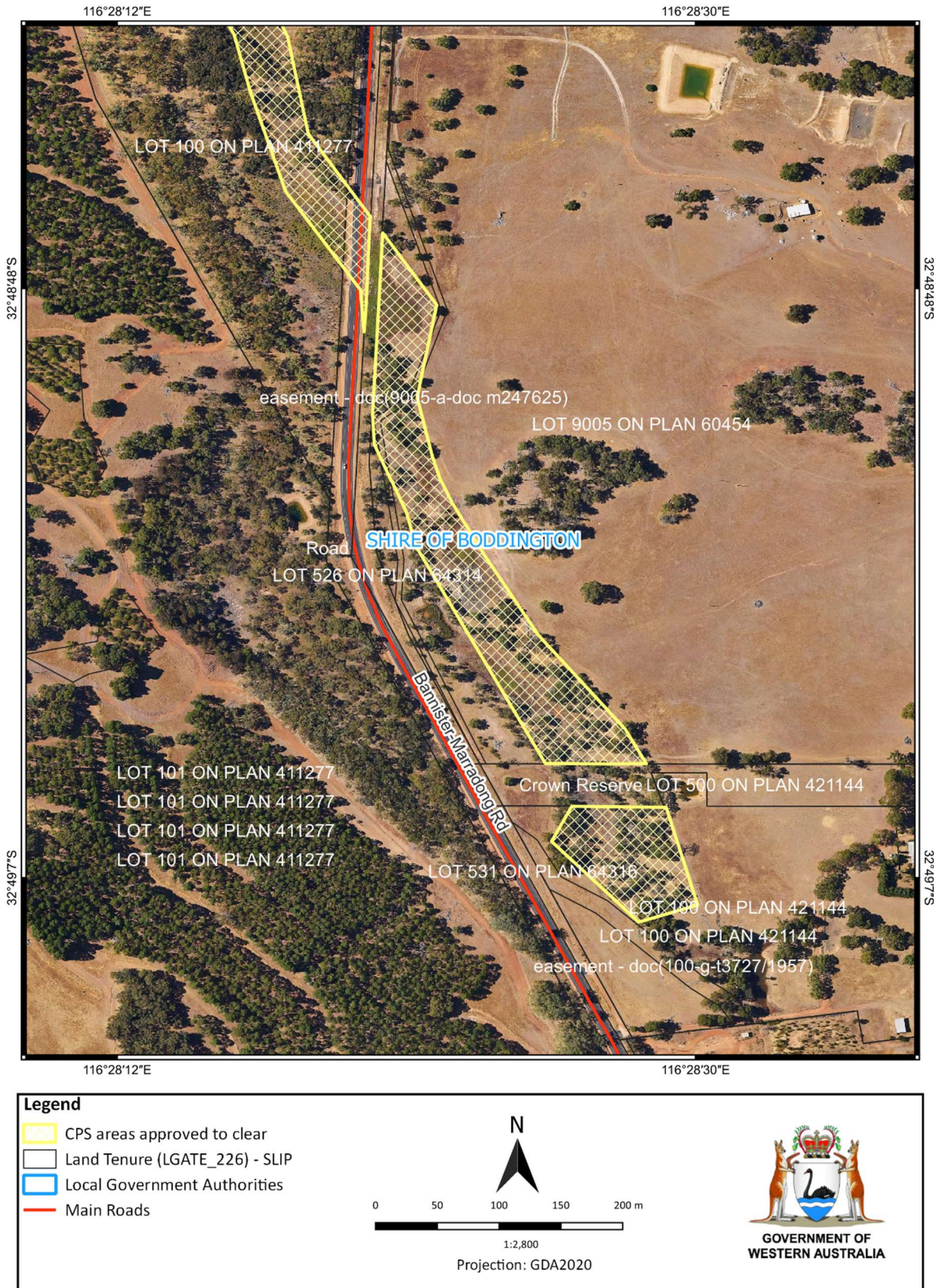


Figure 3 Plan C of the application area. The area crosshatched yellow indicate the area authorised to be cleared under the granted clearing permit.

