



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8947/1
Permit Holder:	Western Australia Land Authority T/A Development WA
Duration of Permit:	3 November 2020 to 3 November 2030

ADVICE NOTE

The permit area forms part of the larger Ocean Reef Marina development area, which encompasses approximately 42 hectares of land, of which 16.79 hectares is currently vegetated. As part of Metropolitan Region Scheme (MRS) amendment 1270/41, the rezoning of 26.26 hectares of Bush Forever Site 325 was undertaken to facilitate the development of the Ocean Reef Marina. To counterbalance the impacts of the rezoning of this area, the Permit Holder has secured a 26 hectare portion of Lot 51 on Plan 9474, Carabooda, represented by the area hatched red on attached Plan 8947/1d. This land acquisition combined with rehabilitation of five (5) hectares degraded vegetation adjacent to the development area was determined to counterbalance the environmental impacts to the portion of land excised from Bush Forever Site 325.

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of developing supporting infrastructure including signage and access roads, to facilitate development of breakwaters associated with the Ocean Reef marina development.

2. Land on which clearing is to be done

Lot 555 on Plan 402198, Iluka
Lot 1029 on Diagram 57604, Ocean Reef
Lot 10098 on Plan 216093, Ocean Reef
Lot 10518 on Plan 216093, Ocean Reef
Lot 15446 on Plan 40340, Ocean Reef

3. Area of Clearing

The Permit Holder must not clear more than 2.89 hectares of native vegetation within the areas cross-hatched yellow, red and green on attached Plan 8947/1a and Plan 8947/1b.

4. Period during which clearing is authorised

The permit holder must not clear any native vegetation after 3 November 2025.

5. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

PART II – MANAGEMENT CONDITIONS

6. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in 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.

7. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the 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.

8. Wind Erosion Management

The Permit Holder must commence construction no later than one (1) month after undertaking clearing authorised under this Permit.

9. Directional Clearing

The Permit Holder shall conduct clearing in a slow, progressive manner from one direction to the other (e.g. south to north) to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

10. Fauna Management

Pursuant to condition 10 of the Clearing Permit CPS 8788/1, the Permit Holder must submit to the *CEO* for approval a Fauna Management Plan, prepared in consultation with relevant authorities, which includes:

- (a) a plan for minimising the risk of death and injury to native fauna through vehicle strike along completed roadways;
- (b) a plan for the construction or installation of *conservation fencing* along the areas cross-hatched red that abut Bush Forever Site 325 on attached Plan 8947/1a following the completion of construction activities. *Conservation fencing* will allow for fauna movement by being raised at least 15 centimetres from the ground;
- (c) a table setting out the Permit Holder's commitments to the Plan's requirements; and
- (d) a program for monitoring compliance with the Permit Holder's commitments.

The Permit holder must implement and adhere to the approved Fauna Management Plan following approval by the *CEO*.

11. Revegetation and Rehabilitation

Within twelve (12) months of the commencement of clearing, the Permit Holder must engage an *environmental specialist* to prepare a plan, in consultation with relevant authorities, for the *revegetation* and *rehabilitation* of areas outlined under condition 11(a) and submit the plan to the *CEO* for approval. This plan will be in accordance with DWER's *A Guide to Preparing Revegetation Plans for Clearing Permits* and include, but not be limited to, the following:

- (a) specifications of the following areas to be *revegetated* and *rehabilitated* including:
 - (i) the area cross-hatched green on Plan 8947/1a, a total of 0.17 hectares, to be *revegetated* to Very Good (Keighery, 1994) condition or better;
 - (ii) areas cross-hatched light blue on Plan 8947/1a, Plan 8947/1b and Plan 8947/1c, a total of 4.67 hectares, to be *rehabilitated* to Very Good (Keighery, 1994) condition or better;

- (b) specifying an *optimal time* prior to 30 October 2025 in which the *revegetation* and *rehabilitation* identified under condition 11(a) will commenced, by way of:
 - (i) implementing hygiene protocols by cleaning earth-moving machinery of soil and vegetation prior to entering and leaving the *revegetation* and *rehabilitation* areas;
 - (ii) undertaking a *pre-planting* weed control program where required;
 - (iii) deliberately *planting* native vegetation and/or *direct seeding* or translocating native vegetation that will result in a similar species composition, structure and density to vegetation types in Very Good (Keighery, 1994) condition occurring in the adjacent vegetation;
 - (iv) ensuring *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the areas. In the event that *local provenance* material cannot be obtained, *locally endemic* species must be used;
- (c) specification to install educational signage to inform reserve users of the *revegetation* and *rehabilitation* activities being undertaken;
- (d) specifications to establish a suitable number of 5 x 5 metre quadrat monitoring sites within the areas of *revegetation* and *rehabilitation* specified under condition 11(a), and within adjacent vegetation in Very Good (Keighery, 1994) condition (reference sites), ensuring variations in vegetation types are accounted for;
- (e) include quantitative completion criteria, based on reference sites, which will capture species richness, density, cover, and structure, and weed and rubbish coverage;
- (f) a monitoring program for quadrats specified in condition 11(d) to be undertaken at least annually, and undertaken by an *environmental specialist*, capturing data to inform the completion criteria;
- (g) undertake *weed* control activities on an 'as needs' basis to maintain a weed coverage consistent with reference sites established under condition 11(d);
- (h) undertake remedial actions for *revegetation* and *rehabilitation* areas where monitoring indicates that these areas have not, or are not likely to meet the completion criteria, as specified under condition 11(e), including:
 - (i) further *revegetation* and *rehabilitation* by deliberately *planting*, translocating and/or *direct seeding* native vegetation seeds that will result in the minimum targets specified in the completion criteria, ensuring *local provenance* seeds and propagating material are used. In the event that *local provenance* material cannot be obtained, *locally endemic* species must be used;
 - (ii) undertaking further weed control activities;
 - (iii) undertaking watering activities; and
 - (iv) undertaking annual monitoring of each *revegetation* and *rehabilitation* areas, until the completion criteria specified under condition 11 (e) are met; and
- (h) where a determination by an *environmental specialist* that the completion criteria as specified under condition 11(e) has been met within the areas *revegetated* and *rehabilitated* through monitoring under condition 11(f) of this permit, that determination shall be submitted for the CEO's consideration. If the CEO does not agree with the determination, the CEO may require the Permit Holder to undertake additional works in accordance with the requirements under condition 11(i).

The Permit holder must implement and adhere to the approved Rehabilitation/Revegetation Plan following approval by the CEO.

PART III – RECORD KEEPING AND REPORTING

12. Record keeping

The Permit Holder must maintain the following records in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date(s) that the area was cleared;
- (c) the size of the area cleared (in hectares);

- (d) the direction that clearing occurred;
- (e) purpose for which the clearing was undertaken;
- (f) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit;
- (g) actions taken to minimise the risk of the introduction and spread of *dieback* and *weeds* in accordance with condition 7 of this Permit;
- (h) actions taken in accordance with the approved Fauna Management Plan, required by condition 10 of this Permit.
- (i) actions taken to *revegetate* and *rehabilitate* vegetation in accordance with condition 11 of this permit;

13. Reporting

- (a) The Permit Holder must produce the records required under condition 12 of this Permit when required by the *CEO*.
- (b) Prior to 30 July 2030, the Permit Holder must provide to the *CEO* a written report of records required under condition 12 of this Permit where these records have not already been provided under condition 13(a) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

conservation fencing means fencing installed for the purpose of conservation, with the intention to exclude unauthorised access without preventing the movement of fauna;

dieback means the effect of *Phytophthora* species on native vegetation;

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.

fill means material used to increase the ground level, or fill a hollow;

local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared;

locally endemic means plant species that have been recorded as naturally occurring within the City of Joondalup coastal foreshore

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;

optimal time means the period from May to August for undertaking planting;


planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

rehabilitate / rehabilitated / rehabilitation means actively managing an area containing native vegetation in order to improve the ecological function of that area.

revegetate / vegetated / revegetation 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.

weed/s means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*;
or
- (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



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SENIOR MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

9 October 2020

Plan 8947/1a

115°43'30.000"E

115°43'40.800"E

31°45'7.200"S

31°45'7.200"S

31°45'18.000"S


31°45'18.000"S



115°43'30.000"E

115°43'40.800"E

Legend

-  CPS areas subject to revegetation conditions
-  CPS areas subject to rehabilitation conditions
-  CPS areas subject to fencing conditions
-  CPS areas areas approved to clear
-  Land Tenure LGATE -226
-  Road Centrelines
-  Local Government Authorities



0 25 50 75 100 m



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MGA Zone 50
Geocentric Datum of Australia 1994

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Environmental Protection Act 1986



Plan 8947/1b

115°43'40.800"E

115°43'55.200"E

31°45'50.400"S

31°45'50.400"S

31°46'4.800"S






31°46'4.800"S



115°43'40.800"E

115°43'55.200"E

Legend

-  CPS areas subject to rehabilitation conditions
-  CPS areas areas approved to clear
-  Land Tenure LGATE -226
-  Road Centrelines
-  Local Government Authorities




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MGA Zone 50
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Environmental Protection Act 1986



Plan 8947/1c

115°43'12.000"E





31°44'9.600"S



31°44'9.600"S

115°43'12.000"E

Legend

-  CPS areas subject to rehabilitation conditions
-  Land Tenure LGATE -226
-  Road Centrelines
-  Local Government Authorities




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MGA Zone 50
Geocentric Datum of Australia 1994


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Environmental Protection Act 1986



Plan 8947/1d

115°42'0.000"E

115°42'14.400"E

31°34'19.200"S

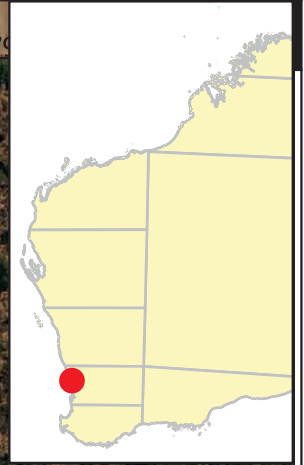
31°34'19.200"S

31°34'33.600"S

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LOT 55 ON PLAN 9474

LOT 502 ON PLAN 679



Road

LOT



CITY OF WANNEROO

Delicht Rd

115°42'0.000"E

115°42'14.400"E

Legend

-  Land acquisition area
-  Land TenureLGATE - 226
-  Road Centrelines
-  Local Government Authorities

Image



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MGA Zone 50
Geocentric Datum of Australia 1994

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Officer delegated under section 20 of the
Environmental Protection Act 1986



GOVERNMENT OF
WESTERN AUSTRALIA



Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 8947/1
Permit type:	Purpose Permit
Applicant name:	Western Australian Land Authority (Development WA)
Application received:	18 June 2020
Application area:	2.89 hectares (ha) of native vegetation
Purpose of clearing:	Building or Structure
Method of clearing:	Mechanical Removal
Property:	Lot 555 on Plan 402198, Iluka Lot 15446 on Plan 40340, Ocean Reef Lot 10518 on Plan 216093, Ocean Reef Lot 1029 on Plan 57604, Ocean Reef Lot 10098 on Plan 216093, Ocean Reef
Location (LGA area/s):	City of Joondalup
Localities (suburb/s):	Ocean Reef

1.2. Description of clearing activities

The proposed clearing is for 2.89 ha within a 3.05 ha envelope to support the terrestrial aspects of the proposed breakwater construction associated with the Ocean Reef Marina Development (the development), which includes:

- Access from Ocean Reef Road and haulage access to the northern outer breakwater structure;
- Access and haulage access to the southern outer breakwater structure and existing southern breakwater (to be removed) from the existing southern carpark area; and
- Northern stockpile area.

The vegetation applied to be cleared is depicted in Figure 1, Section 1.5.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	9 October 2020
Decision area:	2.89 ha of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Water and Environmental Regulation (DWER) on 18 June 2020. DWER advertised the application for public comment and 40 submissions were received.

In undertaking the assessment, and in accordance with section 51O of the EP Act, the Delegated Officer has given consideration to the Clearing Principles in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments, and any other pertinent matters deemed relevant to the assessment (see Section 3). Consideration of matters raised in the public submissions are summarised in Appendix B.

In particular, the Delegated Officer has determined that the proposed clearing will have a residual impact on the following environmental values:

- areas of vegetation with a high biodiversity;
- priority ecological communities;
- priority flora species;
- suitable habitat for conservation significant fauna species;
- suitable habitat for threatened flora species;
- ecological linkage function within proximity of the application area;
- an area considered significant as a remnant of vegetation in an extensively cleared landscape;
- direct clearing of conservation areas; and
- indirect impacts to adjacent conservation areas.

The Delegated Officer considers that the risk of land degradation can be suitably managed through the implementation of wind erosion management conditions, requiring that the activities associated with the purpose of the permit commence within one month of clearing, and through management measures proposed in the Construction Environmental Management Plan (CEMP) which requires approval under the City of Joondalup's Development Application approval conditions.

