



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 10056/1
File Number: DWERVT11902
Duration of Permit: From 22 June 2023 to 22 June 2030

PERMIT HOLDER

City of Bayswater

LAND ON WHICH CLEARING IS TO BE DONE

Lot 14235 on Deposited Plan 27395, Maylands

AUTHORISED ACTIVITY

The permit holder must not clear more than 0.6 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 22 June 2025.

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

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

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

3. Weed and dieback management

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

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

4. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner towards adjacent *native vegetation*, to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

5. 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 5(a), works must cease until the fauna have escaped into adjacent habitat ahead of the clearing activity or translocated into adjacent *native vegetation*.

6. Mitigation – revegetation and rehabilitation requirements

Within 24 months of the commencement of clearing, the permit holder must implement and adhere to the ‘Berringa Park Wetlands Conservation Plan 2020-2030’ (Natural Area, 2020), including but not limited to the following actions;

- (a) commence *revegetating* and *rehabilitating* the area cross-hatched yellow on Figure 1 of Schedule 1, by way of:
 - (i) deliberately *planting* tube stock and salvaged *native vegetation*; and
 - (ii) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area.
- (b) implement hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the site;
- (c) establish no less than three 5 x 5 metre quadrat monitoring sites within the *revegetated* and *rehabilitated* areas;
- (d) engage an *environmental specialist* to monitor quadrats as specified in condition 6(c) to ensure *revegetation* is achieving the desired outcomes within the ‘Berringa Park Wetlands Conservation Plan 2020-2030’ (Natural Area, 2020).
- (e) Where monitoring undertaken in accordance with condition 6(d) identifies that the *revegetation* is not meeting the outcomes within the ‘Berringa Park Wetlands Conservation Plan 2020-2030’ (Natural Area, 2020), the permit holder is to repeat steps required under condition 6(a)-(d).

7. Records that must be kept

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

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the direction of clearing; (e) the size of the area cleared (in hectares); (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 2; (g) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 3; and (h) fauna management actions undertaken in accordance with condition 5.
2.	In relation to the <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 6	<ul style="list-style-type: none"> (a) size of the area <i>revegetated</i> and <i>rehabilitated</i>; (b) the date(s) on which the area <i>revegetation</i> and <i>rehabilitation</i> was undertaken; (c) the boundaries of the area <i>revegetated</i> and <i>rehabilitated</i> (recorded digitally as a shapefile); (d) description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken, including actions taken to implement hygiene protocols and weed control; (e) a copy of the <i>environmental specialist's</i> monitoring report; (f) any remedial actions required to be undertaken.

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 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.
fill	means material used to increase the ground level, or to fill a depression.
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.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the CEO as a suitable environmental specialist.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
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.
planting	means the re-establishment of vegetation by creating soil conditions and planting seedlings of the desired species
revegetate/ed/ing/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
Rehabilitate/ed/ing/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or

Term	Definition
	(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*

29 May 2023

SCHEDULE 1

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



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



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10056/1
Permit type:	Area permit
Applicant name:	City of Bayswater
Application received:	25 January 2023
Application area:	0.6 hectares of native vegetation
Purpose of clearing:	Removal of weed species to revegetate with native plants
Method of clearing:	Mechanical and brush cutting
Property:	Lot 14235 on Deposited Plan 27395
Location (LGA area/s):	City of Bayswater
Localities (suburb/s):	Maylands

1.2. Description of clearing activities

The City of Bayswater is proposing to clear 0.6 hectares of native vegetation (comprising of mostly *Typha orientalis*) at Mary Street Maylands reserve also known as Berringa Park Wetlands, Lot 14235 on Deposited Plan 27395. The proposed clearing will facilitate the removal of existing weed species and the planting of native vegetation within the completely degraded area. The vegetation proposed to be cleared is contained within a single continuous area (see Figure 1 and 2, Section 1.5). Clearing will be undertaken by mechanical means and then constant brush cutting while revegetation occurs.

