Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5351/6
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia
Application received date: 24 October 2022

1.3. Property details

Property: Various road reserves
Local Government Authority: City of Armadale
City of Bayswater
City of Belmont
City of Bunbury
City of Busselton
City of Canning
City of Cockburn
City of Fremantle
City of Gosnells
City of Kwinana
City of Perth
City of Rockingham
City of South Perth
City of Swan
City of Vincent
Shire of Chittering
Shire of Dardanup
Shire of Manjimup
Shire of Serpentine Jarrahdale
Shire of Walpole
Town of Bassendean
Town of East Fremantle
Town of Victoria Park

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
6.5		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 22 December 2022
Reasons for Decision: This clearing permit amendment application was submitted, accepted, assessed, and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance to principle (f) and is not likely to be at variance to any of the remaining clearing principles.

The Department of Water and Environmental Regulation (DWER) advertised the application for 14 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Section 2), relevant datasets (see Section 5.1), the clearing principles set out in Schedule 5 of the EP Act, relevant planning instruments and any other matters considered relevant to the assessment. The Delegated Officer also took into consideration that the proposed amendment relates only to extending the permit duration by 5 years to 4 January 2028, to allow for the ongoing establishment and re-establishment of maintenance zones around 65 existing bridges in the Metropolitan, South West, and Great Southern regions of Western Australia.

A review of current environmental information identified that the environmental values present within the existing permit area remain largely unchanged from the previous assessments of the permit. The Delegated Officer considered that the vegetation proposed to be cleared consists of historically disturbed isolated trees, shrubs, and understorey or areas of regrowth on the edge of larger vegetated remnants within 10 metres of existing bridge infrastructure, with a maximum of 0.1 hectares proposed to be cleared at each location.

Given the ongoing nature of site disturbance since 2013 and the proximity to existing road and rail infrastructure, the Delegated Officer determined that the permit area was unlikely to provide significant habitat for conservation significant flora and fauna species, to be representative of a threatened or priority ecological community, or to be significant as a remnant within an extensively cleared area. The Delegated Officer determined that the proposed amendment will result in the removal vegetation growing in association with a watercourse or wetland and may facilitate the introduction and spread of weeds and dieback into adjacent vegetation, including into nearby conservation areas and significant ecological communities. However, given the extent of the proposed clearing at each location, the disturbance history of the sites, and the existing permit conditions, the Delegated Officer determined that the ongoing clearing of bridge maintenance areas is not likely to result in significant impacts to riparian vegetation or to significantly contribute to the spread of weeds and dieback.

In considering the above, the Delegated Officer determined that the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values remains unchanged from the previous assessments of the permit and can be found in the Decision Reports prepared for CPS 5351/1 and CPS 5351/3. Noting the above, the Delegated Officer considered that the proposed amendment is not likely to lead to an unacceptable risk to environmental values, subject to conditions to:

- avoid, minimise, and reduce the impacts and extent of clearing, and
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

In addition to extending the permit duration, the Delegated Officer determined that minor amendments to existing permit conditions and the inclusion of recording and reporting conditions were also required to bring the permit in line with current departmental policies and procedures.

2. Site Information

Clearing Description

The proposed amendment to CPS 5351/5 is for the purpose of extending the permit duration by 5 years to 4 January 2028, to allow for the ongoing establishment and re-establishment of maintenance zones around 65 existing bridges in the Metropolitan, South West, and Great Southern regions of Western Australia. The vegetation proposed to be cleared ranges from isolated immature trees, shrubs and understorey in some locations to regrowth areas on the edge of larger remnants of native vegetation in others, but consists of historically disturbed and cleared areas within 10 metres of the existing bridge infrastructure at all locations.

CPS 5351/5 allowed for the clearing of a total of no more than 6.5 hectares of native vegetation for the purpose of establishing/re-establishing maintenance zones within a 10-metre radius of each of the 65 bridges described in the permit. The intention of CPS 5351 is to allow for the maintenance of existing cleared and disturbed areas around bridge infrastructure that occur within mapped Environmentally Sensitive Areas (ESAs), in which exemptions under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations) that would typically allow for this activity do not apply.