Impacts to fauna will be minimised through the implementation of a fauna management plan and conditions and requiring that directional clearing be conducted to facilitate movement of fauna into adjacent vegetated areas.

This clearing permit area is part of a wider development for the Ocean Reef Marina, a development encompassing 42 ha of land. A Metropolitan Region Scheme (MRS) amendment (1270/41) included the excision of 26.26 ha of Bush Forever Site 325 (WAPC, 2016). As part of the MRS amendment, WAPC required a Negotiated Planning Outcome (NPO) to secure an appropriate conservation outcome for the project (Strategen-JBS&G, 2020a). This included the acquisition of an offset site and the rehabilitation of Bush Forever areas adjacent to the application area.

The Delegated Officer determined that the measures outlined in the NPO were sufficient to mitigate the impacts of the proposed clearing within the excised Bush Forever to biodiversity, fauna habitat, impacts on adjacent conservation areas and impacts on suitable habitat for Threatened fauna species. As part of the NPO, an additional area of 3.3 ha of the Carabooda property was also purchased to offset any minor additional impacts to BF 325 as part of the detailed design stages of the development (e.g. road battering). A total of 0.085 ha of this additional land has been allocated to offset the impacts of the clearing of vegetation within Bush Forever Site 325 which does not fall within the MRS amendment. The Delegated Officer noted that plans required under the NPO have not yet been finalised and will require approval by the relevant authorities prior to undertaking development activities in accordance with planning approvals.

Additional rehabilitation requirements have been imposed on the clearing permit to counterbalance the loss of suitable habitat for Threatened flora species *Marianthus paralius*.

The Delegated Officer determined that the impacts on environmental values of the proposed clearing of 2.89 ha native vegetation within a 3.05 ha footprint for the proposed breakwater construction works associated with the Ocean Reef Marina development have been suitably minimised and mitigated through the NPO, management strategies proposed by the applicant and the conditions of the clearing permit.

1.5. Site map

Figure 1

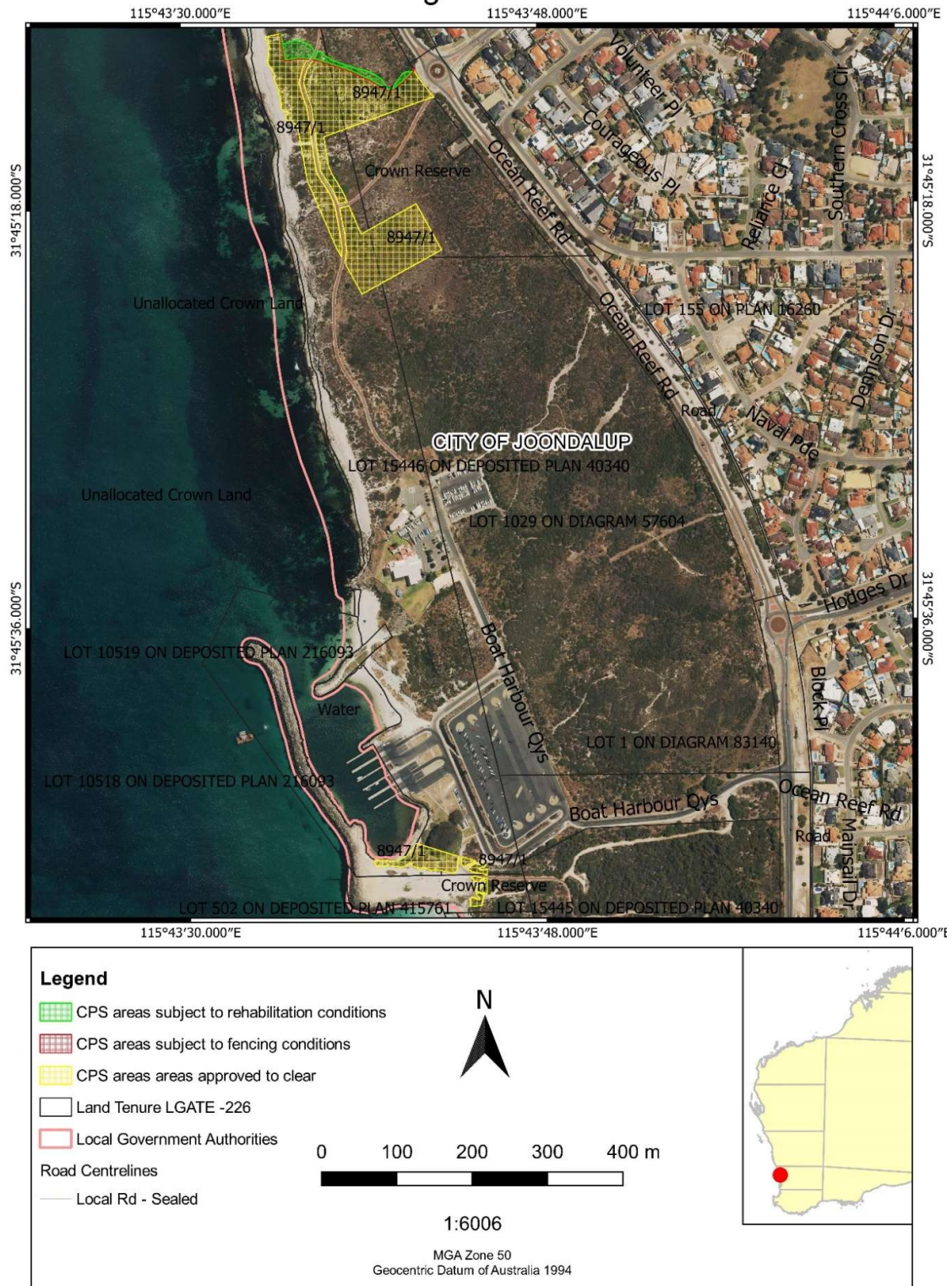


Figure 1. Map of the application area. The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit. The areas cross-hatched red indicates areas within which fencing conditions apply. The areas cross hatched green indicate areas which will be temporarily cleared and then revegetated.

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, the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

1. the precautionary principle;
2. the principle of intergenerational equity;
3. the principle of the conservation of biological diversity and ecological integrity; and

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)

Relevant policies considered during the assessment were:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- 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 has advised that the proposed clearing is within the development footprint of the proposed Ocean Reef Marina. As part of the rezoning of areas for the development of Ocean Reef Marina, under the Metropolitan Regional Scheme Amendment 1270/41, an NPO was prepared (Strategen-JBS&G, 2020a). This NPO includes onsite mitigation requirements, the acquisition of an offset site and the rehabilitation of degraded vegetation outside of the development area, and was endorsed by the Department of Planning, Lands and Heritage (DPLH), Department of Biodiversity, Conservation and Attractions (DBCA) and the Environmental Protection Authority (EPA) (refer to Section 3.3.1). A Rehabilitation Plan and a Construction Environmental Management Plan are required to be submitted and approved by relevant authorities prior to undertaking development activities under the relevant development approvals. In securing the land acquisition portion of the NPO, an additional 3.3 ha of land was acquired to mitigate minor clearing not within the scope of the NPO.

The MRS amendment boundary does not include 0.17 ha of native vegetation within the application area (green hatched area in Figure 1). The 0.17 ha of Bush Forever Site 325 proposed to be cleared will be rehabilitated following batter construction, with jute matting installed in the interim to reduce erosion (Strategen-JBS&G, 2020b). This revegetation has been applied as a mitigation credit in determining the offset requirements for this application. Based on the 1:1.5 ratio outlined in the State Planning Policy 2.8 (WAPC, 2010) and used for the NPO, 0.085 ha of the Carabooda offset site is required to counterbalance the removal of an additional 0.17 ha of vegetation from Bush Forever sSite 325. .

The proposed clearing of 2.34 ha of suitable habitat for *Marianthus paralius*, listed as Threatened under the BC Act, has been proposed to be mitigated through the identification and rehabilitation of areas of suitable habitat elsewhere in Bush Forever Site 325. A total of 4.67 ha of rehabilitation of suitable *M. paralius* habitat has been proposed, of which some areas may intersect areas of rehabilitation required under the NPO . These areas of rehabilitation include 0.67 ha directly adjacent to the development area, 1 ha surrounding a *M. paralius* population approximately 2 km north of the proposed clearing, and 3 ha located 350 metres south of the development area.

In addition to the NPO and above rehabilitation, the supporting documentation supplied by the applicant (Strategen-JBS&G, 2020b) outlined the following additional measures to minimise the impacts of the proposed clearing on environmental values:

- site inductions;

- establishing clearing boundaries through use of GPS and on-ground demarcation (inclusive of spoil stockpiles and access tracks);
- ensure vehicles are clean on entry;
- weed monitoring;
- seed and hygiene controls for equipment and personnel;
- accurate and well-maintained clearing records during and post-clearing;
- conservation fencing to allow ground dwelling fauna to pass underneath the mesh, and fauna sensitive road design will minimise the risk of impacts to fauna crossing the entrance roads;
- slow, directional clearing from non-vegetated areas to areas of remnant vegetation to allow for the movement of fauna into adjacent vegetation; and
- vehicle speeds on entrance roads and implement measures to minimise the risk of vehicle strike on fauna.

The applicant has advised that the CEMP conditioned under the development approval issued by the City of Joondalup will include measures to manage the anticipated direct and indirect environmental impacts. These measures may include, but are not limited to:

- implementation of erosion control measures including soil bunds and geotextiles;
- clear demarcation of clearing boundaries to minimise the risk of over or accidental clearing (inclusive of spoil stockpiles and access tracks);
- use of existing roads and access tracks to access the site;
- inclusion of buffer zones to minimise the risk of over or accidental clearing;
- seed, weed and hygiene controls for equipment and personnel; and
- accurate and well-maintained clearing records during and post clearing.

In addition to the above measures, the applicant has advised that fauna relocation prior to clearing will be undertaken (DevelopmentWA, 2020).

3.2. Assessment of environmental impacts

In assessing the application in accordance with section 51O of the EP Act, the Delegated Officer has examined the application and site characteristics (Appendix C) and considered whether the clearing poses a risk to environmental values. The assessment against the Clearing Principles is contained in Appendix D.

This assessment identified that the clearing may pose a risk to biological values, significant remnant vegetation and conservation areas, and land and water resources, and that these required further consideration. The detailed consideration and assessment of the clearing impacts against the specific environmental values is provided below. Where the assessment found that the clearing presents a risk to environmental values, conditions aimed at controlling and/or ameliorating the impacts have been imposed under sections 51H and 51I of the EP Act. These are also identified below.

3.2.1 Environmental value: biological values (flora) – Clearing Principles (a), (c) and (d)

Assessment: A range of flora and vegetation surveys have been conducted within the development area including; Mattiske Consulting - *Flora and Vegetation Assessment of Lot 1029 and Bushplan Site 325* (2000), Bowman Bishaw Gorham - *Vegetation and Flora Assessment Pt Lot 1029, Lots 1032 and 1033 Ocean Reef Road* (2002), Natural Area Management Services (NAMS) - *Vegetation Condition, Ecological Community and Flora Search* (2008), SMEC Australia Limited & Natural Area Management Services - *Additional Flora Survey, Northern Portion of Proposed ORM Development Site* (2009) and Mattiske Consulting - *Level 2 Flora and Vegetation Survey of the Proposed Ocean Reef Marina Survey Area* (2013). Strategen-JBS&G also undertook a walkover of the Proposal site during spring in 2019 for the purpose of confirming vegetation mapping boundaries and vegetation condition mapping from the Mattiske Consulting (2013) survey. The results indicated minor changes to the vegetation community mapping of Vegetation Types (VTs) S4 and H4.

Strategen-JBS&G (2020b) undertook a site visit in May 2020 to assess the likelihood of *Grevillea* sp. Ocean Reef occurring in other areas of the Ocean Reef vegetation within and adjacent to the development area. The results of the targeted survey within areas of suitable habitat (*Acacia* shrubland on inter dune swales) within the proposed clearing areas recorded no additional occurrences of *Grevillea* sp. Ocean Reef (Strategen-JBS&G, 2020b).

Based on the surveys undertaken within the proposed clearing area (outlined in Appendix C) and adjacent vegetation (Natural Area, 2019), it was determined that the proposed clearing area has high floristic diversity. Although the proposed clearing area has suitable habitat for a range of conservation significant flora species, sufficient surveys have been undertaken to determine whether the majority of these species are present. However, it was determined that two species have not been adequately surveyed for *Stylidium maritimum* (Priority 3) and *Lecania turicensis* var. *turicensis* (Priority 2).

The P3 *Styloidium maritimum* has been recorded approximately 8.7 kilometres to the north of the application area. This species was not targeted during the Mattiske Consulting (2013) survey or desktop assessment as the local record was not identified until 2015. *Styloidium maritimum* has an extended range of 376 km along the Western Australian coast in a variety of habitats that include dune systems, flats, limestone, and open Banksia woodland (WAH 1998-). Proposed clearing is unlikely to impact on the conservation status of this species if it were to be located within the application area.

