GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10738/1
Permit Holder:	City of Joondalup
Duration of Permit:	From 16 December 2024 to 16 December 2034

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 managing and controlling the spread of *Typha orientalis* and *Typha domingensis*.

2. Land on which clearing is to be done

Refer to Table 1 in Schedule 1.

3. Clearing authorised

The permit holder must not clear more than 4.18 hectares of *native vegetation* within the areas cross-hatched yellow in Figures 1-11 of Schedule 2.

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

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.

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 *native vegetation*.

8. Weed Management – Chemical

Undertake spraying of chemical solution 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	(a) the species composition, structure, and density of the *cleared* area; (b) the location where the *clearing* occurred, recorded

No.	Relevant matter	Specifications
		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 *weeds* and *dieback* in accordance with condition 5; (g) Fauna management actions undertaken in accordance with condition 7; and (h) The date(s) in which 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

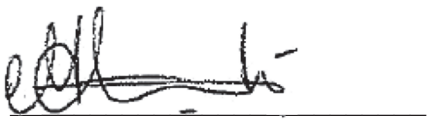
In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
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 *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (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 EP Act.
weeds	means any plant –

Term	Definition
	(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; 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



Meenu Vitarana
Manager
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

22 November 2024

Schedule 1

Table 1: Land on which clearing is to be done

Property	Locality
Lot 11576 on Deposited Plan 17959	Joondalup
Oahu Gardens Road Reserve (PIN 11487178)	Sorrento
Lot 14406 on Deposited Plan 29812	Joondalup
Lot 10446 on Deposited Plan 215799	Hillarys
Lot 13364 on Deposited Plan 220258	Sorrento
Lot 12290 on Diagram 83892	Hillarys
Lot 500 on Deposited Plan 417015	Hillarys
Lot 12518 on Plan 20963	Hillarys
Lot 11575 on Plan 17959	Joondalup
Lot 13365 on Deposited Plan 220258	Sorrento
Lot 459 on Deposited Plan 51290	Hillarys
Lot 12032 on Plan 18934	Hillarys
Lot 14466 on Deposited Plan 31007	Iluka
Lot 12033 on Plan 18934	Hillarys
Lot 12271 on Diagram 83892	Hillarys
Lot 12289 on Plan 19491	Hillarys
Lot 11866 on Plan 18562	Ocean Reef
Lot 12260 on Plan 14912	Mullaloo

Schedule 2

The boundary of the areas authorised to be cleared are shown in the maps below (Figures 1-11).