1.3. Decision on application

Decision:	Granted
Decision date:	29 May 2023
Decision area:	0.6 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

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

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1), the findings of a flora and fauna survey and a conservation plan (see 0), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the purpose of the clearing is for improving the overall quality of the area.

The assessment identified that the proposed clearing will result in:

- the loss of a highly degraded part of the subtropical and temperate coastal saltmarsh, a potential threatened ecological community (TEC)
- the loss of native vegetation that is a suitable nesting area for the Blue billed duck (*Oxyura australis*)
- occurs in an area that has been extensively cleared
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation or significant impacts to the blue billed duck or the TEC. The area will be revegetated following weed management, which will minimise impacts of further clearing within an extensively cleared landscape and improve the occurrence of the TEC.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- in areas comprising dense stands of Typha, each potential Blue billed duck nesting area identified must be inspected before clearing can occur. If breeding Blue billed duck is detected, clearing cannot occur within that portion of the application area until the chicks have fledged.
- undertake slow, progressive one directional clearing to allow terrestrial and avian fauna to move into adjacent habitat ahead of the clearing activity
- adhere to the rehabilitation in the Berringa Park Wetlands Conservation Plan 2020-2030

1.5. Site map



Figure 1 Map 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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Soil and Land Conservation Act 1945* (WA)

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant advised that the area would be revegetated according to the Beringa Park Wetlands Conservation Plan 2020-2030 prepared by Natural Area (2020), with a mixture of native species after the clearing has taken place depending on the mapped planting area (City of Bayswater, 2023). Three planting areas were mapped in the application area, wetland brackish, wetland understorey and wetland understorey and canopy (Table 1). The provisions of the Conservation Plan are as follows:

Implementation of Revegetation

- Timeframe:
 - Clearing and initial weed control will occur in July and August 2028 with follow up in November
 - Planting will occur in June 2029 and general maintenance will occur in October and April the following years
- Weed control:
 - The weeds will be removed through manual by machine or hand, chemical by application of glyphosate, fusillade forte or Metsulfuron depending on the species.
 - Best practice application methods of chemical treatment includes not spraying over standing water, use lowest possible spray pressure, not spraying in windy conditions or if rainfall is forecast as per label recommendations
 - General weed control activities will be undertaken each year following the completion of revegetation works
- Plant installation:
 - Planting density for overstorey species is recommended to be 1 plant per 10 square meters and understorey species at one plant per square meter, the planting species and densities are provided in Table 1.

No hygiene considerations or completion criteria were mentioned in the Conservation Plan (Natural Area, 2020).

Table 1: Native species to be planted according to planting area

Planting area	Species name	Species composition
Wetland brackish	<i>Frankenia pauciflora</i>	10
	<i>Gahnia trifida</i>	5
	<i>Juncus kraussii</i>	20
	<i>Myoporum caprarioides</i>	5
	<i>Samolus repens</i>	10
	<i>Tecticornia lepidosperma</i>	10
	<i>Tecticornia halocnemoides</i>	10
	<i>Tecticornia indica</i> subsp. <i>bidens</i>	15

Planting area	Species name	Species composition
	<i>Salicornia quinqueflora</i>	15
Wetland understorey	<i>Astartea scoparia</i>	5
	<i>Baumea juncea</i>	15
	<i>Carex fascicularis</i>	15
	<i>Carex tereticaulis</i>	15
	<i>Centella asiatica</i>	15
	<i>Hakea varia</i>	5
	<i>Hypocalymma angustifolium</i>	5
	<i>Melaleuca lateritia</i>	5
	<i>Melaleuca teretifolia</i>	5
	<i>Pericalymma ellipticum</i>	5
	<i>Pteridium esculentum</i>	5
	<i>Taxandria linearifolia</i>	5
	Wetland understorey and Canopy	<i>Astartea scoparia</i>
<i>Banksia littoralis</i>		3
<i>Baumea articulata</i>		7
<i>Baumea juncea</i>		8
<i>Baumea preissii</i>		8
<i>Baumea rubiginosa</i>		8
<i>Carex fascicularis</i>		7
<i>Carex tereticaulis</i>		7
<i>Centella asiatica</i>		8
<i>Centella asiatica</i>		8
<i>Eucalyptus rudis</i>		3
<i>Gahnia decomposita</i>		7
<i>Gastrolobium ebracteolatum</i>		3
<i>Melaleuca raphiophylla</i>		4
<i>Hakea varia</i>		3
<i>Hypocalymma angustifolium</i>		4
<i>Melaleuca lateritia</i>		3
<i>Melaleuca teretifolia</i>		3
<i>Pericalymma ellipticum</i>		4
<i>Pteridium esculentum</i>		3
<i>Taxandria linearifolia</i>		3