The P2 *Lecania turicensis* var. *turicensis* is a lichen variety that has been recorded on coastal limestone rocks at one location within the local area, approximately 3 km to the north at Burns Beach (another record is located further north, outside the local area, at Yanchep). Previous surveys over the application area, consistent with EPA guidance (EPA, 2016), considered vascular flora, and as such lichenised fungi were not within the scope of the surveys undertaken. *Lecania turicensis* is a widely distributed species in most temperate regions of the globe including Europe, northern Africa, western Asia and North America (Kirk *et al.* 2008; Nash *et al.* 2004), and is known from five states of Australia (ALA 2020; McCarthy 2006). *Lecania turicensis* is a variable species (Nash *et al.* 2004), with the variety *Lecania turicensis* var. *turicensis* also recorded from New Zealand (NZPCN 2020). It is likely that locations of *Lecania turicensis* var. *turicensis* are under-represented in databases. The majority of the application area consists of coastal sand dunes that does not provide suitable habitat. Approximately 110 metres of the application area intersects coastline with rocky limestone substrate. The clearing of native vegetation within this section of the application area is unlikely to compromise the conservation status of this lichen variety.

One conservation significant flora species has been recorded within the proposed clearing area, *Conostylis bracteata* (Priority 3). A total of 127 individuals were recorded within the proposed clearing, at three of the seven quadrats. The total survey area recorded a total of 815 individuals at 14 locations (Mattiske Consulting, 2013). A population census of this species was not undertaken, however, it was noted that in addition to individuals recorded within quadrats this species was common in vegetation community S2 and H2, which are mapped over 0.285 ha of the proposed clearing. Additionally, of the 815 individuals recorded at 14 locations, 548 (at 9 locations) are located within Bush Forever Site 325, which is proposed to be retained. Given the relative abundance of the species in adjacent vegetation within Bush Forever tenure, the proposed clearing will not impact on the conservation status of the species.

Two species of flora listed as Threatened under the *Biodiversity Conservation Act 2016* have been recorded in the local area, *Eucalyptus argutifolia* (Vulnerable) and *Marianthus paralius* (Endangered). It was determined that the habitat is suitable for both species, however, sufficient survey efforts have been undertaken to confirm that individuals are not present within the proposed clearing area.

The conservation advice for *E. argutifolia* indicates suitable habitat to be slopes or gullies close to the summit of limestone ridges where soils are shallow, well drained and grey with outcrops of limestone (DEWHA, 2008). Vegetation in association includes heath of Parrot bush (*Banksia sessilis*) and Chenille Honey-myrtle (*Melaleuca huegelii*) (Grayling & Brooker, 1992; Brown *et al.*, 1998; DEC, 2008). This vegetation and soil type has some consistencies with vegetation communities mapped within the proposed clearing area (namely S1, S2, and S3), however, these communities comprise a small portion of the application area (0.25 ha). It was determined that the proposed clearing of a small area of suitable habitat with no confirmed individuals is not likely to be significant or compromise the conservation status of this species.

The majority of the application area (2.34 ha) is mapped as community type H1, which is consistent with the habitat requirements for *Marianthus paralius*. The Interim Recovery Plan for *M. paralius* outlines that habitat suitable for the species are “areas of similar habitat surrounding and linking populations (these providing potential habitat for population expansion and for pollinators), additional occurrences of similar habitat that may contain undiscovered populations of the species or be suitable for future translocations” (DEC, 2009). There are three recorded populations of *M. paralius*, one of which is located 1.9 km north of the proposed clearing area. It was determined that all the vegetation mapped as the H1 community within the proposed clearing area, 2.34 ha in total, is consistent with the suitable habitat for *M. paralius* (DEC, 2009; DBCA 2020a). Of that, 0.13 ha comprises H1 vegetation type which is within batter areas of the Bush Forever site which will be revegetated *in situ* (Strategen-JBS&G 2020g). A total of 3 ha of vegetation consistent with suitable habitat for *M. paralius* is proposed to be impacted across the three clearing permits. To mitigate the impacts to suitable habitat, rehabilitation of suitable habitat at a ratio of 1:1 is considered appropriate to mitigate impacts to habitat for this species.

The applicant has identified 4.67 ha of suitable *Marianthus paralius* habitat in which rehabilitation activities will be undertaken:

- 0.67 ha directly adjacent to the development area;
- 3 ha approximately 350 metres south of the development area; and
- 1 ha approximately 2 km north of the application area surrounding an existing population of *M. paralius*.

The location of the rehabilitation of suitable *M. paralius* habitat is outlined by the areas shaded light blue on Plan 8947/1a, Plan 8947/1b and 8947/1c.

The flora and vegetation survey undertaken in 2013 (Mattiske Consulting, 2013) identified that the vegetation within the development and surrounds had consistencies with three Priority 3 ecological communities:

- Coastal shrublands over shallow sand, southern Swan Coastal Plain (SCP 29a), of which 2.5 ha is mapped within the application area;
- Acacia shrublands on taller dunes, southern Swan Coastal Plain (SCP29b), of which 0.26 ha is mapped within the application area; and
- Northern Spearwood shrublands and woodlands (SCP 24), of which 0.05 ha is mapped within the application area.

Although it was noted that species richness was lower than reference sites for these communities, in supporting documentation the methodology of quadrat sampling was not consistent with the reference sites sampled over multiple seasons (Strategen-JBS&G, 2020b; Gibson *et al.* 1994). As such, this cannot be used as an indication that these are not a representation Priority Ecological Communities (PECs). The proposed clearing has been assessed as impacting the Priority 3 FCT's; SCP 24, SCP 29a and SCP 29b. Based on the small area of SCP29b and SCP24 proposed to be cleared, the impacts to these communities were not assessed as being significant. Adequate demonstration has been provided that these impacts were considered under the NPO and associated offsets which are discussed under section 3.3.1.

A review of vegetation mapping within the development area was undertaken in 2019 which identified a 0.08 ha patch of tuart woodland within the proposed clearing area, which was also noted during the DWER site inspection (Strategen-JBS&G, 2020b; DWER, 2020). Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community was listed as a Critically Endangered Threatened Ecological Community (TEC) under the EPBC Act in 2019. Following its inclusion in the Commonwealth priority assessment list in November 2016, the Tuart ecological community was recognised by the Western Australian Government and listed by DBCA as a Priority 3 ecological community (DBCA, 2017). The Mattiske Consulting (2013) survey therefore preceded the listing of this ecological community. Based on the size of the patch (less than 0.5 ha), in consideration of the listing advice of DEE (2019) it is not considered representative of the nationally protected TEC. No detailed floristic analysis of the species composition within the patch has been undertaken, however, adopting the precautionary principle the patch is considered Priority 3 Tuart Woodland listed by DBCA. Based on the size of this community proposed to be cleared, and the large area of Tuart Woodland in the offset site, the impacts were not considered significant.

In summary, the significant residual impacts of the proposed clearing to flora and biodiversity values are:

- 1) 2.89 ha of area with high flora and fauna biodiversity;
- 2) 2.89 ha of area that provides an important ecological linkage in the landscape;
- 3) 2.5 ha of Coastal shrublands over shallow sand, southern Swan Coastal Plain, listed as Priority 3 under the BC Act
- 4) 2.34 ha of habitat consistent with listed suitable habitat for threatened flora species *Marianthus paralius*.

Adequate demonstration has been provided that impacts in relation to 1) to 3) above were considered under the NPO and associated offsets which are discussed under section 3.3.1.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions to be imposed on the clearing permit (see below) and mitigation through other planning matters (NPO) in relation to these environmental values.

Conditions: To address the above impacts, the following conditions will be added to the permit:

Rehabilitation and revegetation:

-
- revegetation of the 0.17 ha of vegetation within Bush Forever Site 325 proposed to be cleared;
- rehabilitation of 4.67 ha suitable habitat for *Marianthus paralius*.

3.2.2 Environmental value: biological values (fauna) – Clearing Principle (b)

Assessment: Based on the available information, the application area was determined to be suitable for a range of fauna species. The application area lies within the City of Joondalup's Coastal bushland zone, which has been identified as an important habitat for a variety of reptile species (City of Joondalup, 2014). A fauna survey undertaken in adjacent areas identified 35 native vertebrates and 35 native invertebrate fauna species (Natural Area, 2019). Because this survey was undertaken in adjacent areas it provides relevant information which is indicative of the fauna

diversity within the application area. A site inspection undertaken by DWER staff in the wider development area noted a range of bird species including the migratory species Rainbow Bee-eater (*Merops ornatus*), as well as passerine species now uncommon in the metropolitan area such as the White-browed (Spotted) Scrubwren (*Sericornis frontalis*) and fairy-wrens (*Malurus sp.*) and the northern sub-population of the White-breasted Robin (*Eopsaltria georgiana*) very close to the southern extent of its range (DWER, 2020; DBCA, 2007-).

As a large remnant patch of vegetation, the application area provides habitat for species that require larger space requirements. It is recognised that larger sized remnants have higher diversity and are more resilient to change (MacArthur and Wilson, 1967; Lawrence *et al.* 2018). Larger patches of remnant vegetation are also important for providing core habitat areas necessary to support species that cannot persist in smaller areas, and may act as refugia (Davis 2009; Hopper *et al.* 1996; Kitchener and How, 1982; DER, 2014 Reside *et al.* 2013).

In particular, it was determined that the application area contains potential habitat for eleven conservation significant fauna species. Of these species, five are either predominantly marine/estuarine or wading species that have very wide distributions and the removal of native vegetation will not likely be significant (Appendix C). The predominantly aerial and migratory Fork-tailed Swift (*Apus pacificus*), as well as the Peregrine Falcon (*Falco peregrinus*) (other specially protected fauna) may overfly the application area without utilising any particular habitat present (Appendix C).

Four species have a more restricted distribution and it was determined that the proposed clearing may impact on these conservation significant species:

- Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Endangered;
- Black-striped Snake (*Neelaps calonotos*), Priority 3.
- Quenda (*Isoodon fusciventer*), Priority 4;
- Graceful Sun Moth (*Synemon gratiosa*), Priority 4;

There is a confirmed breeding site for Carnaby's Cockatoo 3.8 kilometres from the application area and a confirmed night roosting site 1.1 kilometres from the application area. Any potential foraging resources within the application area may therefore be considered significant to support roosting and/or breeding populations (Commonwealth of Australia 2017; EPA 2019b). Surveys to confirm the extent of foraging habitat within the wider development footprint were undertaken in 2008 and 2014; these surveys did not identify foraging potential within the proposed clearing area (Western Wildlife, 2008; Strategen, 2014).

Banksia sessilis is recognised as an important foraging resource for Carnaby's Cockatoo in coastal habitat on the Swan Coastal Plain (Valentine and Stock, 2008; Groom, 2011). Other species noted within the application area that may provide marginal foraging habitat include *Acacia saligna* and *Allocasuarina* spp., however, these are considered low quality (Valentine and Stock, 2008; Groom, 2011). Of the vegetation communities mapped within the proposed clearing area, the majority (81 per cent) is coastal heathland within which *B. sessilis* was not recorded. A total of 0.28 ha of vegetation (or 9.7 per cent of the application area) is mapped as communities within which *B. sessilis* was recorded; all of which had a low cover (that is below 10 per cent) of this species. Assuming 10 per cent cover of *B. sessilis* in these communities, a maximum of 280 m² of black cockatoo foraging habitat is proposed to be cleared. Given the lack of abundant foraging species, and small scale of black cockatoo foraging habitat to be removed (0.028 ha), the proposed clearing is not considered to significantly impact on the availability of foraging resources within the local area. The impact of the wider development on black cockatoo species was also considered as part of the NPO.

There is a known population of Graceful Sun Moth within Ocean Reef foreshore. This moth is associated with *Lomandra maritima*, which was recorded predominately in the mapped heathland communities (Mattiske Consulting, 2013). Surveying in 2009 and 2010 confirmed the presence of this species within the development area. The Graceful Sun Moth is currently categorised as a Priority 4 conservation significant fauna species; it had been listed as an Endangered species in 1997, however, was delisted in 2012 (WA) and 2013 (Cwth) after extensive survey efforts identified populations along coastal vegetation from Kalbarri to Binningup. The dispersal of this species is very limited, with dispersal across unsuitable habitat extremely uncommon (TSSC, 2013). It was determined that due to the size of the proposed clearing and the disruption of a continuous patch of vegetation, the impacts to population connectivity and overall population size may be impacted (DBCA, 2020b). However, based on the confirmed presence of individuals located at Ocean Reef outside of the development area and suitable habitat outside of the development area, the proposed clearing is not likely to have a significant impact on this overall viability of this population (DBCA 2020b). It was determined that the proposed clearing is unlikely to impact on the conservation status of this species. It is noted that *Lomandra maritima* will be incorporated in the suite of species being used for the rehabilitation portion of the NPO in adjacent vegetation.