CPS 5351/5 does not require the permit holder to maintain records of the total extent of clearing undertaken under the permit to date.

Vegetation Description

The permit area occurs within the Swan Coastal Plain, Jarrah Forest, and Warren IBRA bioregions between the Shire of Chittering in the North and Shire of Walpole in the South. The application area is mapped within various Beard (Shepherd et al., 2001), Swan Coastal Plain (Heddle et al., 1980), and South West Forest (Mattiske and Havel, 1998) vegetation associations:

- Beard vegetation association 4, described as medium woodland; *Corymbia calophylla* (marri) and *Eucalyptus wandoo* (wandoo) (Shepherd et al., 2001).
- Beard vegetation association 352, described as medium woodland; *Eucalyptus loxophleba* (York gum) (Shepherd et al., 2001).
- Abba Complex, described as a mixture of open forest of marri - *Eucalyptus marginata* (jarrah) - *Banksia* species and woodland of marri with minor occurrences of *Corymbia haematoxylon* (mountain marri). Woodland of *Eucalyptus rudis* (flooded gum) - *Melaleuca* species along creeks and on flood plains (Heddle et al., 1980).
- Bassendean Complex-Central and South, described as vegetation ranges from woodland of jarrah - *Allocasuarina fraseriana* (sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of jarrah to *Eucalyptus todtiana* (pricklybark) in the vicinity of Perth (Heddle et al., 1980).

- Cottesloe Complex-Central and South, described as mosaic of woodland of *Eucalyptus gomphocephala* (tuart) and open forest of tuart - jarrah – marri; closed heath on the limestone outcrops (Heddle et al., 1980).
- Forrestfield Complex, described as vegetation ranges from open forest of marri - wandoo - jarrah to open forest of jarrah - marri – sheoak - *Banksia* species. Fringing woodland of flooded gum in the gullies that dissect this landform (Heddle et al., 1980).
- Guildford Complex, described as a mixture of open forest to tall open forest of marri - wandoo - jarrah and woodland of wandoo (with rare occurrences of *Eucalyptus lane-poolei* (maiden salmon white gum). Minor components include flooded gum - *Melaleuca rhaphiophylla* (swamp paperbark) (Heddle et al., 1980).
- Karrakatta Complex-Central and South, described as predominantly open forest of tuart - jarrah - marri and woodland of jarrah - *Banksia* species. *Agonis flexuosa* (peppermint) is co-dominant south of the Capel River (Heddle et al., 1980).
- Quindalup Complex, 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 peppermint forest of Geographe Bay (Heddle et al., 1980).
- Southern River Complex, described as open woodland of marri – jarrah - *Banksia* species with fringing woodland of flooded gum – swamp paperbark along creek beds (Heddle et al., 1980).
- Swan Complex, described as fringing woodland of flooded gum – swamp paperbark with localised occurrence of low open forest of *Casuarina obesa* (swamp sheoak) and *Melaleuca cuticularis* (saltwater paperbark) (Heddle et al., 1980).
- Vasse Complex, described as mixture of the closed scrub of *Melaleuca* species fringing woodland of flooded gum - *Melaleuca* species and open forest of tuart - jarrah – marri. Will include areas dominated by *Tecticornia* and *Sarcocornia* species (samphire) near Mandurah and south of the Capel River (Heddle et al., 1980).
- Yanga Complex described as predominantly a closed scrub of *Melaleuca* species and low open forest of swamp sheoak on the flats subject to inundation. On drier sites the vegetation reflects the adjacent vegetation complexes of Bassendean and Coonambidgee (Heddle et al., 1980).
- Granite Valleys, V4, described as tall open forest of *Eucalyptus diversicolor* (karri) - *Allocasuarina decussata* (karri sheoak) - peppermint with *Eucalyptus patens* (blackbutt) and marri on slopes at the interface between granite hills and the southern coastal plain, with some shrublands of Myrtaceae spp. in hyperhumid and perhumid zones (Mattiske and Havel, 1998).
- Granite Valleys, Vh3, described as tall open forest of karri - *Eucalyptus guilfoylei* (yellow tingle) on slopes and woodland of flooded gum - *Banksia littoralis* (swamp banksia) on lower slopes in hyperhumid and perhumid zones (Mattiske and Havel, 1998).
- Kordabup, KO, described as mosaic of low forest of *Taxandria juniperina* (wattie), closed heath of Myrtaceae – Proteaceae - Fabaceae spp. with occasional emergent *Melaleuca preissiana* (moonah) and swamp banksia on broad swampy plains in hyperhumid and perhumid zones (Mattiske and Havel, 1998).
- Nooning, No, described as mosaic of low open forest of swamp sheoak and open scrub of swamp sheoak - *Acacia* spp. - *Melaleuca* spp. and woodland of flooded gum - swamp paperbark on major valley systems in the perarid zone (Mattiske and Havel, 1998).
- Pingerup, Pi, described as mosaic of closed heaths of *Myrtaceae* spp. and sedgeland of Restionaceae - Cyperaceae spp. with occasional emergent blackbutt and moonah on broad depressions and drainage corridors in hyperhumid and perhumid zones (Mattiske and Havel, 1998).