Figure 1: CPS 10738/1 areas approved to clear

Figure 2: CPS 10738/1 areas approved to clear

Figure 3: CPS 10738/1 areas approved to clear

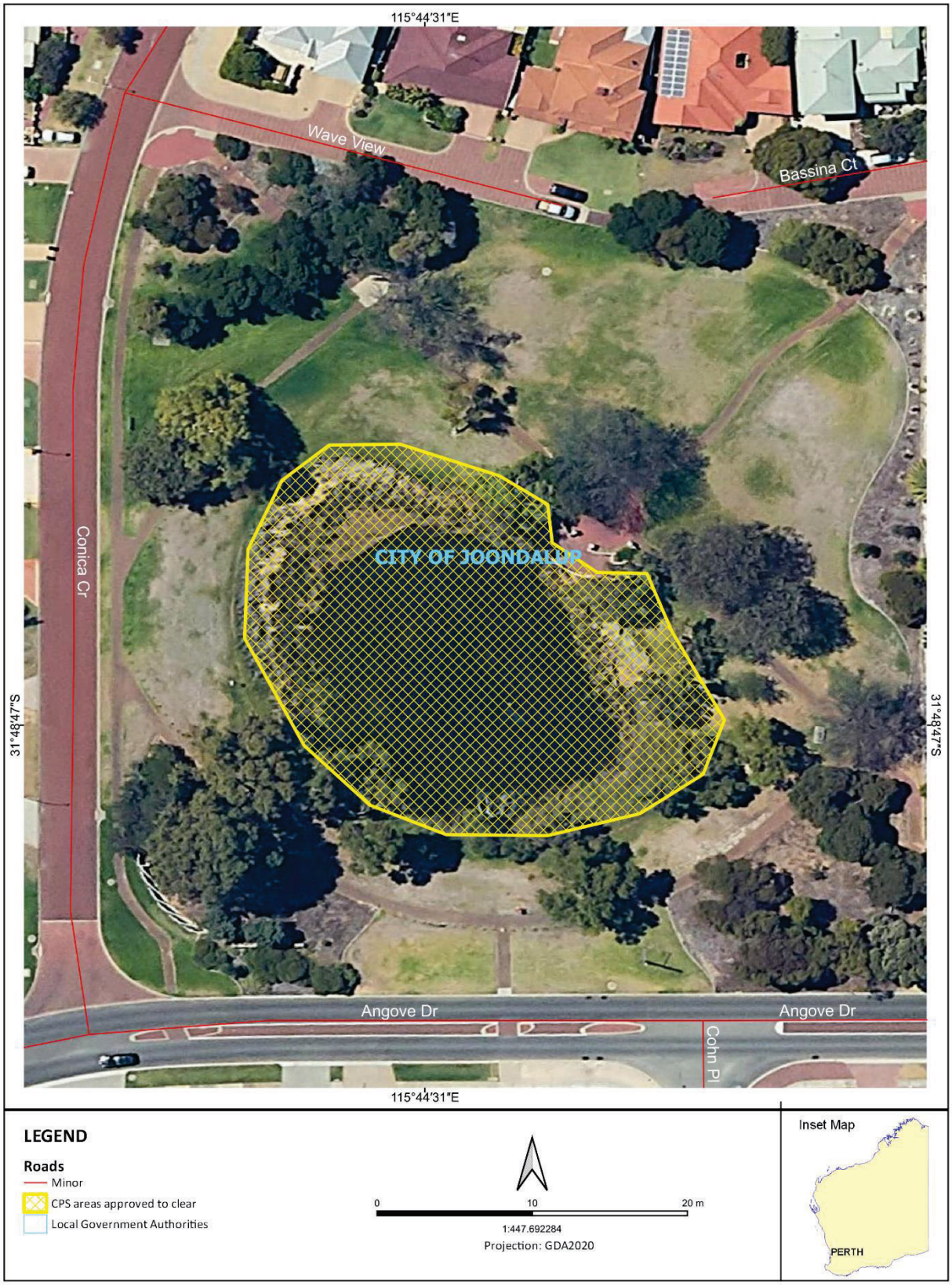


Figure 4: CPS 10738/1 areas approved to clear

Figure 5: CPS 10738/1 areas approved to clear

Figure 6: CPS 10738/1 areas approved to clear

Figure 7: CPS 10738/1 areas approved to clear

Figure 8: CPS 10738/1 areas approved to clear

Figure 9: CPS 1078/1 areas approved to clear

Figure 10: CPS 10738/1 areas approved to clear

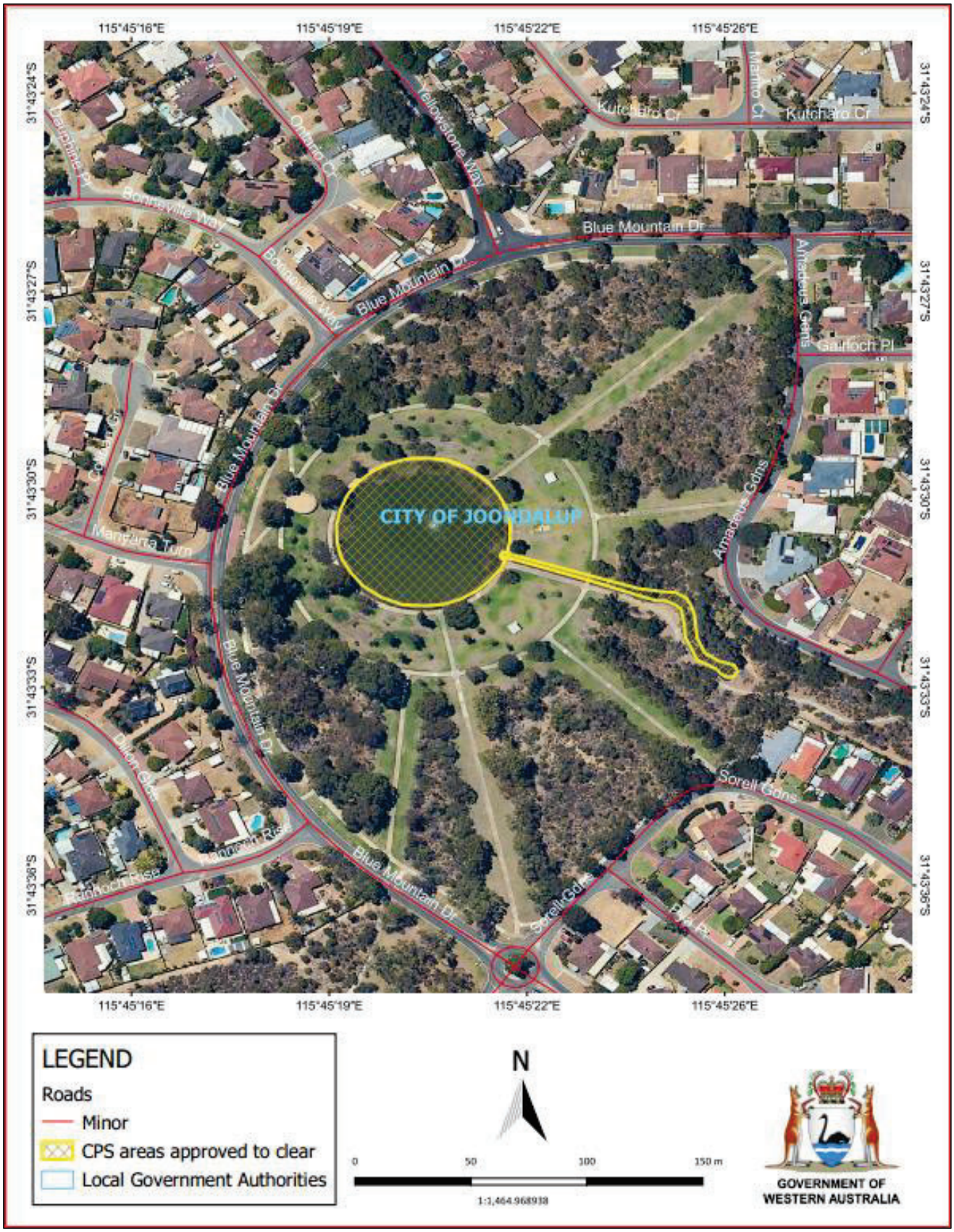


Figure 11: CPS 10738/1 areas approved to clear

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10738/1
Permit type:	Purpose permit
Applicant name:	City of Joondalup
Application received:	20 September 2024
Application area:	4.18 hectares of native vegetation
Purpose of clearing:	Managing and controlling the spread of *Typha* species
Method of clearing:	Mechanical, chemical and hand
Property:	List of properties (Refer to Appendix A)
Location (LGA area/s):	City of Joondalup
Localities (suburb/s):	Joondalup, Iluka, Ocean Reef, Mullaloo, Hillarys and Sorrento

1.2. Description of clearing activities

The vegetation proposed to be cleared is spread across 13 artificial wetlands within the City of Joondalup (see Figures 1-7 in Section 1.5). The application is to selectively clear up to 4.18 hectares of the two native *Typha* species; *Typha orientalis* and *Typha domingensis,* within a 10.46 hectare development envelope to allow for continuous water flow and native rehabilitation where suited.

The clearing will involve a mix of cutting/pruning during hand removal, mechanical removal including cutting, ripping and slashing and chemical application by licensed professionals, which will be applied in dry conditions only, consistent with best practice methods. Both species are capable of aggressive invasion that can transform wetland ecosystems unless actively managed.

1.3. Decision on application

Decision:	Granted
Decision date:	22 November 2024
Decision area:	4.18 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 B), relevant GIS datasets (see Appendix F.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 clearing is to manage and control the spread of invasive Typha species affecting the functionality of wetlands and waterways.

The assessment identified that the proposed clearing may result in:

- potential disturbance of 4.18 ha of native vegetation that is suitable habitat for *Botaurus poiciloptilus* (Australasian bittern - Endangered)
- potential disturbance of 4.18 ha of native vegetation that is suitable breeding habitat for *Oxyura australis* (the Blue billed duck- Priority 4)
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its associated 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 can be minimised and managed to unlikely lead to appreciable land degradation or significant impacts to conservation significant fauna and flora. The applicant has suitably demonstrated avoidance and minimisation measures.

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
- undertake slow, progressive one directional clearing to allow 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 not able to escape to adjacent habitat, the City of Joondalup is to cease works until the identified fauna has been translocated; and
- chemical spraying to be undertaken during the driest period of the year when the water level is at its lowest and during calm conditions, to minimise chemical impacts to the wetland systems.