Quenda have been recorded in similar vegetation communities adjacent to the development area. There are records of Quenda within close proximity of the offset site, with the closest being 1.2 km to the south. While the survey did not

observe the characteristic diggings of this species within the application area, it is considered highly likely that this species occurs within the area (Western Wildlife, 2008). The species is widely distributed near the south-west coast, from Guilderton north of Perth to east of Esperance (DEC, 2012). Due to the known range and wide population distribution, it was determined that the proposed clearing of 2.89 ha of suitable habitat would not significantly impact the conservation status of the Priority 4 species, however, the disruption of a patch of contiguous suitable habitat may lead to local population fragmentation. This issue has been further addressed in Section 3.2.3.

The Black-striped Snake is a small fossorial venomous snake, restricted to the sandy coastal strip near Perth, between Mandurah and Cataby, with isolated populations further north near Eneabba and Dongara. Habitat for this species includes *Eucalyptus* and/or *Banksia* woodlands and dunes and sand plains vegetated with heaths (Wilson and Swan, 2017). Habitat is present over the application area and this species was considered as part of the NPO. The land acquisition at the Carabooda offset site provides 26 ha of suitable habitat. There are records of the Black-striped Snake within close proximity of the offset site, 2.8 km to the north within Yanchep National Park.

In summary the significant residual impacts of the proposed clearing on fauna habitat are:

- 1) 2.89 ha of highly diverse habitat suitable for fauna which is also significant as a remnant of vegetation within the local area; and
- 2) North-south ecological linkage disruption through the clearing of native vegetation of a minimum of 30 metres in width.

Adequate demonstration has been provided that impacts in relation to 1) above was considered under the NPO and associated offsets which are discussed under section 3.3.1. The rehabilitation plan under the NPO commits to 5 ha of revegetation within Bush Forever Site 325 (Strategen-JBS&G 2020h) which will assist in mitigating impacts to the ecological linkage.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions (see below) and mitigation through other planning matters (NPO) in relation to this environmental value.

Conditions: To minimise and mitigate the impacts on fauna and associated habitat, the following conditions have been added to the permit:

- Implementation of directional clearing whereby slow, directional clearing of remnant vegetation will allow for the movement of fauna into adjacent vegetation.
- Preparation and implementation of a fauna management plan (FMP) to be submitted for approval by the CEO of DWER (or delegate). The FMP is to be developed in consultation with Main Roads Western Australia and the City of Joondalup and implemented following the approval by DWER to minimise the risk of vehicle strike along completed roadways.
- Installation of conservation style fencing to mitigate disruption to ecological linkages and allow for fauna movement between adjacent vegetated areas.

3.2.3 Environmental value: 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 prior to the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The EPA has a modified objective to retain at least 10 per cent of the pre-clearing extent of vegetation complexes for defined constrained areas (intensely developed), namely the Perth and Bunbury Metropolitan Region (EPA, 2008).

The local area retains 21 per cent of the original vegetation extent; although this is below the 30 per cent retention outlined nationally, it is above the 10 per cent objective for the Perth Metropolitan Region. The City of Joondalup retains approximately 11.8 per cent of its original vegetation extent, with a larger proportion of remnant vegetation within the local area (compared to that which remains with the City) due to the large portions of Bush Forever sites to the north of the application area within the City of Wanneroo (sites 322 and 323) and Neerabup National Park. Considering the high level of clearing within the City of Joondalup, the vegetation within the proposed clearing area may be considered within an extensively cleared landscape.

Although the vegetation extent within the local area and vegetation complex is above the EPA's recommended 10 per cent threshold for the Perth Metropolitan Region, it was determined that the application area is located in an area of vegetation that is considered a significant remnant. The majority of remnant vegetation patches in the local area exist as small fragments; large patches of remnant vegetation, such as Ocean Reef Foreshore that the proposed clearing is located in, are important for providing core habitat areas necessary to support species that cannot persist

in smaller areas (Kitchener *et al.*, 1982; DER, 2014). Additionally, the application area provides an important ecological linkage in the Perth Metropolitan Region, which will be interrupted as a result of the proposed clearing.

The application area forms part of the Gnangara Sustainability Strategy Ecological Linkages, a conceptual linkage of areas of vegetation throughout the Gnangara groundwater system (Brown *et al.*, 2009). The application area forms part of 14 kilometres of intact vegetation along the foreshore from Hillarys to Mindarie. Vegetation along the coastline forms an essential part of this conceptual linkage and coastal linkages are a priority for nature conservation in the area (Brown *et al.*, 2009). A high proportion of these coastal vegetation complexes have been cleared for urban development and are under development pressure (Brown *et al.*, 2009). The proposed clearing will lead to the fragmentation of this linkage with a minimum width of 30 metres of cleared vegetation from Ocean Reef Drive to the coastline, approximately 170 metres long (Figure 1). The disruption of vegetation will impact the movement of fauna species through the landscape and may fragment flora and fauna populations which has the potential to reduce gene flow and create inbreeding depression, reducing the resilience of species.

Impacts to this linkage will be minimised through the retention of a north-south linkage of remnant vegetation between Ocean Reef Road and the proposal area, with the exception of entry roads (Strategen-JBS&G, 2020b). DWER imposed conditions on a previous permit (CPS 8788/1) requiring the permit holder to install conservation fencing, with the intent of the condition being to restrict public access, while allowing for fauna movement across the areas (such as conservation fencing used elsewhere along the coastline). A condition was also imposed requiring the development of a fauna management plan (FMP) which would include measures to be implemented to reduce vehicle speed and increase driver awareness to minimise the risk of vehicle strike on fauna. The same conditions have been placed on this clearing permit.

The majority of the application area was previously part of Bush Forever Site 325 until the gazettal of Metropolitan Region Scheme Amendment 1270/41, which rezoned areas to facilitate the development of the Ocean Reef Marina, and included the removal of 26.26 ha of Bush Forever (WAPC, 2016). Within the proposed clearing area, due to a minor alteration in the development envelope, 0.17 ha of vegetation was not excised under the MRS scheme and is still listed as Bush Forever.

An additional area of 3.3 ha of the Carabooda offset property was purchased to offset any minor additional impacts to BF 325 as part of the detailed design stages of the development such as road battering (Strategen-JBS&G, 2020b). Using the 1:1.5 ratio, outlined in the SPP 2.8 (WAPC, 2010) and applied in determining the NPO offset, and applying a mitigation credit for the revegetation of this area, a total of 0.085 ha of the additional land acquired is allocated to offset the 0.17 ha impact to Bush Forever Site 325, not considered within the scope of the NPO. Additional clearing outside of the MRS boundary under a previous clearing permit (CPS 8788/1) have been mitigated through 2.655 ha of this additional land acquisition. With consideration of the 0.085 ha allocated under this clearing permit, a total of 0.56 ha within the offset site remains unallocated for incidental clearing. Advice was received from the Department of Planning, Lands and Heritage (DPLH) in relation to the clearing proposed under CPS 8947/1, indicating there are no objections to the clearing. This advice reiterated conditions related to the provision and subsequent approval of a rehabilitation strategy for the 5 ha of adjacent bushland (discussed in section 3.3.1), and the development and implementation of a CEMP. Both of these are requirements of the NPO.

The proposed clearing will decrease the area to perimeter ratio of the adjacent conservation areas. Area to perimeter ratio is an important factor in the diversity and resilience of remnant vegetation (Helzer & Jelinski, 1999; Stenhouse, 2004) and was considered in the land acquisition portion of the NPO. Area to perimeter ratio is also important factor in determining the potential indirect impacts to a conservation area including weed abundance and diversity, changes to adjacent vegetation composition, and further human impacts such as rubbish dumping and unauthorised access more likely in areas with a lower area to perimeter ratio. Although the majority of the application area is no longer part of the Bush Forever site, the proposed clearing will potentially impact the adjacent conservation area through an increase in the potential for weed and disease invasion, unauthorised access, accidental clearing and erosion impacts. The impacts to ecological linkage disruption will also likely have an impact on this conservation area.

In summary, the significant impacts of the proposed clearing on conservation areas and significant remnant vegetation are:

- 1) 2.89 ha of remnant vegetation that is significant as a remnant of vegetation within the local area;
- 2) North-south ecological linkage disruption through the clearing of native vegetation of a minimum of 30 metres in width;
- 3) Impacts to Bush Forever Site 325 including:
 - o The clearing of 0.17 ha of Bush Forever Site 325.
 - o Ecological linkage disruption.
 - o Reduction in area to perimeter ratio, which increases the likelihood of the indirect impacts listed below.

Potential indirect impacts of the clearing include:

- Introduction or spread of weeds.
- Introduction or spread of dieback.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions (see below) and mitigation through other planning matters (NPO) in relation to this environmental value.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- Revegetation of the 0.17 ha of vegetation within Bush Forever Site 325 proposed for clearing for road batters
- Implementation of weed and dieback mitigation strategies
- Installation of conservation style fencing to mitigate disruption to ecological linkages and allow for fauna movement between adjacent vegetated areas.

3.2.4 Environmental value: land and water resources – Clearing Principles (f), (g), (i) and (j)

Assessment: Due to the coastal location of the proposed clearing area, the importance of native vegetation in dune stabilisation is an important factor when considering erosion risk and impact. In winter, when there is higher rainfall and wind speeds, the likelihood of land degradation increases. Due to the associated soil types, the proposed clearing has a high risk of wind and water erosion. These erosion issues may lead to impacts on adjacent conservation areas (as outlined in section 3.2.3). Given the porous nature of the sandy soils over limestone bedrock and the coastal location, the application area is a very low risk of flooding or waterlogging.

Standard construction methodologies and a wind erosion management condition will mitigate any long-term wind erosion impacts. The applicant has advised that the clearing will be undertaken no more than one month prior to the commencement of works, which will reduce the risk of wind and water erosion. Other measures which are proposed to be included in the CEMP include:

- dust suppression measures to avoid erosion and impacts to surrounding vegetation;
- stockpiling protocols to avoid dust/ spread of weeds etc. into surrounding areas;
- maximum timeframes for exposed sand surfaces (i.e. areas will not be left cleared and undeveloped for an extended period of time).

The minimisation and mitigation measures outlined above, the CEMP requirements outlined in the NPO, and the inclusion of a wind erosion management condition on the permit to reduce time periods in which cleared areas can remain undeveloped, will suitably mitigate the risks of appreciable land degradation.

The original site description inferred that the vegetation within Bush Forever Site 325 included Floristic Community Type (FCT) 16 - *Highly saline seasonal wetlands (Frankenia pauciflora Low Shrubland on Tamala Limestone Cliffs)* (Bush Forever, 2000) with *Frankenia pauciflora* a dominant component.

The recent review of the vegetation mapping within the application area (Strategen-JBS&G 2020b) indicated that *Frankenia pauciflora* is also a component of the H1 vegetation type, covering 2.34 ha of the application area. Proposed clearing therefore could potentially remove vegetation associated with a wetland and may therefore be at variance to principle (f).

Full vegetation descriptions are available in Appendix F. *Frankenia pauciflora* is a dominant component of FCT 16 but is a small component, and not the dominant understory species, within the H1 vegetation type occurring over the application area. FCT 16 was mapped on shallow soils over limestone (Bush Forever, 2000), a landform that is common throughout Bush Forever Site 325, and it could be assumed that *Frankenia pauciflora* would be located elsewhere in the remaining vegetated portions of Bush Forever Site 325 and impacts to this wetland associated vegetation are unlikely to be significant.

Outcome: Based on the above assessment, the Delegated Officer has determined that the proposed clearing is considered acceptable subject to relevant conditions (see below) and mitigation through other planning matters (NPO) in relation to this environmental value.

Conditions: To address the above impacts, the following conditions will be added to the permit:

- No clearing of native vegetation unless construction activities commence within one month of the authorised clearing being undertaken to ensure that wind erosion does not remove topsoils or create dunal blow outs.

3.3. Relevant planning instruments and other matters

To enable the commencement of works in 2020, in accordance with the State Government commitment, the applicant has submitted clearing for preliminary works associated with the development. Two clearing permits to facilitate geotechnical investigations (CPS 8787/1) and an early works program (CPS 8788/1) associated with Ocean Reef

Marina development have been previously granted by DWER. Both determinations were appealed, with the Minister for Environment making a determination on 1 July 2020 that all grounds of appeal be dismissed (Minister for Environment, 2020).

The marine portion of the Ocean Reef Marina development was assessed by the EPA under Section 38 of the *EP Act*, with Ministerial Statement 1107 issued on 7 August 2019 (EPA, 2019a). It is noted that the proposed clearing is associated with the marine component of the development, namely breakwater construction, and compliance with Ministerial Statement 1107 will be managed by the EPA.