As the vegetation within the permit area has been historically cleared and disturbed for maintenance zones around existing bridges and consists primarily of regrowth, it is not considered likely that the vegetation proposed to be cleared is representative of the mapped vegetation types at present.

Vegetation Condition

Given the vegetation within the permit area has been historically cleared and disturbed for maintenance zones around existing bridges, the condition of the vegetation within the permit area is considered to range from Good to Degraded (Keighery, 1994) condition:

- Good, described as 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, and

- Degraded, described as 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 (Keighery 1994).

Soil Type

The soil type within the permit area is mapped as the following subsystems:

- Abba System (213Ab), described as poorly drained flats, on the southern Swan Coastal Plain with grey deep sandy duplex and wet soil in jarrah-marri-paperbark woodland,
- Bassendean System (212Bs), described as Swan Coastal Plain from Busselton to Jurien with sand dunes and sandplains with pale deep sand, semi-wet and wet soil in banksia-paperbark woodlands and mixed heaths,
- Broke System (254Br), described as poorly drained plain with low granitic rises, along the coast of the Warren-Denmark Southland with non-saline wet soil and pale deep sand in sedges, tea-tree heath and paperbark-banksia woodlands,
- Forrestfield System (213Fo), described as undulating foot slopes of the Darling and Whicher Scarps with duplex sandy gravels, pale deep sands and grey deep sandy duplexes in woodland of jarrah, marri, and wandoo and some *Banksia grandis* (bull banksia),
- Nooning System (253Nn), described as Brockman River Valley flattish valley floors of the upper that is prone to salinity with loams, clays and gleyed salty sandy clays and gravelly soils are present in flooded gum, blackbutt and *Melaleuca* spp., swamp sheoak in the most salty areas,
- Northcliffe System (254Nf), described as undulating terrain with low rises and swampy plains with pale deep sands, loamy gravels, wet soils and semi-wet soils,
- Pingerup System (254Pi), described as poorly drained flats with scattered rocky rises with wet soils, semi wet soils, pale deep sands and duplex sandy gravels.
- Pinjarra System (213Pj), described as Swan Coastal Plain from Perth to Capel with poorly drained coastal plain with variable alluvial and aeolian soils in variable vegetation including jarrah, marri, wandoo, paperbark sheoaks and flooded gum,
- Quindalup South System (211Qu), described as voastal dunes, of the Swan Coastal Plain, with calcareous deep sands and yellow sands in coastal scrub,
- Reagan System (222Re), described as gentle slopes from the Dandaragan plateau to the Pinjarra plain with brown, yellow and pale sands that may be shallow to very deep with clay or duricrust underlying in variable low woodland and shrubland of Eucalypts, *Banksia* spp., *Acacia* spp.,
- Spearwood System (211Sp), described as sand dunes and plains with yellow deep sands, pale deep sands and yellow/brown shallow sands, and
- Walpole Hills System (254Wh), described as granitic hills and low hills, in the south of the Warren-Denmark Southland with loamy gravel, loamy earth, sandy gravel and loamy duplex in jarrah-marri-karri forest and woodland (DPIRD, 2022).