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)
- *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)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant advised that only Typha would be cleared as a part of the application. The applicant has proposed to only spray herbicide using specific and controlled hand application in appropriate weather and site conditions and during the appropriate control window for the Typha species (Peel and Harvey Catchment Council, 2023).

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 C) identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora) 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) and (b)

Assessment

According to available databases, four conservation significant fauna species associated with water courses have been recorded in the local area with one recorded inside the application area. These include four mammals, the chuditch (*Dasyurus geoffroii*), the rakali (*Hydromys chrysogaster*), the quenda (*Isoodon fusciventer*) and the numbat (*Myrmecobius fasciatus*).

The numbat (*Myrmecobius fasciatus*) is an endangered mammal that was last recorded in the application area in 1960. The only remaining numbat subpopulations are at Dryandra woodland around 150 km south-east of Perth and the Upper Warren area approximately 280 km south-east of Perth, with 12 translocation sites since 1985. The numbat prefers eucalypt forest, eucalypt woodland, *Acacia* woodland and *Triodia* grassland with an open understorey to feed on termites (DPAW, 2017). Given the historical record and limited presence in the area since 1960, it is unlikely to be present in the application area.

The chuditch (*Dasyurus geoffroii*), is a vulnerable quoll species recorded 370 metres from the application area in 2020. It is a carnivorous marsupial about the size of a small domestic cat. The densest populations have been found in riparian jarrah forest and they can travel long distances and have large home ranges (DEC, 2012). As they prefer larger areas of native vegetation, chuditch may traverse through the application area as they move through the landscape to larger patches of native vegetation. Given the targeted nature of the clearing, the clearing is unlikely to impact significant habitat for this species.

The quenda (*Isoodon fusciventer*) is a priority 4 species recorded 370 metres from the application area in 2014. The quenda is an omnivorous ground dwelling medium sized bandicoot and have been known to persist in urban areas and remnant vegetation (Howard et al, 2014). Quendas can be found in wetlands and riparian areas with low, dense vegetation for foraging. While it may be present in the application area, the targeted nature of the clearing is unlikely to impact significant habitat for this species.

The rakali (*Hydromys chrysogaster*) is a priority 4 species recorded two kilometres from the application area in 2017. 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 rakali have not been recorded in the application area they may range through the area as ranging territory can be up to four kilometres of riverbank (DWER, 2021). It is unlikely the proposed clearing will impact this species as Typha does not form a critical component of its habitat.

Conclusion

Based on the above assessment, the proposed clearing will result in the loss of habitat that may be used by conservation significant fauna as they move through the landscape. For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed through slow directional clearing. Given the targeted nature of the clearing, the clearing is unlikely to impact significant habitat for conservation significant fauna.

Conditions

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

- 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
- 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 Peel-Harvey Catchment Council is to cease works until the identified fauna has been translocated

3.2.2. Biological values (flora) - Clearing Principles (a) and (c)

Assessment

According to available databases, no conservation significant flora have been recorded within the application area. The Priority 3 *Banksia subpinnatifida* var. *imberbis* has been recorded 50 metres from the application area. This species is not recorded as occurring within stands of Typha. As the proposed clearing will only target Typha, it is unlikely any conservation significant flora will be impacted during removal.

The applicant proposes to apply chemical treatment to clear the Typha and this has the potential to impact adjacent habitat. The applicant has advised that the herbicide will be applied specifically and through controlled hand action in appropriate weather and site conditions (Peel Harvey Catchment Council, 2023).

Conclusion

Based on the above assessment, the proposed clearing is unlikely to result in a significant loss in biodiversity or impact populations of threatened and priority flora.

Conditions

To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- Undertake spraying of herbicide during the driest period of the year when the water level is at its lowest and during calm conditions.