An Improvement Plan for the Ocean Reef Marina development (Improvement Plan 51) was gazetted 31 December 2019 to facilitate land use planning and development. A draft Improvement Scheme for the area was submitted to WAPC in December 2019, with the assessment still in progress; it is expected to be finalised in late 2020 (Strategen-JBS&G, 2020b). In a meeting held on 24 April 2020, the Joint Development Assessment Panel (JDAP) granted two separate development approvals for the proposed breakwater construction (DAP20/01755 & DAP20/01756) for:

- the portion of works located on land reserved for 'Parks and Recreation' and 'Waterways' under the MRS; (WAPC); and
- the portion of works located on land zoned 'Urban' under the MRS (City of Joondalup).

A third development application, applicable to the northern batters which extend into Bush Forever Site 325 has also been approved by the WAPC (Strategen-JBS&G, 2020i).

These development approvals included conditions relating to the management of environmental risk including:

- a Construction Management Plan shall be submitted to, and approved by the City (and be prepared to the satisfaction of the WAPC) prior to the commencement of development. The Construction Management Plan shall detail how it is proposed to manage:
 - all forward works for the site;
 - the delivery and storage of materials and equipment to the site;
 - the parking arrangements for the contractors and subcontractors;
 - the protection of vegetation outside the development area;
 - the management of dust;
 - the management of noise;
 - construction signage;
 - potential conflict points between pedestrians and construction traffic;
 - communication with surrounding residents prior to commencement of works and during construction.
- works shall be undertaken in accordance with the approved Construction Management Plan.
- all works shall be contained within the development footprint, as indicated on the approved plans.

Comments received from the City of Joondalup highlight the conditions imposed under the development approvals and note that the City will collaborate with the proponent in development of the Construction Management Plan (City of Joondalup, 2020). The City of Joondalup support this clearing permit application.

Advice was received from the Department of Planning, Lands and Heritage (DPLH) in relation to the clearing proposed under CPS 8947/1, indicating there are no objections to the clearing. This advice reiterated conditions related to the provision and subsequent approval of a rehabilitation strategy for the 5 ha of adjacent bushland (discussed in section 3.3.1), and the development and implementation of a CEMP. Both of these are requirements of the NPO.

The application area is located within the boundaries of the Swan River People 2 Native Title Registered Claim (WAD24/2011), and the Whadjuk People Indigenous Land Use Agreement (WI2017/015). The wider development area has been subject to five Aboriginal heritage surveys, which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

3.3.1 Negotiated Planning Outcome (NPO)

The proposed clearing is part of a wider development of the area for the Ocean Reef Marina, a development encompassing 42 ha of land. A Metropolitan Region Scheme (MRS) amendment (1270/41) to facilitate this development was initiated in 2014 and gazetted in November 2019 (WAPC, 2016). This amendment included the excision of 26.26 ha of Bush Forever Site 325, of which 16.79 ha remains vegetated. One of the outcomes of this amendment was the requirement of anNPO to counterbalance the impacts of the proposed development on environmental values (Strategen-JBS&G, 2020a). In the process of the MRS amendment, the development was referred to the Environmental Protection Authority (EPA), which determined that the amendment did not require formal assessment, and that the terrestrial aspects could be managed through other processes (EPA, 2014). The

other processes mentioned refer to a clearing permit under Part V of the EP Act, development application from the City of Joondalup and implementation of the NPO. The marine component of this development was assessed by the EPA (EPA, 2019a).

The NPO outlined the following key impacts to Bush Forever Site 325:

- clearing of 16.79 ha of vegetation in varying condition from Degraded to Excellent;
- removal of Priority 3 flora species *Conostylis bracteata*;
- clearing of vegetation in association with inferred Priority Ecological Communities (PECs);
- partial interruption of north-south linkage values;
- loss of habitat for fauna species; and
- potential for indirect impacts on the remaining BF 325 through introduction and spread of weeds, dust generation during earthworks and increased incidence/frequency of fire.

The NPO included measures to mitigate and offset the impacts of the outlined above, which included the requirement for the acquisition of land, the rehabilitation of areas adjacent to the development, and onsite mitigation measures.

Land acquisition

The western 22.7 ha of Lot 51 Walding Road, Carabooda was purchased for the land acquisition portion of the NPO (Figure 2). An additional 3.3 ha was secured to mitigate any additional minor clearing to areas outside the development envelope, with a total of 26 ha of land acquired. The Lot has approximately 48 ha of remnant vegetation and is located adjacent to Yanchep National Park a Class A nature reserve. It is planned to be vested into conservation estate. It was determined by the applicant that the offset site meets or partially meets the site selection criteria as outlined by the *State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region* (SPP 2.8) (WAPC, 2010; Strategen-JBS&G, 2020a).

The acquisition of this land as an offset was endorsed by the EPA, DBCA and DPLH (Strategen-JBS&G, 2020a). The area contains similarities in floristic community types, however, is not “like for like”; it was determined to be as ‘similar as practicable’ in accordance with the State’s *Environmental Offsets Policy* (2011). It was determined that the offset site has higher environmental values due to the presence of conservation significant flora and the presence of Threatened Ecological Communities (TECs). A site inspection undertaken by DWER staff also identified the presence of high quality black cockatoo foraging and breeding habitat throughout the majority of the site, however this has not been quantified (DWER, 2020a). The site inspection also noted *Lomandra maritima*, indicating that the site may be suitable habitat for the Graceful Sun Moth, however, this has not been quantified (DWER 2020a). In making a determination on appeals against clearing permits CPS 8787/1 and CPS 8788/1, the Minister for Environment considered that the application of the NPO as an offset for the significant residual impacts associated with the clearing was appropriate (Minister for Environment, 2020).

As the land acquisition associated with the NPO included an additional 3.3 ha, it is considered appropriate that this additional area be used to offset the areas to be cleared under this application which are not within the MRS amendment boundary. Based on the 1:1.5 ratio outlined in the SPP 2.8 (WAPC, 2010) and applied in determining the NPO offset, and applying a mitigation credit for the revegetation of the area of Bush Forever proposed to be cleared, a total of 0.085 ha of the additional land acquired would need to be allocated to offset the 0.17 ha of additional impacts to Bush Forever, not considered within the scope of the NPO.



Figure 2: Land acquisition area

Rehabilitation

The rehabilitation of 5 ha of adjacent bushland in Degraded or Good condition to a Very Good condition state as per Keighery (1994) was accepted as part of the NPO. The details of this rehabilitation will be outlined in a Rehabilitation Plan. An interim rehabilitation strategy has been provided and provisional rehabilitation sites have been identified (Strategen-JBS&G 2020h). The completion criteria for the rehabilitation plan will include weed coverage, plant density and species richness equivalent to areas considered to be in Very Good vegetation condition (Keighery, 1994; Strategen-JBS&G, 2020a) and include the provision of 0.67 ha of *Marianthus paralius* habitat. Monitoring will continue for a minimum 5 years, or until completion criteria are achieved (Strategen-JBS&G, 2020a). This rehabilitation plan focuses on the areas to the north and east of the application area to improve the quality of the vegetation that will provide ecological linkage between remnant vegetation to the north and south of the application area. The rehabilitation of suitable *Marianthus paralius* habitat conditioned through this clearing permit (CPS 8947/1) may intersect with areas of rehabilitation required through the NPO.

Other minimisation methods

The NPO also outlines other mitigation requirements, namely a Construction Environmental Management Plan (CEMP), to ensure that potential indirect impacts to adjacent vegetation outside of the application area is controlled and managed. This will include:

- the clear demarcation of clearing extent prior to construction to ensure there is no unauthorised access into areas of BF 325 outside the Proposal area from construction personnel or vehicles;

- dust management;
- staged clearing; and
- vehicle hygiene (Strategen-JBS&G, 2020a).

Appendix A – Additional information provided by applicant

Summary of comments

On 22 July 2020, Strategen-JBS&G provided DWER with a rehabilitation plan for the 0.17 ha of Bush Forever Site 325 which was to be impacted under the proposed clearing (CPS 8947/1), but hadn't been considered as part of the NPO.

On 24 September 2020, Strategen-JBS&G provided DWER with a draft rehabilitation proposal to mitigate the impacts to *Marianthus paralius* habitat.

Consideration of comment

The applicant has committed to rehabilitating the additional impacts to the 0.17 ha of Bush Forever vegetation *in situ* and will do in accordance with the revegetation plan provided. As outlined above, 0.085 ha of the additional 3.3 ha of land acquired at the Carabooda offset site has been allocated as an offset to counterbalance the impacts to Bush Forever vegetation not considered as part of the NPO.

The applicant has committed to the rehabilitation of 4.67 ha of habitat suitable for *Marianthus paralius* which is outlined in Section 3.1 and reflected in the Permit conditions.

Appendix B – Details of public submissions

Summary of comments	Principle	Consideration of comment
Clearing under this application (2.89 ha) should be assessed in broader context of total development (30 ha), particularly in context no Environmental Assessment was required for the terrestrial portion of the development.	a, b, c, e, f, g, h	Application was referred to the EPA who determined the terrestrial component of the development could be assessed and impacts mitigated through other processes, mainly the Negotiated Planning Outcome (NPO). The NPO determined an appropriate offset for the proposed impacts in accordance with State Planning Policy 2.8 and required 26 ha of land acquisition and 5 ha of rehabilitation and revegetation. Addressed in section 3.3.1.
Applicants Supporting documentation at page 42, refers to an assessment against each the Clearing Principles, but then fails to provide the necessary evidence to support such statements of supposed fact.	a, b, c, d, e, f, g, h, i,	DWER assessing officers have completed their own assessment against the clearing principles set out in Schedule 5 of the EP Act.
The large number of Quandong trees are a direct link to Aboriginal ancestors who lived their traditional customs and thrived in the area	a, planning and other relevant matters	Quandong (<i>Santalum acuminatum</i>) grows in Coastal dunes, gravelly plains, granitic outcrops, creek beds (WAH1998-). This species is not conservation significant according to any state or commonwealth legislation. The wider development area has been subject to five Aboriginal heritage surveys (between 1970 and 2015), which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area. <i>Santalum acuminatum</i> is not classified as 'Threatened' under the BC Act (St) or the EPBC Act (Cth), or Priority by DBCA.
Impacts to four Priority Ecological Communities (PEC)	a	Addressed in section 3.2.1. This was identified as one of the key impacts in the NPO; the offset site and rehabilitation was determined to be suitable in offsetting these impacts. This NPO was endorsed by DBCA, DPLH and the EPA.
Local area contains high level of Biodiversity	a	Addressed in section 3.2.1. The assessment has assumed that a high biodiversity (including fauna and fungi) exists in the application area; however the acquisition of an offset site of high conservation value was determined to mitigate the impacts of the proposed clearing, as endorsed by DBCA, DPLH and the EPA.
The native plants are thriving, including a small grove of mature tuart trees	a	In accordance with the Approved Conservation advice, the patch does not meet requirements to be considered TEC under the EPBC Act, however, does meet the criteria of a Priority 3 Priority Ecological Community. Addressed in section 3.2.1. Clearing of 0.08 ha of vegetation representative of P3 PEC is not considered to be significant.
Ocean Reef bushland and remaining Bush Forever 325 is part of a regionally significant fragmented bushland/wetland linkage	a, e, h	Impacts to ecological linkage were discussed in section 3.2.3 and were considered as part of the 5 ha rehabilitation of Bush Forever vegetation portion of the NPO offset and reflected in the conditions imposed on this clearing permit.

Clearing for road to Resolution Way will remove linkage of continuous vegetation on the coastal side of Ocean Reef Road. Vegetation buffer should always exist between Ocean Reef Road and marine shore and should be standard state planning policy.

a, h

Impacts to ecological linkage were discussed in section 3.2.3. Impacts were considered as part of the 5 ha rehabilitation of Bush Forever vegetation portion of the NPO offset and reflected in the conditions imposed on this clearing permit.

DWER can only assess applications according to the current state legislation and policy.

Impacts to linkage were recognised and minimised as far as practicable through the retention of a north-south linkage of remnant vegetation between Ocean Reef Road and the Proposal area (with the exception of entry roads) (Strategen-JBS&G, 2020b). Conditions were placed on the permit to include the installation of conservation fencing the preparation of a fauna management plan to reduce the risk of vehicle strike on fauna.

Adjacent area contains large number of macroinvertebrates

a, b

Databases were searched for conservation significant fauna with records in the local area and this was compared the habitat within the application area to determined suitability. The vegetation within the application area was not considered significant for known conservation significant invertebrate species. Those contained within the area are known to be common with widespread distribution and abundance.

Red-tailed black cockatoos present in the area as their habitats is decreased elsewhere.

a, b

Vegetation within the application area is not considered to be significant for this species.

Foraging habitat for Carnaby's black cockatoo i.e. *Banksia sessilis*

a, b,

Addressed in section 3.2.2. A total of 0.28 ha of vegetation mapped as communities in which *B. sessilis* was recorded occurs within the proposed clearing area; all of which had a low (<10 per cent) cover of this species, and is therefore not a significant foraging resource.

The coastal vegetation contains fourteen species of reptiles

Databases were searched for conservation significant fauna with records in the local area and this was compared the habitat within the application area to determined suitability. The vegetation within the application area was not considered significant for conservation significant reptile species. Those contained within the area are known to be common with widespread distribution and abundance.