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. The Delegated Officer considered that a condition should be imposed on the clearing permit, requiring the revegetation of the application area proposed by the applicant, to ensure that the mitigation measures proposed are adhered to. It was considered that a condition for hygiene protocols and the addition of standard revegetation condition would be adequate.

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 **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values fauna, adjacent flora and vegetation, significant remnant vegetation and conservation areas, 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 (Ecological community) - Clearing Principles (a and d)

Assessment

A portion of the application area is mapped as the 'Subtropical and Temperate Coastal Saltmarsh' community, listed as a Vulnerable TEC under the EPBC Act and Priority 3 priority ecological community (PEC) by the Department of Biodiversity, Conservation and Attractions (DBCAs). The community consists mainly of salt-tolerant vegetation (halophytes) including grasses, herbs, reeds, sedges and shrubs. Succulent herbs and grasses generally dominate,

and vegetation is generally <0.5m tall with the exception of some reeds and sedges (DSEWPC, 2013). The listed ecological community is limited to areas and patches of coastal saltmarsh that meet the key diagnostic characteristics and condition thresholds. Since the application area is mapped in a 'completely degraded' condition, it does not meet the minimum requirement threshold and is excluded from protection as the ecological community listed under the EPBC Act (DSEWPC, 2013). Whilst the application area may not be protected as being the TEC, the application area can still retain important natural values. Given the application area will be rehabilitated after clearing to remove weeds, this ecological community is part of a conservation plan prepared for the City of Bayswater (Natural Area, 2020).

Conclusion

Based on the above assessment, the proposed clearing will result in clearing of an area that occurs adjacent to an occurrence of a TEC. Given the purpose of the clearing is to remove weeds, including in an area with the native *Typha orientalis* which has an invasive nature and can cause adverse impacts on wetlands in the absence of management (Western Australia Herbarium, 2019), the proposed clearing is likely to reduce long term impacts to the adjacent occurrence of the TEC.

For the reasons set out above, it is considered that the impacts of the proposed clearing on the subtropical and temperate coastal saltmarsh can be managed by the conservation plan (Natural Area, 2020). No additional management actions are required to be imposed on the clearing permit.

3.2.2. Biological values (Fauna) - Clearing Principle (b)

Assessment

According to available databases, 14 conservation significant fauna species associated with water courses, wetlands and coastal habitats have been recorded in the local area, with no records within the application area. These included the blue-billed duck (*Oxyura australis*), Australasian Bittern (*Botaurus poiciloptilus*), Australian little bittern (*Ixobrychus dubius*), Black bittern (*Ixobrychus flavicollis australis* southwest subpop), Australian painted snipe (*Rostratula australis*), Carter's freshwater mussel (*Westralunio carteri*) and the rakali (*Hydromys chrysogaster*). There were seven migratory species that may also utilise the application area, the common sandpiper (*Actitis hypoleucos*), Sharp-tailed sandpiper (*Calidris acuminata*), Glossy ibis (*Plegadis falcinellus*), Crested tern (*Thalasseus bergii*), Wood sandpiper (*Tringa glareola*), common Greenshank (*Tringa nebularia*) and Marsh sandpiper (*Tringa stagnatilis*).