3. Avoidance and mitigation measures

While it is acknowledged that the majority of the clearing proposed under the amendment will occur within vegetation regrowth that has been historically disturbed and cleared for maintenance zones around existing bridges, the Delegated Officer considers it important for the permit holder to continue to consider, where practical, whether it is still necessary to undertake clearing within the entirety of the area approved under the clearing permit. The existing permit condition, requiring the permit holder to have regard to the mitigation hierarchy, remains appropriate to ensure that the amount of native vegetation to be cleared under the amended permit is limited to only the extent necessary.

The permit holder has advised that vegetation clearing under the permit will continue to be minimised where possible and will only be undertaken to the extent necessary to facilitate maintenance of the existing bridge infrastructure and to ensure fire protection for the bridges (MRWA, 2022). The permit holder also advised that pruning will be undertaken as an alternative to clearing where appropriate and, where fire risk is low, established trees will be retained and only understorey vegetation will be cleared (MRWA, 2022).

The remaining avoidance and mitigation measures employed by the permit holder are unchanged and can be found in the Decision Reports prepared for Clearing Permits CPS 5351/1 to CPS 5351/5.

4. Assessment of application against clearing principles

A review of current environmental information indicates that the environmental values present within the existing permit area remain largely unchanged from the previous assessments of the permit.

Conservation significant flora

According to available databases, there are no records of threatened or priority flora species within a 10-metre radius of the 65 bridges in which clearing is proposed to occur (WA Herbarium, 1998-). The closest record of a conservation significant flora species is a record of *Myriophyllum trifidum* (P4) in a continuous remnant of roadside vegetation approximately 25 metres from an unnamed bridge crossing on South Western Highway in the Shire of Manjimup, which is unchanged from the previous assessments of the permit. Given the distribution of existing records and that each clearing area comprises 0.1 hectares of historically disturbed and cleared vegetation within the maintenance zone of existing bridge infrastructure, it is not expected that the permit area comprises significant habitat for conservation significant flora species or that the proposed clearing presents a risk to the continuation of any threatened or priority flora species.

Conservation significant fauna

A desktop assessment of current databases identified that various conservation significant fauna species have been recorded in the vicinity of the 65 bridges (DBCA, 2007-), including:

- *Calidris ruficollis* (red-necked stint) (listed as Migratory and protected under International Agreement under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act))
- *Galaxiella munda* (mud minnow) (listed as Vulnerable under the *Biodiversity Conservation Act 2018* (BC Act)),
- *Hydromys chrysogaster* (rakali) (listed as Priority 4 by DBCA),
- *Isoodon fusciventer* (quenda) (listed as Priority 4 by DBCA),
- *Nannatherina balstoni* (Balston's pygmy perch) (listed as Vulnerable under the BC Act and EPBC Act),
- *Oxyura australis* (blue-billed duck) (listed as Priority 4 by DBCA),
- *Pluvialis squatarola* (grey plover) (listed as Migratory and protected under International Agreement under the EPBC Act)
- *Thalasseus bergii* (crested tern) (listed as Migratory and protected under International Agreement under the EPBC Act),
- *Zanda latirostris* (previously *Calyptorhynchus latirostris*) (Carnaby's cockatoo) (listed as Endangered under the BC Act and EPBC Act).

The red-necked stint, mud minnow, rakali, Balston's pygmy perch, blue-billed duck, grey plover, and crested tern are all reliant on intact aquatic or wetland habitats that are not likely to be present within the permit area or to be disturbed by the clearing of bridge maintenance zones. While suitable habitat for quenda may be present within the permit area, the vegetation proposed to be cleared consists of isolated immature trees, shrubs, and understorey or regrowth areas on the edge of larger remnants of native vegetation within a 10-metre radius of existing bridges, and is unlikely to provide the dense understorey typically associated with significant habitat for this species. Similarly, the permit area does not contain mature trees that provide suitable breeding habitat for Carnaby's cockatoo and is unlikely to provide significant foraging resources given the vegetation is predominantly immature regrowth and noting the ongoing nature of the clearing, will not be of an age to provide adequate foraging resoruces. Given the disturbance history of the vegetation within the permit area and its proximity to road and rail infrastructure, it is also not expected that fauna are reliant on the vegetation within the permit area for refuge sites or as an ecological linkage when moving through the landscape.