1.5. Site map(s)

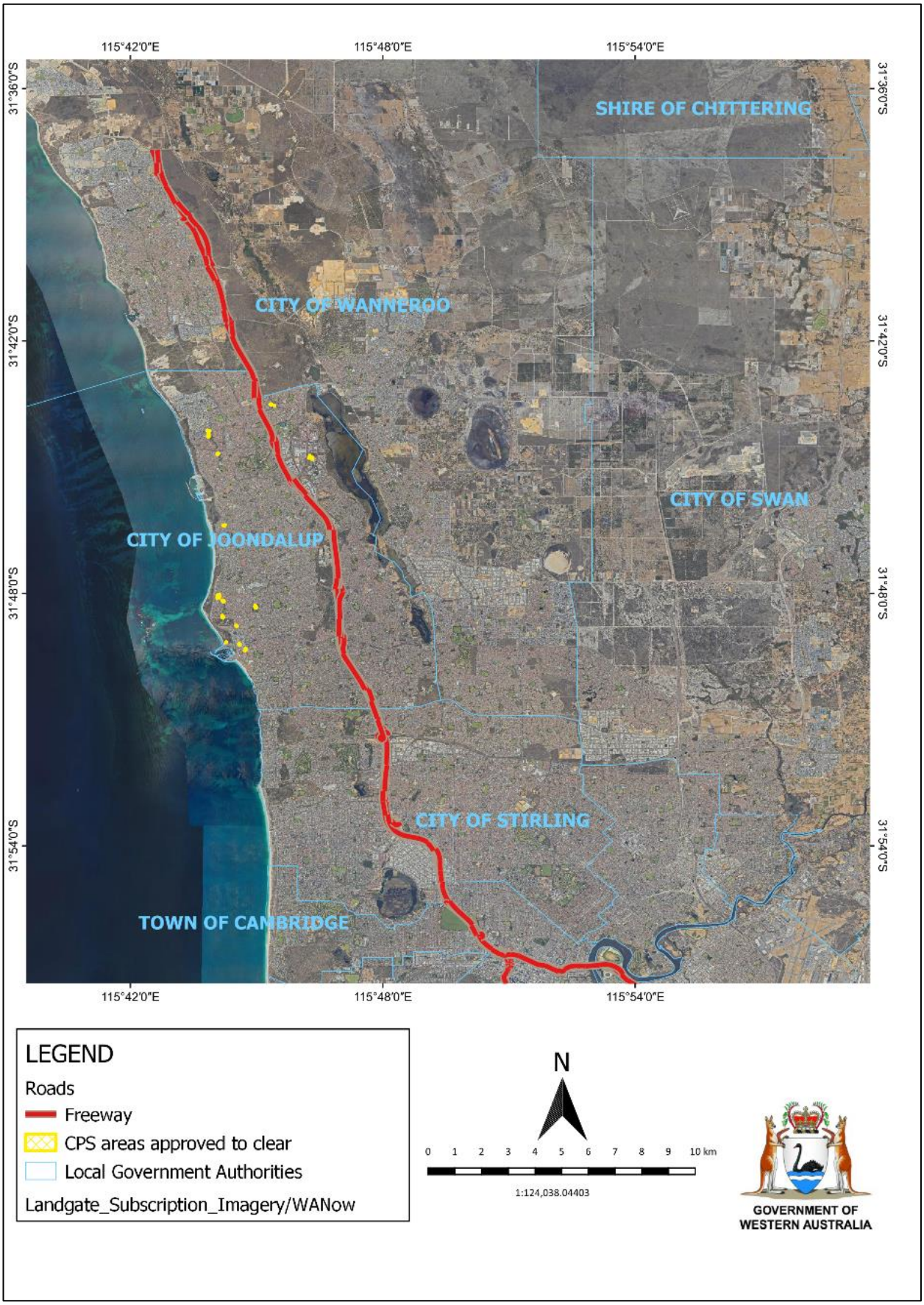


Figure 1: Context Map of the thirteen (13) application areas - The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