The Blue-billed duck (*Oxyura australis*) is a Priority 4 species with 472 records in the local area. This species can breed from August to March, mostly between October to January (DBCA, 2021). Breeding habitat is typically secluded densely vegetated situations, with the nest constructed in Typha beds or other vegetation, in permanent water. Nests are usually constructed from dead Typha leaves and sometimes thinly lined with down (Birdlife Australia, 2020a). As the application area includes a portion that has *Typha orientalis*, this species could potentially be impacted by the proposed clearing.

The Australasian Bittern (*Botaurus poiciloptilus*) is an endangered species with six known records in the local area. This species favours permanent freshwater wetlands with tall, dense vegetation, particularly *Eleocharis* spp (Spike rushes) and Typhus (DBCA, 2018). The species is known to breed in Spring-Summer, with egg laying known to occur in September to December (DBCA, 2021). The closest record is 3.38 km from the application area in Smith's lake reserve. This record is based on historical records from 1979 and was not included in the recovery plan as only Thomsons Lake, Forrestdale Lake and James Swamp were close to the Perth metropolitan area (DBCA, 2018). While the application area is outside the current range of Australasian bittern, it may potentially visit areas outside of its current range.

The Australian little bittern (*Ixobrychus dubius*) is a Priority 4 species with two records in the local area. The Australian little bittern has similar habitat requirements to the Australasian Bittern 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, 2020b). 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 (Bird life Australia, 2020b). Little bittern may visit wetlands on the Swan Coastal Plain, and there is a possibility of the species occurring within the application area, but the probability is low (DBCA, 2021).

The Black bittern (*Ixobrychus flavicollis australis* southwest subpop) is a Priority 2 species with three records in the local area. 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 (Australian Museum, 2020).

There were some *Melaleuca raphiophylla* present in the *Typha orientalis* rushland the loss of which may influence the breeding of the Black bittern. Additional trees will be planted in the area under the rehabilitation plan (Natural Area, 2020), which will likely provide additional habitat in the long term.

The Australian painted snipe (*Rostratula australis*) is an endangered species with one record recorded 7.5 kilometres away from the application area. Painted snipe, is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled (DAWE, 2003). This habitat is similar to that found at Berringa Park wetlands and Painted snipe may range through the area. However, as the species was last recorded in 2002 by a single individual near Herdsman Lake, it is unlikely this species is still present in the local area. Given the purpose of weed removal followed by rehabilitation of the wetlands, it is unlikely to significantly impact this species.

Carter's freshwater mussel (*Westralunio carteri*) is a vulnerable species with eight records in the local area. The closest record and only one upstream of the application area is a historical record from 1905. The current distribution of Carter's freshwater mussel is bounded by Gingin Brook in the north to the Kent, Goodga and Waychincup Rivers in the south, within 50-100 kilometres of the coast. The species has been found to have undergone a 49 per cent reduction in extent of occurrence in less than three generations, due primarily to secondary salinisation. Apart from salinity, pereniality of stream flow was identified to be the other major limiting variable in the distribution of Carter's freshwater mussel, suggesting that habitat drying, inadequate provision of environmental stream flows and dewatering could pose further conservation constraints on the species (Klunzinger et al, 2015). While the mussel has not been recorded within the application area, suitable habitat may occur.

The Rakali or Water rat (*Hydromys chrysogaster*) is a priority 4 species with 25 records in the local area. Rakali are amphibious or semiaquatic mammals reaching up to 70 centimetres in length (from nose to end of the tail), feeding largely underwater, on a wide range of prey including large insects, crustaceans, mussels and fishes, and even frogs, lizards, small mammals and water birds. Although dependent on water for foraging, Rakali live on land, in burrows on low banks of rivers, lakes, wetlands, and estuaries including coastal areas. Intact riparian vegetation and associated bank stability is critical to their survival (DWER, 2021). While not present in the application area, they may range through the application area, as ranging territory can be up to 4 kilometres of riverbank (DWER, 2021).