The white winged fairy wren can be found in the low coastal bushland along with abundant splendid wrens.

a, b

Neither species is listed as conservation significant under the BC Act (St), EPBC Act (Cth) or listed as Priority by DBCA. The White winged Fairy Wren (*Malurus leucopterus*) has been identified as locally significant in the Perth Metropolitan Region (Government of Western Australia, 2000), however, it was determined that the proposed impacts would not significantly impact the conservation of the species. Conditions will be placed on the permit to allow for directional clearing and the provision of a fauna management plan to minimise ecological linkage disruption.

Habitat for Graceful Sunmoth (P4) i.e. vegetation including <i>Lomandra maritima</i>	a, b,	Addressed in section 3.2.2. Advice sought from DBCA and based on the confirmed presence of individuals outside of the development envelope and the wide distribution of suitable habitat the proposed clearing is not likely to have a significant impact on this overall viability of this population.
Habitat for Quenda/Southern Brown Bandicoot (<i>Isodon obesulus</i>) (P4). This species is culturally important to the Nyoongar Culture and Heritage in the area.	a, b	Addressed in section 3.2.2. Quenda have been recorded in similar vegetation communities adjacent to the development area and clearing is unlikely to cause significant impacts. DWER have conditioned the permit for the provision of a fauna management plan to be implemented to reduce the risk of vehicle strike on these animals from roadways.
Habitat for Black Striped Snake (<i>Neelaps calonotos</i>) (P3)	a, b	Vegetation within the application area was determined as not significant for this species. Associated with <i>Banksia/Eucalyptus</i> woodlands and sandy areas and no known recordings on the coastal foredunes. The vegetation and habitat from the 26 ha land acquisition of the NPO is suitable for this species.
Bushland including dense groves of quandong (<i>Santalum acuminatum</i>) which have Aboriginal significance as a food and medicine	a, b	The wider development area has been subject to five Aboriginal heritage surveys (between 1970 and 2015), which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area.
The supporting documentation makes no mention of what would be put in place in the way of tunnels or bridges across the proposed access points within the defined ecological corridors.	b	DWER has conditioned the permit for the permit holder to supply and implement a Fauna Management Plan as part of the clearing and development. The Fauna Management Plan will require the development of strategies to reduce vehicle speed and increase driver awareness to minimise vehicle strikes.
Initial access and haulage roads will permanently destroy the coastline and its ancient geo-heritage; Mankind isn't capable of returning these or the local habitat for fauna to its current magnificent array	b	Databases were searched for conservation significant fauna with records in the local area and this was compared the habitat within the application area to determined suitability. The vegetation and landscapes within the application area was not considered significant for conservation significant fauna species with known records in the local area. Those species contained within the area are known to be common with widespread distribution and abundance.
Local sea lion that we have been sighting for over 20 years that recently appeared with 2 smaller sea lions this year that moves between the beach north of the marina and Burns Beach.	b	Not within the Departments scope of assessment as per the clearing principles of the EP Act. The EPA assessed the marine component of the proposed development.
Bob tail lizards and dugites are common reptiles found throughout the headland bush forever reserve.	a, b	Neither species is listed as conservation significant under the BC Act (St), EPBC Act (Cth) or listed as Priority by DBCA. Species is considered common and therefore the vegetation proposed to clear is not considered significant. Conditions will be placed on the permit to allow for directional clearing and the provision of a fauna management plan.

NPO Offset is not like for like.	a, b, c, e, h,	Addressed in section 3.3.1 and the offset area contains similarities in floristic community types, however is not “like for like”; it was determined to be as similar as practicable and in accordance with the State’s <i>Environmental Offsets Policy</i> (2011).
Mattiske survey didn’t record several locally important flora including Yanchep Rose (<i>Diplolaena angustifolia</i>), Coastal Hop Bush (<i>Dodonaea aptera</i>), Native Grape (<i>Nitraria billardierei</i>), <i>Leptomeria preissiana</i> , <i>Samphire</i> spp.	a, c	None of the species mentioned are classified as ‘Threatened’ under the BC Act (St) or the EPBC Act (Cth), or as Priority by DBCA. A range of flora and vegetation surveys conducted from 2000 to 2019, as mentioned in the supporting documentation for CPS 8947/1, were considered as part of the Negotiated Planning Outcome.
Nearly 30 ha of habitat for <i>Marianthus paralius</i> removed	c	During the review of the vegetation mapping by Strategen-JBS&G (2020b), 2.34 ha of habitat determined as suitable for <i>M. paralius</i> was identified within the clearing footprint for this application. The applicant has committed to 4.67 ha rehabilitation of habitat suitable for <i>M. paralius</i> as an offset for this permit and the previous permits granted for Ocean Reef Marina development (CPS 8787/1 and CPS 8788/1).
Clearing of remnant vegetation within local area and clearing of underrepresented mapped vegetation complexes and clearing of vegetation that is significant as a remnant of native vegetation.	e	Addressed in section 3.2.3. Although the vegetation extent within the local area and vegetation complex is above the EPA’s recommended 10 per cent threshold for the Perth Metropolitan Region, it was determined that the application area is located in an area of vegetation that is considered a significant remnant. This was considered in the NPO.
Excising of 26 ha of Bush Forever without offset.	e, h	Addressed in section 3.3.1. A Metropolitan Region Scheme (MRS) amendment (1270/41) to facilitate this development was initiated in 2014 and gazetted in November 2019 (WAPC, 2016). This amendment included the excision of 26.26 ha of Bush Forever Site 325, of which 16.79 ha remains vegetated. One of the outcomes of this amendment was the requirement of a Negotiated Planning Outcome (NPO). Part of the NPO included 26 ha of land acquisition and 5 ha of rehabilitation as an offset.
Clearing of 0.17 ha of Bush Forever Site 325	h	The 0.17 ha of BF will be rehabilitated in-situ once the final batter levels have been determined through future detailed design (Strategen-JBS&G, 2020b). DWER has also allocated 0.085 ha of the Carabooda offset site as mitigation for the clearing to BF 325 that was not assessed as part of the NPO.
The seasonal hypersaline wetland still exists on the cliffs of the application area.	f	Addressed in section 3.2.4. According to the supporting documentation for the clearing permit, vegetation and flora surveys (to undertake reconnaissance, detailed and verification work) conducted between 2000 and 2019 have not identified any watercourses or wetlands within the Ocean Reef Marina development footprint. However, <i>Frankenia pauciflora</i> is present within the H1 vegetation type. This species is the main component of the Floristic Community Type (FCT) ‘ <i>Frankenia pauciflora</i> Low Shrubland (highly saline seasonal wetland)’. This FCT was

		mapped within Bush Forever Site 325 description from 2000. Given the habitat requirements for this vegetation type, it is likely the species is present in the vegetated areas of the remaining Bush Forever 325 site, and therefore, the impacts of the proposed clearing will not significantly impact on this seasonal wetland associated FCT.
Impacts of clearing on loose sand and potential degradation of exposed soils through wind and rainfall	g	Addressed in section 3.2.4 and conditions on the permit for staged clearing will mitigate the impacts of land degradation.
Weed recruitment into disturbed bare ground post clearing will decrease the condition of the surrounding bushland	h	Conditions on the permit for dieback and weed control will mitigate the impacts and invasion of weed recruitment.
Who will enforce the conditions of the CMP and what penalties will apply?	g, Other	The clearing will be guided by a Construction Environmental Management Plan (CEMP) as conditioned on the Development Approvals from the City of Joondalup (DAP20/01755 & DAP20/01756).
2020 design of the Ocean Reef Marina (OCERM) Project is not for a marina but for a township or canal development and this is not supported by community	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
With the large amount of surrounding vegetation removed the remaining vegetation will be less resilient to the climate change impacts	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
The application area is part of a significant remnant of aboriginal culture which has been largely destroyed by urban development.	Planning and other matters	Addressed in section 3.3. The wider development area has been subject to five Aboriginal heritage surveys (between 1970 and 2015), which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area.
It has come to the attention of the Nyoongar people of the area that there has never been full and proper Culturally appropriate processes/consultation for having our voices heard about our concerns about the development of the ocean and the foreshore of Ocean Reef.	Other relevant matters	Addressed in section 3.3. The wider development area has been subject to five Aboriginal heritage surveys (between 1970 and 2015), which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area. The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the scope of the assessment under Part V of the EP Act.
Although the Carabooda Offset site was purchased, with high values, one could assume that the site would not be able to be developed, thus the offset is not an addition to the conservation estate.	a, b, c, e, f, g, h	Addressed in section 3.3.1. The land acquisition portion of the NPO was assessed and agreed upon by DBCA, DPLH, EPA and the applicant agreed to the purchase of the 26 ha offset site. It will be vested for conservation purposes and meets the site selection criteria as outlined by the State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region (SPP 2.8) (WAPC, 2010; Strategen-

JBS&G, 2020a). Land acquisition is a valid means of offsetting environmental impacts, as outlined in the Environmental Offsets Guidelines (2014).

Development to benefit those with high disposable income and own marine crafts	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Real estate developer greed has been placed ahead of the environment.	Other	Addressed in section 3.3.1. The NPO was determined to counterbalance the impacts of the proposed development on environmental values.
Disregard for the efforts volunteers have put into the area	Other	The efforts of volunteers is not directly addressed in the 10 clearing principles. The condition of the vegetation may be higher due to these efforts leading to a higher environmental value, and higher value of the offset provided.
Project should be assessed in the context of COVID-19 and the dramatic impacts to economic sectors of the state i.e. decreased numbers of immigration and tourism.	Other	The projected has been highlighted as an important stimulus to the economy in the context of COVID-19. Assessing the economic viability of the project is not within the Departments scope of assessment as per the clearing principles of the EP Act.
Coastal areas cleared for housing development and remaining unbuilt e.g. north of Burns Beach also become locations for antisocial trail bike riding.	Other	Not within the Departments scope the assessment of the clearing permit application CPS 8947/1.
There is no provision for any more boat ramps and these are in high demand	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
How long will the coastal paths be closed?	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
A huge amount of limestone and other material will be required creating a traffic hazard	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Statistics used to calculate the need for this amount of boat pens and more housing are outdated	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Economic and real estate forecasts predict an increasing demand for low cost rental and social housing which this Proposal does not satisfy.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
The housing development of over 1,000 homes and apartments have been a later addition to facilitate the wider proposal.	Other	Not within the Departments scope of this assessment as per the clearing principles of the EP Act.
Commonwealth Minister for the Environment determined the proposal to be not a controlled action	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.

Lack of available information to the public regarding the development	Other	As per the legislative requirements, DWER has published all the available information it has received in support of the application (CPS 8947/1) on its website for public viewing and comments.
Public survey of coastal path users indicated 100% of participants were unaware of scale and extent of the clearing of the OCERM Project	Other	As per the legislative requirements, DWER has published all the available information it has received in support of the application (CPS 8947/1) on its website for public viewing and comments
Declining demand for boat storage at Hillary's should sound alarm bells for any development plans for further boat facilities.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Future coastal erosion of local beaches. Cliffs are providing an effective buffer against high tides, storms and tsunami-like inundations from the encroaching waters of the Indian Ocean. Ocean Reef is not immune to the effects of intensified coastal erosion resulting from storm damage and sea level rise.	Other	The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act. The impacts of erosion associated with the proposed clearing have been addressed in Section 3.2.4.
The ancient traditional information that local Aboriginal Elders were providing was derived from a cumulative body of knowledge based on thousands of years of empirical observation, flooding experiences and flood narratives handed down over the generations.	Other	Land degradation and potential risks of flooding addressed in section 3.2.4. The Department utilised all readily available information sources in assessing the impacts of the clearing. The assessment also considered potential impacts on Aboriginal heritage values. The wider development area has been subject to five Aboriginal heritage surveys (between 1970 and 2015), which did not identify any registered sites within the application area (Strategen-JBS&G, 2020b); the nearest registered site located 840 metres south of the application area.
Ocean reef wastewater outfall capacity and discharging of contaminants and nutrients into A-Class Marine Park.	Other	The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.
Will the outfall pipe from the Water Treatment Plan be lengthened? Will it be compromised due to the sea wall?		
Natural flushing capacity of the marina	Other	The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.
The proposed marina risks jeopardising an important ocean wildlife, reef communities and coastal fauna habitat. The reef	Other	The marine component of the proposed development was referred and assessed by the EPA and is therefore outside

systems are an ancient place for food sources for aboriginal people

the clearing principles and scope of assessment under Part V of the EP Act.

Coastal Processes and Wrack Management Plan (CPWMP) required by condition 7-2 of Ministerial Statement 1107 has not yet been submitted to DWER

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.

The CPWMP will be submitted to DWER and assessed by the EPA, as per condition 7-2 of ministerial statement 1107.

The ongoing infrastructure maintenance costs for this unnecessarily extravagant Marina and secret coastal residential development will be a burden on society that residents cannot afford.