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

Assessment

The proposed clearing is for the purpose of controlling the occurrence of Typha due to its invasive nature and adverse impacts on riparian ecosystems 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 riparian vegetation communities within the application area.

All soil units mapped within the application area indicated a high risk of subsurface acid sulphate soil (see Table B.4.). Typha has been found to assist in neutralising acidity on re-wetting in areas that are prone to acid sulphate soils (DBCA, 2019). Given the nature of the proposed clearing activities, the most likely land degradation impacts anticipated to result from the proposed clearing would be wind and surface water erosion of the exposed ground. As the clearing is selectively clearing Typha, it is unlikely that the proposed clearing would have an appreciable increase to the existing risks of wind and surface water erosion.

The removal of Typha has the potential to increase sedimentation and turbidity of the water within the application area, thereby possibly impacting surface water quality. However, due to the small scale of the clearing, it is not likely to cause long-term deterioration in the quality of surface water. 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 riparian vegetation and is expected to enhance riparian habitat within the application area. The selective clearing of Typha within the application area is not likely to lead to appreciable land degradation in the form of subsurface acidification, water and wind erosion. No management conditions are required in relation to this environmental value.

3.3. Relevant planning instruments and other matters

The Shire of Boddington advised DWER that local government approvals are not required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The Shire did not have any objections to the proposed clearing (Shire of Boddington, 2023).

The application area falls within the Murray River System Surface Water Area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). DWER Water Licencing determined that a water licence or permit would not be required to undertake the clearing proposed. However the use of methods outlined in the Stream Stabilisation River restoration 2001 report to manage water quality impacts in sites affected by construction or removal activities should be adhered to (DWER, 2023).

An Aboriginal site of significance have been mapped within the application area, the Hotham River (Place ID 27935). 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. Property list

Property	Locality
Lot 33 on Deposited Plan 89615 (R14963)	Boddington
Lot 12 on Deposited Plan 66695	Boddington
Lot 84 on Deposited Plan 403065 (R14963)	Boddington
Lot 62 on Deposited Plan 144657 (Boddington Pool)	Boddington
Lot 2 on Diagram 16287	Boddington
Lot 140 on Deposited Plan 215188 (R44556)	Boddington
Lot 166 on Deposited Plan 189624 (R44556)	Boddington
Lot 15755 on Plan 15859 (R40647)	Boddington
Lot 172 on Deposited Plan 243154 (R26566)	Boddington
Lot 173 on Deposited Plan 243154 (R26566)	Boddington
Lot 180 on Deposited Plan 33781 (R42226)	Boddington
Lot 9005 on Deposited Plan 60465	Boddington
Lot 501 on Deposited Plan 75278 (R14977)	Boddington
Lot 100 on Deposited Plan 411277	Boddington
Lot 100 on Deposited Plan 421144	Boddington
Hakea Road Reserves (PINs 1188295, 11067671, 11351545, 11351558)	Boddington
Bannister-Marradong Road Reserve (PIN 11351536)	Boddington
Colin Street Road Reserve (PIN 11351546)	Boddington
Farmers Avenue Road Reserve (PIN 11351547)	Boddington
Pollard Street Road Reserve (PIN 11351560)	Boddington
Unnamed road reserve (PIN 11351582)	Boddington

Appendix B. Site characteristics

B.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 C.

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of a patch of native vegetation along a tributary of the Hotham river in the intensive land use zone of Western Australia. Clearing will be restricted to the removal of Typha from the riparian vegetation.</p> <p>Aerial imagery indicates the local area (10 kilometre radius from the centre of the area proposed to be cleared) retains approximately 41 per cent of the original native vegetation cover.</p>
Ecological linkage	The application area intersects a south west regional ecological linkage. The proposed clearing of the application will not sever or severely impact the function of this ecological linkage.
Conservation areas	The closest conservation area is a DBCA timber reserve 370 metres south-west of the application area. Proposed clearing will not impact this reserve.