Conclusion

Based on the above assessment, the vegetation type consisting mostly of *Typha orientalis* may provide breeding habitat and a source of nest building material for Blue billed duck. There is a low probability that the seven migratory shore birds, the Australian painted snipe, Australasian bittern, Little bittern and Black bittern may temporarily utilise the wetlands as a foraging habitat. Carter's freshwater mussel has a low chance to be in the application area, so while suitable habitat may exist, it is unlikely to be significantly impacted by the proposed clearing. While the Rakali may range through the application area, it is unlikely to be significantly impacted by the proposed clearing, given the rehabilitation planned to occur. No significant habitat for fauna is likely to be impacted.

For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed by conducting pre-clearing site inspections and slow directional clearing to minimise impacts that may be present at the time of clearing.

Conditions

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

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

3.2.3. Significant remnant vegetation and Conservation areas - Clearing Principles (e and h)

Assessment

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The Environmental Protection

Authority (EPA) recommends a minimum ten per cent representation threshold for ecological communities in constrained areas 'where there is a reasonable expectation that development will be able to proceed' (EPA, 2008).

The application area is located within the Perth Metropolitan Region Scheme boundary, which the EPA recognises to be a constrained area.

The mapped vegetation association 44 retains more than ten per cent of their pre-European extent remaining at 26.87 per cent. However, the local area retains less than ten per cent of its pre-European native vegetation cover at 5.86 per cent and is considered to be extensively cleared.

The application area is in a Completely Degraded condition (Keighery, 1994) and the purpose of the clearing is to remove weeds and then rehabilitate the area according to the Beringa Park Wetlands Conservation Plan 2020-2030 (Natural Area, 2020). A portion of the application area is representative of the 'Subtropical and Temperate Coastal Saltmarsh' TEC and despite being in a Completely Degraded condition still retains important natural values. On this basis, it is considered that the application area is significant as a remnant in an extensively cleared area.

The application area overlaps with the Bush Forever conservation area. The Bush Forever policy team had no objections towards the proposed clearing as the weed removal and vegetation would provide a net environmental benefit through the re-establishment of a native vegetation community (DPLH, 2023).

Conclusion

For the reasons set out above, it is considered that the native vegetation within the application area is significant as a remnant in an extensively cleared area. Noting the applicant proposed to clear the area to remove weeds and then rehabilitate the area under the Conservation Plan produced by Natural Area (2020), it is considered that the impact of the proposed clearing is unlikely to sever connectivity within the foreshore corridor and the rehabilitation is deemed to mitigate the loss of native vegetation within the extensively cleared local area.

Conditions

It is considered that the impacts outlined above can be managed. To address these 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
- rehabilitation of foreshore vegetation according to the Beringa Park Wetlands Conservation Plan 2020-2030
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback

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

Assessment

The proposed clearing is for the purpose of removing weeds while also controlling Typha due to its invasive nature and adverse impacts on wetlands in the absence of management. Given the area will be rehabilitated after the clearing, it is not likely to result in any long-term impact to the ecological values of the riparian vegetation communities and associated wetland within the application area.

The soil unit mapped within the application area indicated a high risk of subsurface acid sulphate soil, high phosphorous export and flooding. The weeds will be removed manually by machine or hand, chemical by application of glyphosate, fusillade forte or Metsulfuron depending on the species. Typha will also be cleared through slashing and mulching where necessary for weed management to maintain drainage flow. 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 subsurface acidification, phosphorus export and flooding (DBCA, 2019).

The targeted removal of weeds and subsequent rehabilitation of the application area is unlikely 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 the riparian and wetland habitats within the application area through the removal of weeds and where needed, Typha. The selective

clearing of weeds and Typha within the application area is not likely to lead appreciable land degradation in the form of subsurface acidification, phosphorus export and flooding. No management conditions are required in relation to this environmental value.

3.3. Relevant planning instruments and other matters

The application area falls within the Swan River Development Control area managed by DBCA. DBCA granted the City of Bayswater approval to remove vegetation within the Swan Canning development control area on the 14 April 2023 (DBCA, 2023).

The Department of Planning, Lands and Heritage (DPLH) had no objections to the land use planning or management for the proposal to remove weeds from Beringa Park Wetlands (DPLH, 2023).