Threatened and priority ecological communities

According to available databases, 18 of the 65 bridges occur within 100 metres of a mapped threatened or priority ecological community (TEC or PEC). These include occurrences of the '*Acacia* shrublands on taller dunes' (SCP29b), '*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994))' (SCP40a), Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994)) (SCP08), 'Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region', and 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' communities. However, as the permit area consists of historically disturbed isolated immature trees, shrubs, and understorey or areas of regrowth adjacent to existing remnants, it is not considered likely that the areas within a 10-metre radius of the existing bridges are representative of a TEC or PEC. Given the proximity to mapped TECs and PECs, it is acknowledged that the proposed clearing could result in indirect impacts to local occurrences by facilitating the spread of weeds and dieback into adjacent vegetation. The existing weed and dieback condition is considered to mitigate this risk.

Conservation areas and significant remnant vegetation

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). However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region to be a constrained area, within which a minimum 10 per cent representation threshold for ecological communities is recommended (EPA, 2008). Vegetation extent within the Swan Coastal Plain, Jarrah Forest, and Warren IBRA bioregions is above the 30 per cent threshold (Government of Western Australia, 2019b). Two of the mapped vegetation associations within a 10-metre radius of the existing bridges fall below the 10 per cent threshold for constrained areas (Abba Complex and Guildford Complex) and one mapped vegetation type falls below the 30 per cent threshold outside of the Perth Metropolitan Region (Nooning Complex) (Government of Western Australia, 2019a). However, the vegetation within the permit area has been historically cleared and disturbed for maintenance and consists primarily of immature regrowth. Therefore, it is not considered likely that the vegetation proposed to be cleared is representative of the mapped vegetation types at present or that the removal of this vegetation will significantly impact the extent or ongoing maintenance of these communities or the regions in which the permit area occurs.

As identified in the previous assessments, many of the bridges occur within or in close proximity to conservation reserves, including Chittering Lakes Nature Reserve, Waterloo Nature Reserve, Bush Forever sites, and areas protected under the *Swan*

and Canning Rivers Management Act 2006. Although it is not expected that the maintenance of historically disturbed and cleared areas surrounding bridge infrastructure will significantly impact the environmental values of these conservation reserves, it is acknowledged that the proposed clearing could result in indirect impacts to local reserves by facilitating the spread of weeds and dieback into adjacent vegetation. The existing weed and dieback condition is considered to mitigate this risk.

Land and water resources
In regard to water resources, current databases do not indicate any changes in hydrological mapping since the previous assessment of the permit in 2017. As identified in the previous assessments, 19 of the 65 bridges intersect mapped perennial or non-perennial watercourses and 43 of the bridges intersect mapped wetlands including the Swan-Canning Estuaries, Chittering-Needonga Lakes, Avon River Valley, and various palusplains, floodplains, damplands, and sumplands. Further, several of the bridges occur within surface and/or groundwater areas proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) and one bridge occurs within the Jandakot Underground Water Pollution Control Area, a Priority 3 public drinking water source area (PDSWA) proclaimed under the *Metropolitan Water Supply Sewerage and Drainage Act 1909*. Therefore, the proposed clearing will impact vegetation growing in, or in association with, an environment associated with a watercourse and has the potential to impact water quality within proclaimed areas. However, the clearing proposed is limited to maintaining historically disturbed and cleared areas within 10 metres of existing bridges and is unlikely to impact intact riparian or wetland vegetation or to result in long-term impacts to surface or groundwater quality. During the previous assessments of the permit, the permit holder also committed to ensuring that vegetation immediately adjacent to watercourses is removed to a height of 100 millimetres to retain bank stability, which is expected to reduce the risk of erosion, deterioration of water quality, and localised flooding in riparian areas.

The permit area is mapped within 12 soil systems, each with varying degrees of land degradation risk. Given the proposed clearing is limited to a maximum of 0.1 hectares of previously disturbed or cleared areas within 10 metres of existing bridge infrastructure, it is not considered likely that the proposed clearing will result in appreciable land degradation.