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.

This clearing permit allows the construction of sea walls and facilitates the destruction of approximately 1.2 km of this regionally significant geological feature. A cliff where an Osprey pair that have been studied by local school students for the last ten years will be destroyed.

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.

Pandion cristatus or eastern osprey were determined as potentially present within the applied clearing area, however given the large range of this species, the habitat was not considered to be significant.

Light pollution will impact invertebrates, birds, mammals and plants of the sea.

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the clearing principles and scope of assessment under Part V of the EP Act.

That the term "offset" has no valid applicability for any clearing application for project's like OCERM that promote a total ecological break

Other

The offset was developed in accordance with State Planning Policy (SPP) 2.8. The relevant criteria outlined in SPP 2.8, with regard to the impacts to Bush Forever Site 325, include:

- provide better condition vegetation/less disturbance compared with the portion of BF 325 impacted
 - contains vegetation communities as similar as possible to the impacted site
 - have an improved area to perimeter ratio than the impacted site
 - contain conservation significant species and communities of similar value and priority for protection
 - are contiguous with an existing conservation area
 - enhance biological corridors or ecological linkages between conservation areas
 - occur within the same bioregion.
- The NPO has taken into account the disruption of ecological linkage within the landscape.

Changes in the quality of adjacent marine waters caused by the outflow of marina water.

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the scope of the assessment under Part V of the EP Act.

Changes in water quality associated with maintenance dredging.

Other

The marine component of the proposed development was referred and assessed by the EPA and is therefore outside the scope of the assessment under Part V of the EP Act.

Community considerations and the sense of place that will be lost with the removal of the vegetation proposed under this application.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
It is the practice of local governments to spray urban grey and green infrastructure with a cocktail of toxic pesticides.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Use of the proposed Ocean Reef Marina development is highly vehicle dependent and contrary to the State Government's strategy of urban development near public transport nodes.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Any development proposal should routinely consider the visual landscape, its social values, and especially a coastal landscape.	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act.
Construction Environment Management Plan is made available for Public Comment for a period of at least 7 days, at least 14 days before clearing commences	Other	Not within the Departments scope of assessment as per the clearing principles of the EP Act. All the relevant documentation is available on the departments website, as per section 51E(5) of the EP Act. The CEMP will be submitted to the City of Joondalup for approval as per the requirements of the NPO and the City's DA conditions.
DWER fails to effectively support the EPA in conducting environmental impact assessments and developing policies to protect the environment thereby preventing sound, robust and transparent advice to the Minister for Environment.	Other	The Native Vegetation Regulation Branch of DWER conducts assessment of clearing permit applications in accordance with the clearing principles set out under Schedule 5 of the EP Act. The EPA determined that the MRS amendment and terrestrial component of the development did not require formal assessment and it was considered that the impacts could be adequately managed through the assessment of the clearing under Part V of the EP Act and Negotiated Planning Outcome (NPO).
Development should occur in the land zoned as 'Urban' and	Planning and other relevant matters	Addressed under section 3.3 Planning and other relevant matters. The Joint Development Assessment Panel (JDAP) recently granted two separate development approvals for the proposed breakwater construction (DAP20/01756) for: <ul style="list-style-type: none"> the portion of works located on land reserved for 'Parks and Recreation' and 'Waterways' under the Metropolitan Region Scheme (MRS); (Western Australian Planning Commission (WAPC)); and the portion of works located on land zoned 'Urban' under the MRS (City of Joondalup).
This clearing permit application, as with CPS 8787 and 8788, lacks consistency in detail, as well as adherence to due and proper	Other	Decisions from CPS 8787/1 and 8788/1 were publicly available on the Departments website, as is every granted permit made by DWER. The decisions made by DWER were

process required by the various public consultation processes that proceeded them. These failings need to be publicly and openly addressed by DWER.

appealed by members of the public and the appeal grounds dismissed by the Minister on 1 July 2020.

Appendix C – 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 D.

1. Site characteristics

Site characteristic	Details
Local context	<p>The proposed clearing area is part of an expansive tract of native vegetation in the local area. The area surrounding the proposed development is part of Bush Forever Site 325, and the majority of the proposed clearing area was part of Bush Forever until the Metropolitan Region Scheme Amendment 1270/41, which excised a 26.26 ha portion of Bush Forever to facilitate the development of Ocean Reef Marina. A total of 0.17 ha of the clearing proposed under this application is still within the Bush Forever 325 site. The proposed clearing area is part of an important ecological linkage of coastal vegetation in the Perth Metropolitan Region. Spatial data indicates the local area (10 km radius of the proposed clearing area) retains approximately 21% of the original native vegetation cover.</p>
Vegetation description	<p>A vegetation survey undertaken by Mattiske Consulting (2013) and reassessed by Strategen-JBS&G in 2019 indicate the vegetation within the proposed clearing area consists of six vegetation communities, including two heathlands, three shrublands and a small area of Tuart Woodland (Mattiske Consulting, 2013; Strategen-JBS&G, 2020b). Approximately 81 per cent of the proposed clearing area is mapped as vegetation community H1, which is described as a low open scrubland to heath of <i>Acacia cyclops</i>, <i>Acacia rostellifera</i>, <i>Spyridium globulosum</i> and <i>Templetonia retusa</i> over <i>Scaevola crassifolia</i>, <i>Olearia axillaris</i>, <i>Myoporum insulare</i> and <i>Rhagodia baccata</i> subsp. <i>dioica</i> over <i>Acanthocarpus preissii</i>, <i>Threlkeldia diffusa</i>, <i>Senecio pinnatifolius</i> and <i>Frankenia pauciflora</i> over <i>Lepidosperma gladiatum</i>, <i>Spinifex longifolius</i>, <i>Sporobolus virginicus</i> and mixed exotics on white sands or light grey sands of fore- and primary dunes with frequent limestone outcropping. The full survey descriptions and mapping are available in Appendix F.</p> <p>This is consistent with the mapped vegetation type for the proposed clearing area: the Quindalup Complex - 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 <i>Melaleuca lanceolata</i> (Rottnest Teatree) - <i>Callitris preissii</i> (Rottnest Island Pine), the closed scrub of <i>Acacia rostellifera</i> (Summer-scented Wattle) and the low closed <i>Agonis flexuosa</i> (Peppermint) forest of Geographe Bay (Hedde <i>et al.</i>, 1980).</p>
Vegetation condition	<p>A vegetation survey undertaken by Mattiske Consulting (2013) and confirmed by Strategen-JBS&G in 2019 indicate the vegetation within the proposed clearing area ranges from completely degraded to excellent condition (Keighery, 1994), with the majority of the proposed clearing area (~83%) in good to very good condition (Mattiske Consulting, 2013), described as:</p> <ul style="list-style-type: none">• 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.

Site characteristic	Details
	The full Keighery condition rating scale is provided in Appendix E. The full survey descriptions and mapping are available in Appendix F.
Soil description	<p>Two soil types are mapped within the proposed clearing area (Schoknecht <i>et al.</i>, 2004):</p> <ul style="list-style-type: none"> • Quindalup South youngest dune Phase (211Qu_Q4): the youngest phase. Irregular dunes with slopes up to 20%. Loose pale brown calcareous sand with no soil profile development. • Quindalup South second dune Phase(211Qu_Q2) The second phase. A complex pattern of dunes with moderate relief. Calcareous sands have organic staining to about 20 cm, passing into pale brown sand; some cementation below 1 m. <p>Due to the close proximity to the coastline, some of the proposed clearing area does not have a mapped soil type. However, based on adjacent soil mapping it is assumed that these areas form part of the Quindalup South youngest dune Phase.</p>
Land degradation risk	<p>The proposed clearing area has the following land degradation risks (van Gool <i>et al.</i> 2005):</p> <ul style="list-style-type: none"> • Low risk of: <ul style="list-style-type: none"> ○ Flooding; ○ Salinity; ○ Subsurface acidification; and ○ Waterlogging; • Moderate risk of: <ul style="list-style-type: none"> ○ Phosphorus export; and ○ Water erosion; and • High to extreme risk of: <ul style="list-style-type: none"> ○ Water repellence; and ○ Wind erosion
Waterbodies	The desktop assessment and aerial imagery indicated that the proposed clearing area does not intersect any mapped watercourses or wetlands. The application area is in close proximity to the coastline, with coastal foredunes proposed to be cleared. However, impacts to the marine component of the Ocean Reef Marina Development are being addressed through a Part IV EPA assessment.
Conservation areas	<p>The majority of the proposed clearing area was previously part of Bush Forever Site 325 until the gazettal of Metropolitan Region Scheme Amendment 1270/41, which rezoned areas to facilitate the development of the Ocean Reef Marina, and included the removal of 26.26 ha of Bush Forever, of which 16.79 ha is native vegetation (WAPC, 2016). The proposed clearing area includes 0.17 ha of vegetation that was not excised under the MRS scheme and is still listed as Bush Forever.</p> <p>Bush Forever Site 325 is approximately 10 kilometres of semi-continuous coastal vegetation from Hillarys to Burns Beach. The northern end of Bush Forever Site 325 is located approximately 380 metres from Bush Forever Site 322, which forms a further 4 kilometres of coastal native vegetation. Although majority of the proposed clearing area is no longer part of the Bush Forever site, the proposed clearing may impact this adjacent conservation area through weed and disease invasion, unauthorised access, accidental clearing, and erosion impacts.</p>
Climate and landform	The landform within the proposed clearing area is typical of the coastal landscape in the local area, with undulating foredunes and steep cliffs adjacent to the coastline in some areas. Elevation ranges from 0 m Australian height Datum (ADH) to 20 m ADH, with a high dune system located within the norther portion of the proposed clearing area.

Site characteristic	Details
	Climate within the Perth Metropolitan Region is characterised by a Mediterranean climate, with hot dry summers and mild wet winters. Wind speeds, an important factor in coastal landscapes, are typically from the southwest or northwest, with high wind speeds associated with winter storms.

2. Flora, fauna and ecosystem analysis

With consideration for the site characteristics set out above, relevant datasets, and biological survey information provided (see Appendix F), the following conservation significant flora and fauna species, and ecological communities were determined to be likely to occur within the application area. There have been a number of flora and vegetation surveys undertaken within the wider development in the previous 20 years, however, the most recent comprehensive survey was undertaken in 2013:

- Flora and Vegetation Assessment – Mattiske Consulting – June 2000;
- Vegetation and Flora Assessment – Bowman Bishaw Gorham – April and May 2002;
- Vegetation Condition, Ecological Community and Flora Search Report – SMEC and Natural Area Management Services – September 2008 and 2009;
- Level 2 Flora and Vegetation Survey – Mattiske Consulting – October 2013; and
- Ground truthing to confirm vegetation community and condition mapping – Strategen-JBS&G – Spring 2019 (Strategen-JBS&G, 2020b); and
- Targeted survey for *Grevillea* sp Ocean Reef (D. Pike Joon 4) within suitable habitat in proposed clearing areas – Strategen-JBS&G – May 2020 (Strategen-JBS&G, 2020b).

As the area has been extensively surveyed for vascular flora, it was determined that although the habitat is suitable for the flora species and communities outlined below, they are not likely to be present within the application area, with the exception of *Conostylis bracteata*, which was recorded within the application area. Two species were not identified in the most recent (2013) flora and vegetation survey's desktop assessment of conservation significant species and subsequently not targeted during the survey. *Stylidium maritimum* (Priority 3) was not recorded within the local area until 2015, and *Lecania turicensis* var. *turicensis* (Priority 2) is a lichenized fungus, which was not within the scope of the flora assessment. Conservation significant flora, fauna and ecological communities that were determined to be unlikely to occur within the application area are not included in the below table.