It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972 (WA)* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

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

A.1. Site characteristics

Characteristic	Details				
Local context	<p>The area proposed to be cleared is part of the Beringa Park wetlands, and is made up of a mixture of <i>Typha orientalis</i> rushland and <i>Juncus kraussii</i> sedgeland. The area is part of an isolated patch of native vegetation in the intensive land use zone of Western Australia.</p> <p>Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains 5.86 per cent of the original native vegetation cover.</p>				
Ecological linkage	<p>The application area forms part of the Perth regional ecological linkages. The proposed clearing and subsequent rehabilitation of the application will not sever or severely impact the function of this ecological linkage.</p>				
Conservation areas	<p>The application area is part of a Bush Forever site and is next to the Swan River.</p>				
Vegetation description	<p>Vegetation survey by Natural Area (2020) indicate the vegetation within the proposed clearing area consists of two vegetation types:</p> <ul style="list-style-type: none"> Rushland dominated by <i>Typha orientalis</i> and <i>Pteridium esculentum</i> amongst a large weed diversity of Blackberry, Coastal Morning Glory, Elephant Ears and <i>Hibiscus diversifolius</i>, and Sedgeland dominated by <i>Juncus kraussii</i> and associated with samphire flora species <i>Salicornia quinqueflora</i> and <i>Samolus repens</i> along the slightly elevated drier edges. <p>Representative photos are available in 0.</p> <p>This is consistent with the mapped vegetation type(s):</p> <ul style="list-style-type: none"> Vegetation ranges from woodland of <i>Eucalyptus marginata</i> (Jarrah) - <i>Allocasuarina fraseriana</i> (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of <i>Eucalyptus marginata</i> (Jarrah) to <i>Eucalyptus todtiana</i> (Pricklybark) in the vicinity of Perth. <p>The mapped vegetation type retains approximately 26.87 per cent of the original extent (Government of Western Australia, 2019).</p>				
Vegetation condition	<p>Vegetation survey indicate the vegetation within the proposed clearing area is in a completely degraded (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in 0. Representative photos and the full survey descriptions are available in 0.</p>				
Climate and landform	<p>The climate is classified as Mediterranean, with dry, hot summers and cool, wet winters with a mean maximum temperature of 33.2 degrees in January and a mean minimum temperature of 8.8 degrees in July. Rainfall is highest in the winter months of June, July and August (BOM 2023).</p> <p>The application area comprises of one landform the Pinjarra system, Swan Coastal Plain from Perth to Capel. It is described as poorly drained coastal plain with variable alluvial and aeolian soils. Variable vegetation includes Jarrah, marri, wandoo, paperbark sheoaks and rudis.</p>				
Soil description	<table border="1"> <thead> <tr> <th>Name</th> <th>EnvGeol Mc1 Phase</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Name	EnvGeol Mc1 Phase		
Name	EnvGeol Mc1 Phase				

Characteristic	Details	
	Soils	Clay saline wet soil, brown deep sand, red/brown non-cracking clay, loam semi wet soil
	Description	Clayey silt - yellow brown to strong brown, blocky, mottled, soft, with variable clay content, dispersive in part, of alluvial origin
Land degradation risk	The degradation risk factors mapped over the application area are detailed below:	
	Wind erosion	M2
	Water erosion	L2
	Water repellence	L1
	Salinity risk	M2
	Phosphorous export	H2
	Waterlogging	M2
	Subsurface acidification	H2
	Acid sulphate soils	High to moderate
	Flooding	H1
	Floodplains	1 to 10% AEP
Waterbodies	The desktop assessment and aerial imagery indicated that the application area overlaps with the Swan Canning Estuary.	
Hydrogeography	The application area is in the Perth Groundwater Area RIWI site	
Flora	There are 71 conservation significant flora in the local area with the closest <i>Isopogon autumnalis</i> (P3) located 2.35 km from the application area. No conservation significant flora species have been recorded or mapped within the application area.	
Ecological communities	The application area is partially mapped as the subtropical and temperate coastal saltmarsh community, listed as a state listed Priority 3 PEC and EPBC Vulnerable listed TEC. The <i>Juncus kraussii</i> sedgeland within the application area was mapped in Natural Area (2020) survey and was found to be representative of that priority ecological community in a completely degraded condition.	
Fauna	There are 65 conservation significant fauna in the local area with the closest <i>Falco peregrinus</i> 97 m from the application area and another eight, <i>Calyptorhynchus latirostris</i> (EN), <i>Thalasseus bergii</i> (MI), <i>Tringa nebularia</i> (MI), <i>Calyptorhynchus banksii naso</i> (VU), <i>Neelaps calonotos</i> (P3), <i>Cacatua pastinator pastinator</i> (CD), <i>Dasyurus geoffroi</i> (VU) and <i>Idiosoma sigillatum</i> (P3) within 1 km of the application area.	