Conclusion
The proposed amendment to CPS 5351/5 is for the purpose of extending the permit duration by five years to 4 January 2028, to allow for the ongoing establishment of maintenance zones around 65 existing bridges. The vegetation proposed to be cleared consists of historically disturbed isolated trees, shrubs, and understorey or areas of regrowth on the edge of larger vegetated remnants within 10 metres of existing bridges, with a maximum of 0.1 hectares proposed to be cleared at each location. A review of current environmental databases indicates that the environmental values within the permit area remain largely unchanged since the previous assessments of the permit and it is not considered that the ongoing clearing of these maintenance areas will significantly alter the impacts of the clearing approved under CPS 5351/5. Given the above and the nature of the proposed clearing, the Delegated Officer determined that the assessment against the clearing principles and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values remains unchanged from the previous assessments of the permit and can be found in the Decision Reports prepared for CPS 5351/1 and CPS 5351/3.

Planning instruments and other relevant matters

The clearing permit amendment application was advertised on DWER's website on 12 November 2022, inviting submissions from the public within a 14 day period. No submissions were received in relation to this application.

The Kwinana Freeway and rail crossing at Russell Road intersects the Jandakot Underground Water Pollution Control Area PDSWA proclaimed under the *Metropolitan Water Supply Sewerage and Drainage Act 1909* which was not identified in previous assessments of the permit. However, it is acknowledged that transport infrastructure is an acceptable land use within Priority 3 PDWSAs (DWER, 2021) and it is not expected that the ongoing establishment of maintenance zones around this crossing will significantly impact the PDWSA.

The remaining assessment against planning instruments and other matters is unchanged and can be found in the Decision Reports prepared for Clearing Permits CPS 5351/1 and CPS 5351/3.

5. Sources of information

5.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever Areas 2000 (DPLH-019)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- CAWSA Part 2A Clearing Control Catchments (DWER-004)
- Consanguineous Wetlands Suites (DBCA-020)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- DBCA Statewide Vegetation Statistics
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Geomorphic Wetlands, Augusta to Walpole (DBCA-017)
- Geomorphic Wetlands, Leeuwin Naturaliste Ridge and Donnybrook to Nannup - Unreviewed (DBCA-043)

- Geomorphic Wetlands Manjimup to Northcliffe - Unreviewed (DBCA-044)
- Geomorphic Wetlands, South West - Unreviewed (DBCA-040)
- Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments - Catchments (DWER-028)
- Hydrographic Catchments - Divisions (DWER-029)
- Hydrography, Linear (Hierarchy) (DWER-031)
- 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 (DPIRD-006)
- 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 (DPIRD-027)
- Soil Landscape Mapping – Systems (DPIRD-064)
- South Coast Significant Wetlands (DBCA-018)
- Vegetation Complexes - Swan Coastal Plain (DBCA-046)
- Vegetation Complexes - South West forest region of Western Australia (DBCA-047)

Restricted GIS Databases used:

- Conservation Covenants Western Australia (DPIRD-023)
- Contaminated Sites Database - Restricted (DWER-073)
- 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)

5.2. References

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

Department of Biodiversity, Conservation and Attractions (DBCA) (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. Available from: http://naturemap.dpaw.wa.gov.au/ (accessed November 2022).

Department of Primary Industries and Regional Development (DPIRD) (2022) *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. Available from: https://maps.agric.wa.gov.au/nrm-info/ (accessed November 2022).

Department of Water and Environmental Regulation (DWER) *Water quality protection note 25: Land use compatibility tables for public drinking water source areas*. Government of Western Australia. Available from: https://www.wa.gov.au/system/files/2022-04/Land-use-compatibility-tables-for-public-drinking-water-source-areas.pdf.

Environmental Protection Authority (EPA) (2008) *Environmental Guidance for Planning and Development Guidance Statement No 33*. Environmental Protection Authority, Western Australia.

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

Government of Western Australia (2019b) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. Available from: 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.

Commissioner of Main Roads Western Australia (MRWA) (2022) *Clearing permit amendment application CPS 5351/6*, received 24 October 2022 (DWER Ref: DWERDT675511).

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.

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. Available from: http://florabase.dpaw.wa.gov.au/ (accessed September 2022).