Characteristic	Details
Vegetation description	<p>The proposed clearing targets the removal of <i>Typha</i> species growing in association with a natural water course.</p> <p>According to available data sets, the vegetation in the application area is the Darling Plateau subregion (Heddl et al., 1980) that contains the following mapped vegetation types:</p> <ul style="list-style-type: none"> • Coolakin 51 described as a woodland of <i>Eucalyptus wandoo</i> with mixtures of <i>Eucalyptus patens</i>, <i>Eucalyptus marginata</i> subsp. <i>thalassica</i> and <i>Corymbia calophylla</i> on the valley slopes in arid and perarid zones. • Michibin 185 described as a open woodland of <i>Eucalyptus wandoo</i> over <i>Acacia acuminata</i> with some <i>Eucalyptus loxophleba</i> on valley slopes, with low woodland of <i>Allocasuarina huegeliana</i> on or near shallow granite outcrops in arid and perarid zones. • Williams 301 described as a mixture of woodland of <i>Eucalyptus rudis-Melaleuca raphiophylla</i>, low forest of <i>Casuarina obesa</i> and tall shrubland of <i>Melaleuca</i> spp. on major valley systems in arid and perarid zones. <p>The mapped vegetation types retain approximately 39, 26 and 26 per cent of the original extent respectively (Government of Western Australia, 2019).</p>
Vegetation condition	<p>Aerial imagery indicate the vegetation within the proposed clearing area is in good to completely degraded (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix D.</p>
Climate and landform	<p>The application area experiences a Mediterranean climate with an annual mean maximum temperature of 23.8 degrees Celsius and annual mean minimum temperature of 8 degrees Celsius. The mean annual rainfall is approximately 521 millimetres (BOM, 2023).</p> <p>The application area comprises of two landforms:</p> <ul style="list-style-type: none"> • Quindanning system described as deep granitic valleys, in the northern and central eastern Darling Range, with deep sandy duplex soils, shallow sand, loamy duplex and bare rock with marri-wandoo-york gum-jam woodland • Marradong upland system described as plateau remnants, in the central eastern Darling Range, with sandy gravel, loamy gravel, grey deep sandy duplex and loamy duplex with jarrah-marri-wandoo forest and woodland.
Soil description	<p>The soil is mapped as:</p> <ul style="list-style-type: none"> • Williams subsystem (Quindanning): Valley floor subtended by the steep slopes of the Michibin unit; Yellow/brown deep sandy duplexes, brown deep loamy duplexes, grey deep sandy duplexes and wet and semi-wet soils • Norrine subsystem (Quindanning): A complex of lateritic residuals and associated pediment; Loamy gravels, duplex sandy gravels and red shallow loamy duplexes • Michibin subsystem (Quindanning): Hillslopes containing soils formed by the weathering of fresh rock. Rock outcrop is common; Brown deep loamy duplexes, yellow/brown deep sandy duplexes, grey deep sandy duplexes, red shallow loams and gravels • Coolakin subsystem (Marradong): Minor Valleys bounded by Dwellingup or Norrine units; moderate slopes with gravelly and sandy yellow duplex soils; a minor valley floor with sandy alluvium; occasional rock outcrops and laterite spur; Loamy gravels, duplex sandy gravels, brown deep loamy duplexes, brown loamy earths, deep sandy gravels and wet and semi-wet soils (sometimes saline) (DPIRD, 2019).
Land degradation risk	<p>There is a high amount of variability in the land degradation risk between the four soils occurring across the application area. All four had a high risk of subsurface acidification, with Norrine having a high risk of wind erosion and the rest having low to medium risk. See table in B.4. for a full analysis of soil risks.</p>