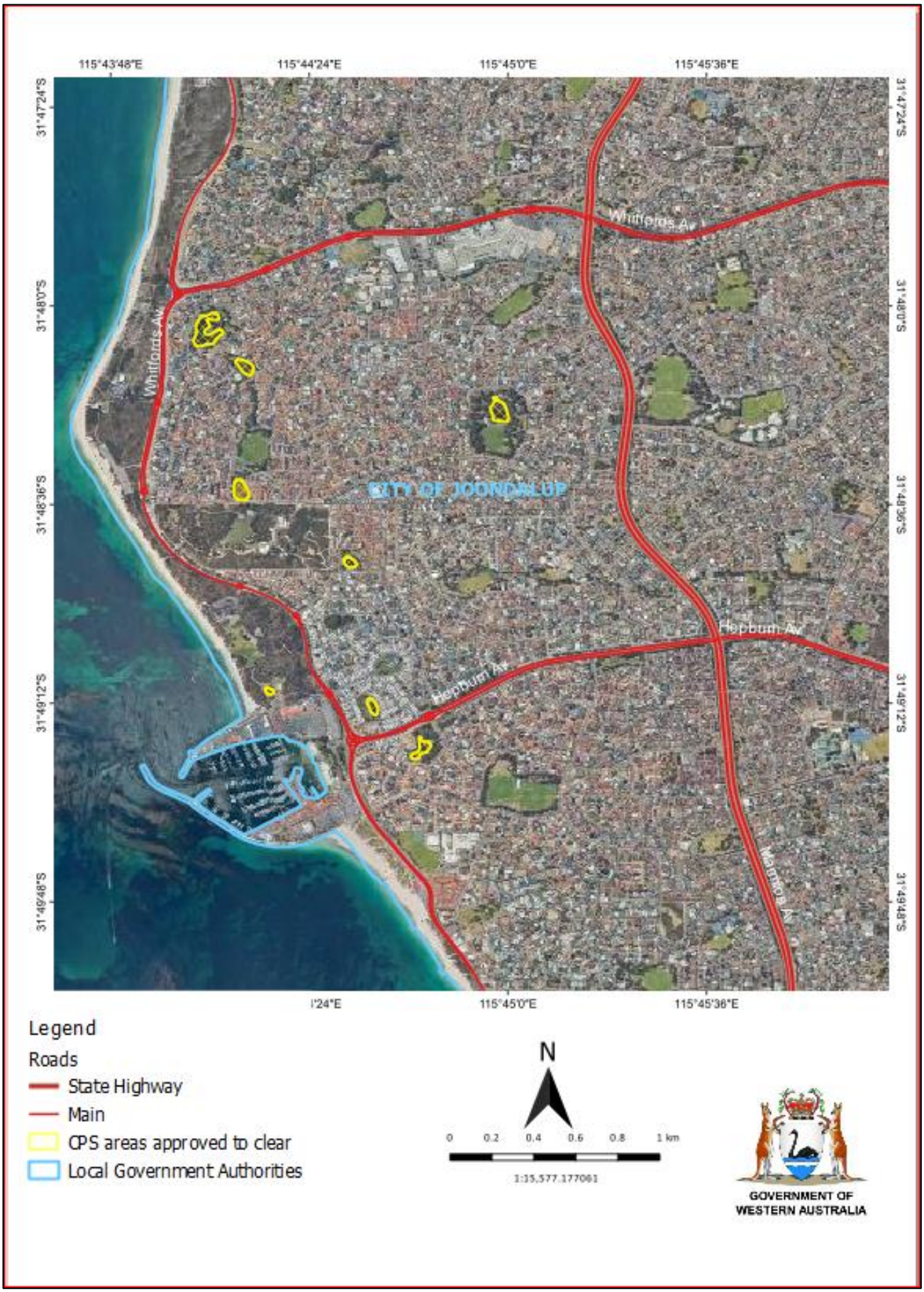


Figure 2: CPS 10738/1 application areas

Figure 3: CPS 10738/1 application areas

Figure 4: CPS 10738/1 application areas

Figure 5: CPS 10738/1 application areas

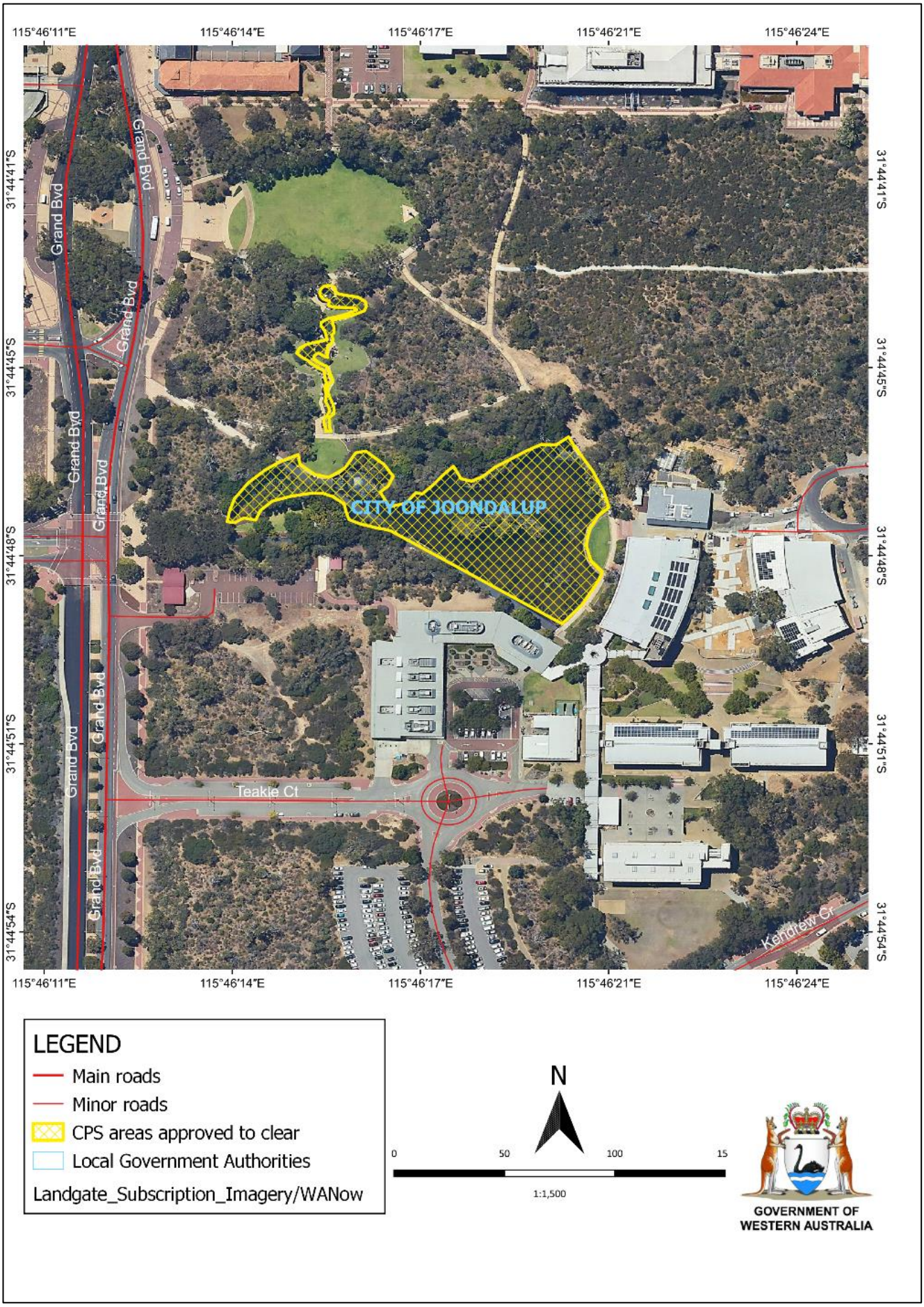


Figure 6: CPS 10738/1 application areas

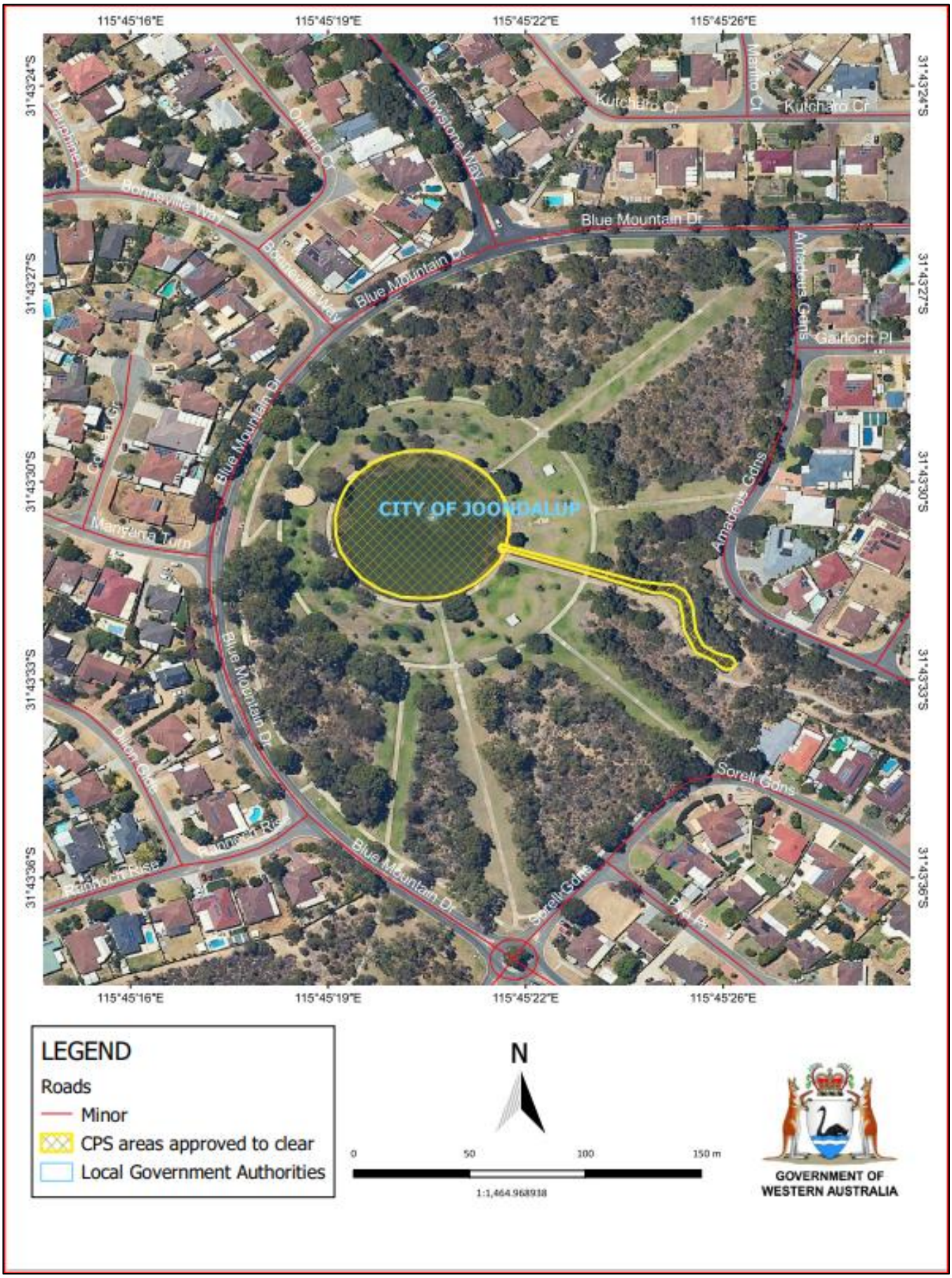


Figure 7: CPS 10738/1 application areas

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)