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	38.45	14.85
Vegetation complex					

	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
Hedde vegetation complex Swan Coastal Plain – Aeolian deposits Bassendean Complex – Central and South vegetation association 44 **	87,476.26	23,508.66	26.87	4,377.36	5.00
Local area					
10 km radius	29196.57	1710.15	5.86	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Fauna analysis table

Species name	Common Name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Actitis hypoleucos</i>	Common Sandpiper	MI	Y	9.83	2	N/A
<i>Botaurus poiciloptilus</i>	Australasian bittern	EN	Y	3.38	6	N/A
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	Y	3.21	4	N/A
<i>Hydromys chrysogaster</i>	water-rat, rakali	P4	Y	3.36	25	N/A
<i>Ixobrychus dubius</i>	Australian little bittern	P4	Y	2.25	2	N/A
<i>Ixobrychus flavicollis australis</i> (southwest subpop.)	Black bittern (southwest subpop.)	P2	Y	4.23	3	N/A
<i>Oxyura australis</i>	Blue-billed duck	P4	Y	1.13	472	N/A
<i>Plegadis falcinellus</i>	Glossy ibis	MI	Y	6.94	49	N/A
<i>Rostratula australis</i>	Australian painted snipe	EN	Y	7.55	1	N/A
<i>Thalasseus bergii</i>	Crested tern	MI	Y	0.17	258	N/A
<i>Tringa glareola</i>	Wood sandpiper	MI	Y	3.14	9	N/A
<i>Tringa nebularia</i>	Common greenshank	MI	Y	0.17	60	N/A
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	Y	3.38	1	N/A
<i>Westralunio carteri</i>	Carter's freshwater mussel	VU	Y	4.23	8	N/A

A.4. Ecological community analysis table

Community name	Conservation status (State)	Conservation status (National)	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Subtropical and Temperate Coastal Saltmarsh	P3	VU	Y	N	Y	0	Y

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p>Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>A portion of the application area is mapped as the 'Subtropical and Temperate Coastal Saltmarsh' (Priority 3) PEC and EPBC vulnerable listed TEC. This area is mapped in a completely degraded condition.</p>	May be at variance	Yes Refer to section 3.2.1 above
<p>Principle (b): "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain foraging, roosting or breeding habitat for conservation significant fauna.</p>	May be at variance	Yes Refer to section 3.2.2 above
<p>Principle (c): "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for threatened flora species.</p>	Not likely to be at variance	No
<p>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."</p> <p><u>Assessment:</u></p> <p>The application area includes an area that resembles the 'Subtropical and Temperate Coastal Saltmarsh' TEC.</p>	May be at variance	Yes Refer to section 3.2.1 above
Environmental value: significant remnant vegetation and conservation areas		
<p>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."</p> <p><u>Assessment:</u></p> <p>The extent of the native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The</p>	At variance	Yes Refer to section 3.2.3 above