Characteristic	Details
Waterbodies	The desktop assessment and aerial imagery indicated that a minor non perennial tributary of the Hotham river runs through the majority of the application area with the northern section of the application area along the banks of the major Hotham river.
Hydrogeography	The application area falls within the Murray River system surface water area and is in the 1000-3000 mg per litre groundwater salinity area. Part of the application area is within a 1 in 10 AEP floodplain area.
Flora	A total of eight conservation significant flora occur within the local area with the closest record 46 metres from the application area. There is one species of conservation significant flora that is known to be associated with wetland habitat and could possibly occur adjacent to Typha stands. Noting the clearing will be the targeted application of herbicide on Typha, impacts to conservation significant flora is considered low.
Ecological communities	One priority ecological community is mapped as occurring in the local area the 'Mount Saddleback heath communities' which is a Priority 1 under DBCA. This is mapped 3.5 kilometres from the application area and does not include Typha species.
Fauna	A total of 19 conservation significant fauna occur in the local area with one recorded within the application area, the Numbat (<i>Myrmecobius fasciatus</i>). Three conservation significant fauna are known to occur in wetland habitats and could possibly occur near the Typha stands.

B.2. Flora analysis table

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

Species name	Conservation status	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Likelihood	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Banksia subpinnatifida</i> var. <i>imberbis</i>	P3	Y	Y	High	0.05	1	N/A

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

B.3. Fauna analysis table

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

Species name	Common name	Class	Conservation status	Distance of closest record to application area (km)	Number of known records (total)	Year recorded
<i>Myrmecobius fasciatus</i>	numbat, walpurti	MAMMAL	EN	0	1	1960
<i>Dasyurus geoffroii</i>	chuditch, western quoll	MAMMAL	VU	0.37	41	2020
<i>Hydromys chrysogaster</i>	water-rat, rakali	MAMMAL	P4	2.09	5	2017
<i>Isodon fusciventer</i>	Quenda, southwestern brown bandicoot	MAMMAL	P4	0.37	11	2014

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

B.4. Land degradation risk table

Risk categories	Coolakin subsystem (Marradong)	Michibin subsystem (Quindanning)	Norrine subsystem (Quindanning)	Williams subsystem (Quindanning)
Wind erosion	M2	M1	H1	M1
Water erosion	M1	L2	M1	L1
Water repellence	M1	L2	L2	L1
Salinity	M1	L1	L1	M1
Subsurface Acidification	H2	H2	H2	H2
Flood risk	L2	L1	L1	M1
Water logging	M1	L1	L1	M1
Phosphorus export risk	M1	M1	M1	M1

L1: <3% of map unit has a high to extreme risk, L2: 3-10% of map unit has a high to extreme risk, M1: 10-30% of map unit has a high to extreme risk, M2: 30-50% of map unit has a high to extreme risk, H1: 50-70% of map unit has a high to extreme risk, H2: >70% of map unit has a high to extreme risk

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p>Principle (a): <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing will target Typha species. 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. As the application area, comprises predominantly of Typha or areas where Typha may germinate in subsequent years and its tendency to colonise ecosystems, it is not anticipated that the proposed clearing will significantly impact the biodiversity within the application area. As the clearing will target Typha it is unlikely that flora species of conservation significance or Threatened or Priority ecological communities occur within the application area.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p>Principle (b): <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>The area proposed to be cleared is not likely to contain significant habitat for conservation significant fauna. However fauna may be present at the time of clearing.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p>Principle (c): <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 not likely to contain habitat for Threatened flora species.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p>Principle (d): <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 at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
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 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 in the local area.</p>	Not 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>Given the application area is associated with a water course, the proposed clearing is growing in an environment associated with a water course. However, Typha can dominate riparian ecosystems and reduce biodiversity. Given the nature of the proposed clearing it is unlikely to significantly impact the watercourse.</p>	At variance	Yes <i>Refer to Section 3.2.3, 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 wind erosion and subsurface acidification. Noting the location of the application area and the condition of the vegetation, the proposed clearing may have an appreciable impact on land degradation.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, 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>Given the application area is associated with a water course, the proposed clearing may impact surface or ground water quality. All impacts are anticipated to be localised and temporary.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, 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 purpose of the clearing is to remove Typha and improve water drainage which reduces the likelihood, incidence and intensity of flooding in the area.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>

Appendix D. 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 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)

E.2. References

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