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

Evidence was submitted by the applicant (Plates 1-21), demonstrating that only *Typha orientalis* and *Typha domingensis* would be cleared in accordance with the City's Pathogen Hygiene Procedure.

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 B) 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 datasets no conservation significant fauna are recorded within any of the 13 application areas, however 43 species are recorded in the local area (10 kms). The closest three conservation significant fauna to the proposed clearing are *Calyptorhynchus latirostris (*Carnaby's black cockatoo) 23 m, followed by *Thalasseus bergii* (Crested tern) 80 m and *Pandion haliaetus* (Osprey) has been recorded 165 m from the proposed clearing.

Black cockatoos do not utilise Typha or other sedges as foraging, nesting or roosting habitat. The Crested Tern is migratory and unlikely to be reliant upon Typha. The Osprey is a medium-sized fish-eating raptor usually associated with coastal habitat and terrestrial wetlands, mostly in coastal areas but occasionally travels inland along major rivers. Typha is unlikely to be critical habitat.

Terrestrial fauna

Chuditch

Chuditch (*Dasyurus geoffroii* – Vulnerable) are carnivorous marsupials restricted to the southwest of WA, typically associated with a range of habitats including jarrah forests, eucalypt woodlands, mallee shrublands and heathland; riparian vegetation may hold higher densities; they require den resources (e.g. tree hollows, hollow logs, burrows or rock crevices); they are also opportunistic feeders and forage on insects and, large invertebrates, as well as seeds, fruits, flowers, and some small mammals, birds and lizards (DCCEEW, 2021). There are 11 historical records all dating back to 1974 in the local area, with the closest record 1.2 kilometres from the application areas. Given the historical sighting date and no records in the past 50 years, this species is unlikely to persist in the local area. While often found in higher densities in riparian vegetation they are not associated with Typha and so given the targeted nature of the proposed clearing, the chuditch is unlikely to be impacted.

Quenda

Isoodon fusciventer (Quenda) are ground-dwelling marsupials, typically associated with forest or woodlands near watercourses, where understorey consists of dense scrub and leaf litter is abundant. The Quenda is a Priority 4 species with 233 records in the local area. They are often found in swampy vegetation with a dense cover up to 1 metre high and have home ranges of 1-3 hectares for females and 2-7 hectares for males (DEC, 2012d). While this species is not directly associated with Typha, they were recorded as recently as April 2024 in the local area so this species Is likely to be present within the application areas. Given that the 13 proposed clearing areas are small and only Typha species is being removed, it is unlikely to represent significant habitat for this species. Fauna management conditions including directional clearing will ensure minimal impacts to individuals if found present during the time of clearing.

Other terrestrial species

*Phascogale tapoatafa wambenger (*south-western brush-tailed phascogale*)* are primarily arboreal, Specially Protected - Conservation Dependent (previously critically endangered) species (DEC, 2012a). *Neelaps calonotos* (black-striped burrowing snake) is a poorly known priority 3 species often found in Banksia woodlands burrowing under the sandy soils (ALA, 2018). The closest record is 704m away but this species has not been sighted since 1964. Given that the proposed clearing will only involve the clearing of Typha, the proposed clearing is unlikely to impact on the habitat of these two species.

Notamacropus Irma (the western brush wallaby - Priority 4) was common in WA in the past, but its population has reduced significantly due to agricultural development. Their preferred habitat is associated with open, seasonally wet flats with low grasses and open scrubby thickets (DEC, 2012c). There are 5 records of this species in the local area, with the closest record is mapped approximately 745 metres from the application area. However, given the limited number of records and the targeted clearing of only Typha species, it is unlikely the proposed clearing will significantly impact the habitat of this species.

Aquatic species

Water-rat, rakali

Hydromys chrysogaster (Water-rat, rakali) is a Priority 4 species with 21 records in the local area, the closest record of a rakali is 1.2km from the proposed clearing areas in Lake Joondalup in 2014. Rakali are amphibious or semiaquatic mammals reaching up to 70 centimetres in length (from nose to end of the tail) and inhabit various permanent freshwater aquatic habitats. They are predominantly carnivorous, 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 and nest in bankside hollow logs but can utilise artificial nests. Intact riparian vegetation and associated bank stability is critical to their survival (DWER, 2021). While not present in any of the 13 wetland application areas, they may range through the application areas as ranging territory can be up to 4 kilometres of a riverbank (DWER, 2021).

The clearing activities may impact on the stability of the riverbank and subsequently impact on the rakali habitat. However, considering the small extent of clearing area, the existence of similar or higher quality habitat in adjacent remnant vegetation along the river, and the applicant's commitments on mitigation measures, it is unlikely the proposed clearing will significantly impact the habitat of this species.

Bird species

The application areas may provide habitat for the following 19 migratory bird species (please see table below). These species do not depend exclusively on foraging in habitats prone to Typha infestation, however, they may be present at the time of clearing.

	Scientific name	Migratory bird common name
1	*Limosa lapponica*	bar-tailed godwit
2	*Limosa limosa*	black-tailed godwit
3	*Onychoprion anaethetus*	bridled tern
4	*Tringa nebularia*	common greenshank
5	*Actitis hypoleucos*	common sandpiper
6	*Thalasseus bergii*	crested tern
7	*Apus pacificus*	fork-tailed swift
8	*Plegadis falcinellus*	glossy ibis
9	*Calidris subminuta*	long-toed stint
10	*Tringa stagnatilis*	marsh sandpiper
11	*Pandion haliaetus*	osprey
12	*Calidris ruficollis*	red-necked stint
13	*Sterna dougallii*	roseate tern
14	*Calidris acuminata*	sharp-tailed sandpiper
15	*Macronectes giganteus*	southern giant petrel
16	*Ardenna pacifica*	wedge-tailed shearwater
17	*Chlidonias leucopterus*	white-winged black tern
18	*Oceanites oceanicus*	Wilson's storm-petrel
19	*Tringa glareola*	wood sandpiper