Assessment against the clearing principles	Variance level	Is further consideration required?
vegetation proposed to be cleared is considered to be part of an ecological linkage in the local area.		
<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> Given the application area overlaps with a bush forever site, the proposed clearing may have an impact on the environmental values of conservation areas.</p>	May be at variance	Yes Refer to section 3.2.3 above
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> Given the application area is a wetland and contains wetland species, the proposed clearing is growing in an environment associated with a wetland.</p>	At variance	Yes Refer to section 3.2.4 above
<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> The mapped soils are highly susceptible to nutrient export, subsurface acidification and flooding.</p>	May be at variance	Yes Refer to section 3.2.4 above
<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> Given the application area is within a wetland, the proposed clearing may impact surface or ground water quality.</p>	May be at variance	Yes Refer to section 3.2.4 above
<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> The mapped soils and topographic contours in the surrounding area may indicate the proposed clearing could contribute to increased incidence or intensity of flooding.</p>	May be at variance	Yes Refer to section 3.2.4 above

Appendix C. Vegetation condition rating scale

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

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

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

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



Appendix D. Biological survey information excerpts



Example of vegetation type and condition of *Typha orientalis* rushland (Natural Area, 2020).



Example of vegetation type and condition of *Juncus kraussii* sedgeland (Natural Area, 2020)

Name	Description	Area (ha) Cover (%)	Photograph
<i>Typha orientalis</i> Rushland	Rushland dominated by <i>Typha orientalis</i> and <i>Pteridium esculentum</i> amongst a large weed diversity of Blackberry, Coastal Morning Glory, Elephant Ears and <i>Hibiscus diversifolius</i> .	1.37 ha 11.7%	
<i>Juncus kraussii</i> Sedgeland (TEC)	Sedgeland dominated by <i>Juncus kraussii</i> and associated with samphire flora species <i>Salicornia quinqueflora</i> and <i>Samolus repens</i> along the slightly elevated drier edges.	6.88 ha 58.8%	

Vegetation type descriptions within application area (Natural Area, 2020).

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

Australian Museum (2020) <https://australian.museum/learn/animals/birds/black-bittern/>, accessed May 2023.

Birdlife Australia (2020a) <https://www.birdlife.org.au/bird-profile/blue-billed-duck>, accessed May 2023.

Birdlife Australia (2020b) Australian Little Bittern Identification Guide:
<https://www.birdlife.org.au/documents/ABalbguide.pdf>, accessed May 2023.

City of Bayswater (2023) *Clearing permit application CPS 10056/1*, received 25 January 2023 (DWER Ref: DWERDT717737).

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

Department of Agriculture Water and the Environment, DAWE (2003), Nationally threatened species and ecological communities <https://www.environment.gov.au/biodiversity/threatened/publications/-australian-painted-snipe-rostratula-australis>, accessed May 2023

Department of Biodiversity, Conservation and Attractions (2018) Australasian bittern (*Botaurus poiciloptilus*) western Australian Recovery Plane. Wildlife management Program No.64.

Department of Biodiversity, Conservation and Attractions (DBCA) (2021) Species and Communities Branch Fauna advice for clearing permit application CPS 9071/1, received 15 April 2021. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: A1997386).

Department of Biodiversity, Conservation and Attractions (DBCA) (2023) *Swan River Trust – Development control area advice for clearing permit application CPS 10056/1*, received 4 May 2023. Department of Biodiversity, Conservation and Attractions, Western Australia. (DWER Ref: DWERDT773701).

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 Planning, Lands and Heritage (DPLH) (2023). Advice for clearing permit application CPS 10056/1, received 17 March 2023 (DWER Ref: DWERDT752931)

- 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 30 April 2023).
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2013). *Conservation Advice for the Subtropical and temperate coastal saltmarsh*. Canberra. Available from: <https://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf>
- 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 Rivers (2021) Available from: <https://rivers.dwer.wa.gov.au/species/hydromys-chrysogaster/> (accessed 4 May 2023)
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.
- 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>
- 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>
- Hedde, 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.
- Klunzinger, M.W., Beatty, S.J., Morgan, D.L., Pinder, A.M., Lymbery, A.J. (2015) Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia : Hyriidae) from south-western Australia. *Australian Journal of Zoology*, 63, 127-135.
- 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.
- Natural Area (2020) *City of Baywater: Beringa Park Wetlands Conservation Plan 2020-2030*, received 25 January 2023 (DWER Ref: DWERDT717737)
- 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 outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- 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.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 28 April 2023)