Australasian Bittern

Botaurus poiciloptilus (Australasian bittern) is an endangered species with 11 records in the local area, most recently recorded in 1991 approximately 1.6km from the proposed clearing areas. This species is associated with freshwater wetlands, occasionally in estuaries or tidal wetlands; favours tall dense vegetation, dominated by sedges, rushes and reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus) or cutting grass (Gahnia) growing over a muddy or peaty substrate; forages on small fish, frogs, freshwater crayfish, spiders, insects and small reptiles; nests October to February adjacent to relatively deep, densely vegetated freshwater swamps and pools, building its nests under dense cover over shallow water (DCCEEW, 2021). The 13 application areas are within the current range of Australasian bittern, therefore the proposed clearing may potentially impact this endangered species. Permit conditions to undertake pre-clearing site inspections prior to works commencing and ongoing during works to allow fauna to move into adjacent vegetation, and the translocation of fauna if they do not disperse on their own, would mitigate potential impacts to this species. The applicant will be required to obtain an authorisation from the Minister for Environment under section 40 of the *Biodiversity Conservation Act 2016* obtained from the Department of Biodiversity, Conservation and Attractions (DBCA) for the translocation of any threatened fauna species.

Australian Little Bittern

Ixobrychus dubius (Australian Little Bittern) is a Priority 4 species with 10 records in the local area the closet mapped is 4km from the proposed clearing. This species has similar habitat requirements to the Australasian bittern (described above) mainly where tall rushes, reeds, Typha, shrub thickets or other dense cover is inundated by at least 30 centimetres of water. It can be found in extensive swamps, but often inhabits small patches of dense wetland vegetation such as Typha along drains or in small urban lakes (Bird life Australia, 2020a). The Australian Little Bittern can occur as a migrant in south-west Australia from late August to early April, breeding in the north of the state in winter. Little bittern may visit wetlands on the Swan Coastal Plain (DBCA, 2021). There is a possibility of the species occurring within the application areas but the proposed Typha clearing is unlikely to have significant impacts on the

Australian Little Bittern. Permit conditions to undertake pre-clearing site inspections prior to works commencing and ongoing during works to allow fauna to move into adjacent vegetation, and the translocation of fauna if they do not disperse on their own, would mitigate potential impacts to this species.

Black Bittern- southwest subpopulation

The Priority 2 (formerly P3) *Ixobrychus flavicollis australis* (Black Bittern- southwest subpopulation) has been recorded once in the local area in 1987. In spring, this species builds a nest on branches overhanging water. Habitat includes terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangrove (Birdlife Australia, 2020b). Given that Black bittern are not dependent on Typha habitat for breeding, it is unlikely this species will be impacted significant by the proposed clearing.

Blue-billed duck

Oxyura australis (Blue-billed duck) is a Priority 4 species with 181 records in the local area. This species inhabits deep, freshwater swamps with dense vegetation including Typha species; occasionally found in large rivers, coastal swamps and saline water bodies. This species is almost entirely aquatic; associated in large flocks during autumn to winter and forage by sifting mud and water on invertebrates, seeds, buds and fruit.

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, 2020c). Therefore, the proposed Typha clearing may impact the breeding habitat of this species. Permit conditions to undertake pre-clearing site inspections prior to works commencing and ongoing during works to allow fauna to move into adjacent vegetation, and the translocation of fauna if they do not disperse on their own, would mitigate impacts to this species.

Principle A Conclusion

Typha is capable of aggressive invasions that can transform ecosystems unless it is actively managed (Western Australian Herbarium 1998-). Without management, Typha can develop quickly into a monoculture and cover an entire water body. As the proposed clearing will only target Typha, it is unlikely any conservation significant flora will be negatively impacted during removal, due to the nature of the clearing.

Based on the above assessment, the proposed clearing is unlikely to result in a significant loss in biodiversity or impact significant populations of threatened and priority flora. Suitable habitat for species listed in Appendix B.1 is unlikely to be significantly impacted by the proposed clearing.

Principle B Conclusion

Based on the above assessment, stands of Typha may provide breeding habitat and a source of nest building material for the Australasian bittern (Endangered) and the Blue billed duck (P4). There is a low probability that migratory or wetland birds may temporarily use the application area as foraging habitat. While the other riparian associated fauna may range through the application area, they are unlikely to be significantly impacted by the proposed clearing. It is considered that the impacts of the proposed clearing can be managed via permit conditions.

Recommended Conditions

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

- avoid and minimise clearing, to minimise the direct impacts to native vegetation;
- conduct clearing authorised under this permit in one direction towards adjacent native vegetation;
- 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;
- undertake spraying of herbicide during the driest period of the year when the water level is at its lowest and during calm conditions; and
- 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) 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 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 riparian vegetation communities and associated wetlands within the application area.

The mapped soil units had a high risk of wind erosion and subsurface acidification in some soil types. 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 wind erosion and subsurface acidification (DBCA, 2019).

The removal of Typha has the potential to increase sedimentation and turbidity in the water within the application area, thereby possibly impacting surface water quality. However these impacts are likely to be temporary and will stabilise post clearing.

Given the invasive nature 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 land and water resources. It is expected to enhance the habitat within the 13 application areas through the removal of Typha as the increased water drainage will 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 or wind and water erosion.

No management conditions are required in relation to these environmental values.

3.3. Relevant planning instruments and other matters

One registered Aboriginal Site and Heritage Place has been mapped within the application areas, Joondalup Waugal Egg. 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.

The application areas on Lot 11576 on Plan 17959; Lot 11575 on Plan 17959 and Lot 14406 on Plan 29812 are within a Priority 3 (P3) area of the Perth Coastal and Gwelup Underground Water Pollution Control Area (UWPCA). This UWPCA is protected under the *Metropolitan Water Supply, Sewerage and Drainage Act, 1909*. The objective of P3 areas is to manage water quality contamination risks so that the drinking water source is maintained for as long as possible. The remaining properties listed are outside of UWPCA and Public Drinking Water Source Areas (PDWSAs).

As herbicide is proposed to 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, 2024). These guidelines include:

- WQPN 4: Sensitive water resources
- WQPN 10: Contaminant spills – emergency response plan
- WQPN 11: Assessing and managing risks in public drinking water source areas
- WQPN 28: Mechanical servicing and workshops
- WQPN 29: Mobile mechanical servicing and cleaning
- WQPN 36: Protecting public drinking water source areas
- WQPN 65: Toxic and hazardous substances
- WQPN 83: Infrastructure corridors near sensitive water resources
- WQPN 84: Rehabilitation of disturbed land in PDWSAs
- PSC 88 – use of herbicides in water catchment areas

End

Appendix A. Property List

Property	Locality
Lot 11576 on Deposited Plan 17959	Joondalup
Oahu Gardens Road Reserve (PIN 11487178)	Sorrento
Lot 14406 on Deposited Plan 29812	Joondalup
Lot 10446 on Deposited Plan 215799	Hillarys
Lot 13364 on Deposited Plan 220258	Sorrento
Lot 12290 on Diagram 83892	Hillarys
Lot 500 on Deposited Plan 417015	Hillarys
Lot 12518 on Plan 20963	Hillarys
Lot 11575 on Plan 17959	Joondalup
Lot 13365 on Deposited Plan 220258	Sorrento
Lot 459 on Deposited Plan 51290	Hillarys
Lot 12032 on Plan 18934	Hillarys
Lot 14466 on Deposited Plan 31007	Iluka
Lot 12033 on Plan 18934	Hillarys
Lot 12271 on Diagram 83892	Hillarys
Lot 12289 on Plan 19491	Hillarys
Lot 11866 on Plan 18562	Ocean Reef
Lot 12260 on Plan 14912	Mullaloo

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	The area proposed to be cleared is up to 4.18 hectares of *Typha orientalis* and *Typha domingensis* along 13 artificial wetlands in the City of Joondalup area within a 10.46 ha development envelope in the intensive land use zone of Western Australia. Aerial imagery indicates the local area (10 kilometre radius from the centre of the areas proposed to be cleared) retains 21.32 per cent of the original native vegetation cover.
Ecological linkage	The application areas do not form part of any regional ecological linkage. The proposed clearing of the application areas will not sever or severely impact the function of an ecological linkage.
Conservation areas	One of the 13 proposed clearing areas is within Bush Forever site number 325.
Vegetation description	Photographs supplied by the applicant indicate the vegetation within the 13 proposed clearing areas consists of two invasive, native *Typha* species; *Typha orientalis* and *Typha domingensis.* Representative photos are available in Appendix E.

Characteristic	Details
	Swan Coastal Plain vegetation complexes as described and mapped by Heddle *et al.* (1980) as updated by Webb *et al.* (2016) within the application areas include: • **Cottesloe Complex-Central and South 52** which is described as: *Mosaic of woodland of Eucalyptus gomphocephala (Tuart) and open forest of Eucalyptus gomphocephala (Tuart) - Eucalyptus marginata (Jarrah) - Corymbia calophylla (Marri); closed heath on the Limestone outcrops.* • **Quindalup Complex 55** 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 Melaleuca lanceolata (Rottnest Teatree) - Callitris preissii (Rottnest Island Pine), the closed scrub of Acacia rostellifera (Summer-scented Wattle) and the low closed Agonis flexuosa (Peppermint) forest of Geographe Bay.* The mapped vegetation types retain 21.32 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Aerial imagery and photographs supplied by the applicant indicate the vegetation within the 13 proposed clearing areas is in a completely degraded to good (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photos are available in Appendix E.
Climate and landform	The climate is classified as Mediterranean, with dry, hot summers and cool, wet winters (BOM, 2023). • The application area is within the Central Coast rainfall district and the average rainfall is 740 mm per year, with the majority falling between May and August • average maximum temperature ranges from 18.5°C in July to 31.7°C in February (BoM, 2024) • average minimum temperature ranges from 8.1°C in July and August to 17.6°C in February (BoM, 2024) The landforms are mapped as: • Quindalup South System (the majority) described as '*Coastal dunes, of the Swan Coastal Plain, with calcareous deep sands and yellow sands. Coastal scrub*' and; • Spearwood System which are described as *'Sand dunes and plains. Yellow deep sands, pale deep sands and yellow/brown shallow sands'.*
Soil description	The soils are mapped as: • Quindalup South third dune Phase (the majority) • Karrakatta Sand Yellow Phase (second most common) • Karrakatta shallow soils Phase • Quindalup South youngest dune Phase
Land degradation risk	The soils mapped within the application area are mapped as having a high to extreme risk of wind and water erosion (DPIRD, 2024).
Waterbodies	The desktop assessment indicated that the application areas intersect two consanguineous wetland suites; #25 and #51.
Hydrogeography	Groundwater salinity is mapped at 500-1000 TDS (DPIRD, 2024). No CAWS Act or RIWI Act areas.
Flora	No priority or threatened flora are mapped within the proposed clearing areas.

Characteristic	Details
	A total of 7 priority listed species were recorded within the local area (10kms): *Leucopogon maritimus* (P1) *Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)* (P1) *Acacia benthamii* (P2) *Conostylis bracteata* (P3) *Pimelea calcicola* (P3) *Jacksonia sericea* (P4) and *Eucalyptus foecunda subsp. Foecunda* (P4) None of the above species are described in association with Typha.
Ecological communities	7 Priority and Threatened Ecological Communities are recorded in the local area however only one is recorded within any of the application areas. The Tuart (*Eucalyptus gomphocephala)* woodlands and forests of the Swan Coastal Plain PEC (P3) is mapped within the proposed clearing at Mawson Park in Hillarys (Appendix E, Plate 8). The predominant PEC/TEC in the local area is the Banksia Woodlands of the Swan Coastal Plain PEC (Priority 3) of which the closest record is 1.6kms from the proposed clearing areas.
Fauna	There are 43 conservation significant fauna in the local area, however none were recorded in any of the 13 application areas. The closest three conservation significant fauna recorded are: *Calyptorhynchus latirostris (*Carnaby's black cockatoo) 23m away *Thalasseus bergii* (Crested Tern) 80m away and *Pandion haliaetus* (Osprey) has been recorded 165m away.

B.2 Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	38.45
Vegetation complex					
Cottesloe Complex-Central and South	45,299.61	14,567.87	32.16	6,606.12	14.58
Quindalup Complex	54,573.87	33,011.64	60.49	5,994.64	10.98
Local area calculation					
12km radius	35,331.50	7,532.66	21.32	-	-

B.3 Land degradation risk table

Risk categories	
Wind erosion	H1: 50-70% of map unit has a high to extreme wind erosion risk
Water erosion	H2: >70% of map unit has a high to extreme water erosion risk
Salinity	L1: <3% of map unit has a moderate to high salinity risk or is presently saline
Subsurface Acidification	L1: <3% of map unit has a high subsurface acidification risk or is presently acid
Flood risk	L1: <3% of the map unit has a moderate to high flood risk
Water logging	L1: <3% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	L2: 3-10% of map unit has a high to extreme phosphorus export risk And M2: 30-50% of map unit has a high to extreme phosphorus export risk

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The 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	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
body. Given the application areas comprise 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 areas may contain suitable habitat and soils for a number of conservation significant fauna and flora species, and one application area (Mawson Park in Hillarys) is mapped as the Priority 3 (P3) Tuart Woodlands of the Swan Coastal Plain priority ecological community (PEC). The approved conservation advice states Typha species *"may be found in the ecological community"* (DCCEEW, 2019). However no Tuart trees are being cleared, only Typha infestations, so impacts to the PEC and conservation significant fauna and flora species are unlikely to be significant.		
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared may contain foraging, roosting and breeding habitat for conservation significant fauna.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared does not contain suitable habitat for threatened flora species listed under the BC Act.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The areas proposed to be cleared are not likely to impact any threatened ecological communities.	Not likely to be at variance	No.
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the native vegetation in the local area (approximately *21.32 per cent)* is consistent with the 10 per cent national objectives and targets for biodiversity conservation in Australia due to the location in a constrained area of the Swan Coastal Plain. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not likely to be at variance	No.
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: A portion of one of the application areas falls within Bush Forever site 325. Given the purpose of the proposed clearing is to improve water flow and for potential native rehabilitation, it is not likely to have an impact on the environmental values of this conservation area.	Not likely to be at variance	No.

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: All of the application areas are within artificial wetlands. Typha forms a natural component of wetland and watercourse vegetation. However, Typha can develop quickly into a monoculture and dominate wetland ecosystems. Given the targeted nature of the proposed clearing, it is unlikely to significantly impact the wetlands.	At variance	*No*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The two mapped soil types are highly susceptible to wind and water erosion risk. However, the clearing methods and targeted nature of the proposed clearing, is unlikely to result in appreciable land degradation.	Not likely to be at variance	*No*
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given the 13 application areas intersect are wetlands and Typha is a riparian species, the proposed clearing may have temporary impacts on surface or ground water quality.	May be at variance	Yes *Refer to Section 3.2.3, above*
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The purpose of the clearing permit is to remove Typha to increase water flow which is likely to reduce the likelihood, incidence and intensity of flooding in the local area.	Not likely to be at variance	Yes *Refer to Section 3.2.3, above.*

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.

Condition	Description
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. Photographs of the vegetation

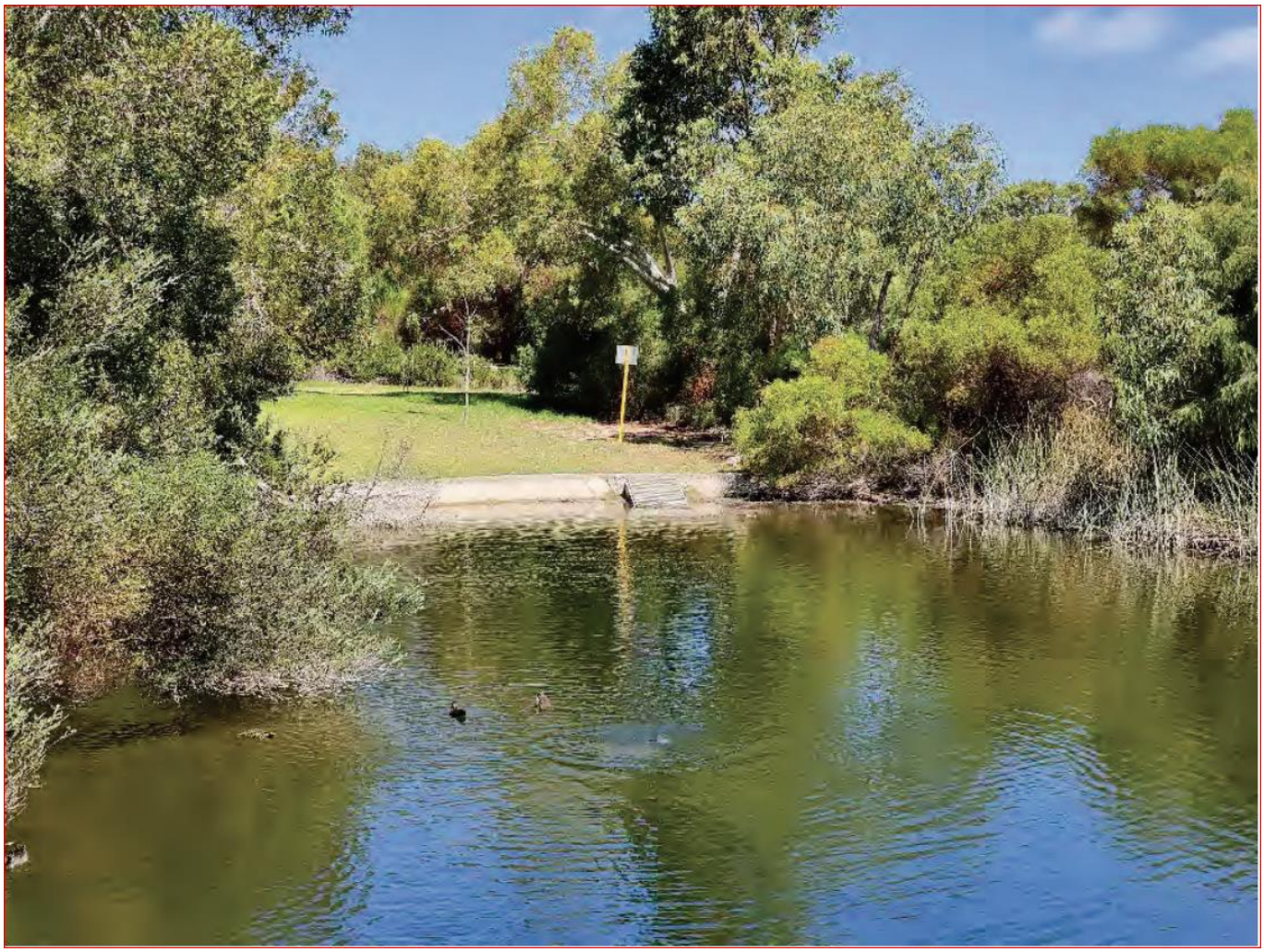


Plate 1: Beaumaris Park Lake in Ocean Reef

Plate 2: Blue Lake Park in Joondalup

Plate 3: Broadbeach Park in Hillarys

Plate 4: Central Park main lake in Joondalup

Plate 5: Conica Park Lake in Hillarys

Plate 6: Flinders Park south lake in Hillarys

Plate 7: Lacepede Park in Sorrento

Plate 8: Mawson Park in Hillarys

Plate 9: Oahu Park in Hillarys

Plate 10: Sir James McCusker Park in Iluka

Plate 11: Hillarys Marina Lake (Whitfords Nodes) in Hillarys

Plate 12: Wolinski Park in Mullaloo

Appendix F. Sources of information

F.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

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)

F.2. References

City of Joondalup (2024) *Clearing permit application CPS 10738/1*, received 28 August 2024 (DWER Ref: 998296).

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2021). *Species Profile and Threats Database, Dasyurus geoffroii*. Available from: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=330\

Department of the Environment and Energy (2019). *Approved Conservation Advice (incorporating listing advice) for the Tuart* (Eucalyptus gomphocephala) *woodlands and forests of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf.

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed 7 November 2024).

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Department of Water and Environmental Regulation (DWER) (Regulatory Services – Water) (2024) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 10738/1* received 18 October 2024

Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, https://catalogue.data.wa.gov.au/dataset/dbca

Department of Water and Environmental Regulation (DWER) (2021) Available from: https://rivers.dwer.wa.gov.au/species/hydromys-chrysogaster/ (accessed 6 November 2024)

Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia.* Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.

Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.

Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and output*s Resource Management Technical Report No. 280. Department of Agriculture.

Shah, B. (2006) *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 4 November 2024)