Species / Community	Ecological	Distance of closest record to application area (kilometres)	Suitable soil type?	Suitable vegetation type?	Are surveys adequate to identify?	Comments
<i>Baeckea</i> sp. Limestone (N. Gibson & M.N. Lyons 1425) (Priority 1)		3.6	Yes	Moderately	Yes	Typically occurs in <i>B. sessilis</i> shrubland
<i>Conostylis bracteata</i> (Priority 3)		Within application area	Yes	Yes	Yes	Within application area, population has not been quantified
<i>Eucalyptus argutifolia</i> (T)		5.9	Yes	Yes	Yes	Sufficient surveys to conclude it is not within the application area
<i>Grevillea</i> sp. Ocean Reef (D. Pike Joon 4) (Priority 1)		0.4	Yes	Yes	Yes	Recorded within close proximity, however a targeted survey did not identify any plants within the application area

<i>Hibbertia leptotheca</i> (Priority 3)	1.9	Yes	Yes	Yes	Recorded within close proximity to the application area previously (see Appendix F)
<i>Lecania turicensis</i> var. <i>turicensis</i> (Priority 2)	3	Yes	Unknown	No	Fungi survey has not been undertaken in the application area
<i>Leucopogon maritimus</i> (Priority 1)	2.2	Yes	Yes	Yes	Habitat is suitable, however record in local area is historic (1966)
<i>Marianthus paralius</i> (T)	1.9	Yes	Yes	Yes	Habitat is suitable
<i>Pimelea calcicola</i> (Priority 3)	3	Yes	Yes	Yes	Most of the records in the local area are historic
<i>Sarcozona bicarinata</i> (Priority 3)	1.9	Yes	Yes	Yes	Sufficient survey effort to determine it is not within the application area
<i>Stylidium maritimum</i> (Priority 3)	8.7	Yes	Yes	No	Not identified in previous survey's desktop assessment

Ecological Communities

Acacia shrublands on taller dunes (SCP 29b) (Priority 3)	12.2	Yes	Yes	Yes,	0.26 ha proposed to be cleared
<i>Callitris preissii</i> (or <i>Melaleuca lanceolata</i>) forests and woodlands, Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. (1994)) (Vulnerable)	5.1	Yes	No	Yes	None within application area
Coastal shrublands over shallow sands, southern Swan Coastal Plain (SCP29a) (Priority 3)	71.5	Yes		Yes	2.5 ha proposed to be cleared
Northern Spearwood shrublands and woodlands (SCP 24) (Priority 3)	5.4	Yes	Yes	Yes	0.05 ha proposed to be cleared
Tuart (<i>Eucalyptus gomphocephala</i>) woodlands and forests of the Swan Coastal Plain (Priority 3)	2.3	Yes	Yes	Yes	0.08 ha proposed to be cleared

Species	Distance of closest record to application area (kilometres)	Significant habitat features	Are surveys adequate to identify? (Y, N, N/A)	Comments
Fauna				
Carnaby's Cockatoo (<i>Calyptrorhynchus latirostris</i>) (Endangered)	Within	<i>Banksia sessilis</i>	Yes	Vegetation communities with low level of <i>B. sessilis</i> total 0.28 ha. Based on <10% cover of <i>B. sessilis</i> within these communities, a maximum of 0.0028 ha (280m ²) of foraging species will be impacted.
Crested tern (<i>Thalasseus bergii</i>) (Migratory)	Within	Coastal location	No	Marine-estuarine species. Species has been recorded in close proximity, however, the application area is not likely to provide significant habitat. Adjacent shoreline/beach habitat will not be impacted by proposed clearing.
Black striped snake (<i>Neelaps calontos</i>) (Priority 3)	2.1	<i>Banksia/Eucalyptus</i> woodland. Sandy areas/coastal dunes	Yes	Species was considered as part of the NPO and 26 ha of suitable habitat was acquired.
Fleshy-footed Shearwater (<i>Ardenna carneipes</i>) (Vulnerable)	8.1	Coastal location	No	Marine - pelagic species that breeds on offshore islands. Species has been recorded in close proximity, however, the application area does not provide significant habitat.
Fork-tailed Swift (<i>Apus pacificus</i>) (Migratory)	1.8	Coastal location	No	Migratory, almost exclusively aerial species. Non-breeding visitor to all states of Australia. May intermittently overfly the area without utilising any particular habitat.
Graceful Sun Moth (<i>Synemon gratiosa</i>) Priority 4	0.3	<i>Lomandra maritima</i>	No	This section of Ocean Reef Foreshore has records of the species and it is likely to occur in the application area
Eastern Osprey (<i>Pandion cristatus</i>) (Migratory)	6.0	Coastal location	No	Fish-eating raptor that would utilise the adjacent marine habitat for feeding. Roost and nests in large trees not present in the application area. This species may be a transient - moving between foraging and or roosting areas.
Peregrine Falcon (<i>Falco peregrinus</i>) Other specially protected fauna	4.8	Coastal location	No	This species is widespread in Australia, but requires specific nesting sites. It does not build a nest and requires cliffs, rocky outcrops, or large tree hollows not present in the application area. May overfly the application area without utilising any particular habitat.
Greater Sand Plover (<i>Charadrius leschenaultii</i>) (Vulnerable)	5.06	Coastal location	No	Migratory shoreline-estuarine species. Species has been recorded in close proximity, however, the application area is not likely to provide significant habitat. Adjacent shoreline/beach

Species	Distance of closest record to application area (kilometres)	Significant habitat features	Are surveys adequate to identify? (Y, N, N/A)	Comments
Curlw Sandpiper (<i>Calidris ferruginea</i>) Critically Endangered	2.25	Coastal Location	No	habitat will not be impacted by proposed clearing. Migratory shoreline-estuarine species. Species has been recorded in close proximity, however, the application area is not likely to provide significant habitat. Adjacent shoreline/beach habitat will not be impacted by proposed clearing.
Quenda (<i>Isoodon fusciventer</i>) Priority 4	0.09	Dense vegetation	No	This section of Ocean Reef Foreshore has records of the species and it is likely to occur in the application area

3. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	% remaining	Current extent in all DBCA managed land (ha)	% current extent in all DBCA managed land (proportion of pre-European extent)
IBRA bioregion					
Swan Coastal Plain	1,501,209.19	587,889.09	39.2	195,834.88	33.3
Vegetation complex					
Quindalup Complex	54,573.87	33,011.64	60.49	4,917.93	9.01
Local Area					
City of Joondalup	9,802.67	1,158.34	11.82	-	-
Quindalup Complex within City of Joondalup	2,444.69	319.00	13.05	-	-
10 kilometre radius	17,547.21	3,761.00	21.43	-	-

Appendix D – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u> The proposed clearing area contains locally and regionally significant flora, fauna, and ecological communities.</p>	At variance	Yes Refer to Section 3.2.1.
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u> The proposed clearing area likely contains a high level of fauna biodiversity and acts as part of an important ecological linkage in the local area. The application area also contains suitable habitat for conservation significant fauna.</p>	At variance	Yes Refer to Section 3.2.2.
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The proposed clearing area has habitat consistent with suitable habitat for flora species listed under the BC Act.</p>	May be at variance	Yes Refer to Section 3.2.1.
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.”</i></p> <p><u>Assessment:</u> The proposed clearing area does not contain species assemblages consistent with communities listed as threatened under the BC Act 2016.</p>	Not likely to be at variance	No
Environmental values: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The extent of native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia, however, is above the EPA modified threshold. Vegetation in the proposed clearing area is considered to be part of a significant ecological linkage in the local area.</p>	At variance	Yes Refer to Section 3.2.3.
<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 distance to the nearest conservation area, and the proposed clearing within a conservation area, the proposed clearing will have direct and indirect impacts on the environmental values of the adjacent conservation area.</p>	At variance	Yes Refer to Section 3.2.3
Environmental values: 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>	May be at variance	Yes

Assessment against the Clearing Principles**Variance level****Is further consideration required?**

Assessment: Some aspects of the vegetation within the application area are consistent with a Highly Seasonal Saline Wetland (FTC16). There are no mapped watercourses or wetlands in close proximity to the proposed clearing area and the proposed clearing is not likely to impact on- or off-site hydrology and water quality.

Refer to Section 3.2.4

Principle (g): *“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”*

At variance

Yes

Assessment: The mapped soils highly susceptible to wind erosion and water repellence. Noting the extent and location of the proposed clearing, the proposed clearing is likely to have an appreciable impact on land degradation unless managed appropriately.

Refer to Section 3.2.4

Principle (i): *“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”*

Not likely to be at variance

No

Assessment: Given the distance to the nearest watercourse or wetland and the location of the proposed clearing area, the proposed clearing is unlikely to impact surface or ground water quality.

Principle (j): *“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”*

Not likely to be at variance

No

Assessment: The mapped soils and location of the proposed clearing area indicate that the proposed clearing is not likely to contribute to increased incidence or intensity of flooding, or contribute to waterlogging.

Appendix E – 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.

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 F – Biological survey information excerpts / photographs of the vegetation

1. Flora and Vegetation – Matiske Consulting (2013)

The majority of the supplied data used in the assessment of the environmental values was from the level 2 flora and vegetation survey undertaken by Matiske Consulting in 2013.

1.1 Flora

A total of 137 vascular plant taxa which are representative of 105 plant genera and 43 plant families were recorded within the proposed Ocean Reef Marina survey area. The majority of the taxa recorded were representative of the Poaceae (20 taxa), Fabaceae (14 taxa), Asteraceae (12 taxa) and Myrtaceae (6 taxa) families (Appendix C). Of the 137 plant taxa recorded within the survey area, 49 species were introduced (exotic). The introduced taxa were represented by 16 plant families, the most common of which was Poaceae (13 taxa) and Asteraceae (9 taxa).

Of the 137 plant taxa recorded within the survey area, 91 (66.5%) were perennials, 33 (24%) were annuals and 13 (9.5%) were annual/perennial depending on local conditions.

1.2 Significant Flora

Two Priority Flora species pursuant to subsection (2) of section 23F of the WC Act and as listed by the DPaw (2013a) were recorded within the Proposed Ocean Reef Marina survey area. One species was the Priority 1 *Grevillea* sp. Ocean Reef and the other the Priority 3 *Conostylis bracteata*.

Species	Survey Site	Geographic Location (GDA94_Z50)		Population
		Easting	Northing	
<i>Grevillea</i> sp. Ocean Reef (P1)	Opportunistic site	379828	6485609	40
<i>Grevillea</i> sp. Ocean Reef (P1)	Opportunistic site	379815	6485580	18
<i>Grevillea</i> sp. Ocean Reef (P1)	Opportunistic site	379859	6485571	10
<i>Conostylis bracteata</i> (P3)	7	379471	6486262	300
<i>Conostylis bracteata</i> (P3)	8	379895	6485328	60
<i>Conostylis bracteata</i> (P3)	10	379501	6486201	50
<i>Conostylis bracteata</i> (P3)	12	379557	6486162	25
<i>Conostylis bracteata</i> (P3)	15	379561	6486103	12
<i>Conostylis bracteata</i> (P3)	18	379554	6486005	90
<i>Conostylis bracteata</i> (P3)	20	379488	6485979	12
<i>Conostylis bracteata</i> (P3)	36	379738	6485737	27
<i>Conostylis bracteata</i> (P3)	38	379707	6485630	25
<i>Conostylis bracteata</i> (P3)	41	379985	6485464	50
<i>Conostylis bracteata</i> (P3)	42	379885	6485514	90
<i>Conostylis bracteata</i> (P3)	59	379791	6485021	12
<i>Conostylis bracteata</i> (P3)	61	379999	6485020	50
<i>Conostylis bracteata</i> (P3)	65	379393	6486402	12

Following formal communication with DPaw staff on the 5/12/13, Michael Hislop on behalf of sedge specialist Russell Barrett notes that until formal detailed evaluation and identification occurs at the WAH, it is recommended that *Tetraria* sp. (JC031, 16/10/2013) be treated as a currently unrecognised taxon.

This species was recorded at site 08 within vegetation community H3, a diverse closed heath mapped to the south-east of the survey area.

1.3 Vegetation type

Priority Ecological Communities

An inference based system has thus been applied, whereby floristic aspects of survey quadrats and vegetation communities delineated in the current survey are inferred to resemble key characteristics of FCT's as described by Gibson *et al.* (1994). Whilst results of comparative analysis have been used to support inferences, greater weight has been given to relating the frequency and dominance of key FCT defining species with those species recorded in the current survey.

Heathland sites within SCP 24 are typically characterised by taxa such as *Banksia sessilis*, *Calothamnus quadrifidus*, and *Schoenus grandiflorus*. Sites generally occur on deeper soils on the Cottesloe unit of the Spearwood system (Gibson *et al.* 1994; DPaW 2013f). Aspects of this community are inferred to be represented in the current survey area by vegetation community S2. The S2 community was a unique community within the survey area and predominately comprised dense tall stands of *B. sessilis* and number of other species consistent with that of SCP 24.

SCP 29a is characterised by heaths with no single dominant species. Important shrubs include; *Acanthocarpus preissii*, *Spyridium globulosum*, *Rhagodia baccata* and *Olearia axillaris* and important herbs include; *Crassula colorata*, *Senecio pinnatifolius* and *Austrostipa flavescens*. Generally found on shallow soils over limestone by the coast (Gibson *et al.* 1994; DPaW 2013f). Aspects of this community are inferred to be represented in the survey area by vegetation communities S1 and H1. Both communities predominately occur on shallow sands associated with limestone and comprise analogous dominant species to that of SCP29a. The H1 community comprises a number of admixtures associated with changing species dominance and as such it is likely that aspects of S13 Northern *Olearia axillaris* – *Scaevola crassifolia* shrublands and S14 *Spinifex longifolius* grasslands and low shrublands occur within the broadly inferred SCP 29a community. Subjectively, however, areas of S13 and S14 are very small and non-contiguous making delineating and mapping their occurrence impractical.

SCP 29b is characterised by either *Acacia* shrublands or mixed heaths on larger dunes along the coast. This community has no consistent dominate species but important species include; *Acacia rostellifera*, *Acacia lasiocarpa*, *Melaleuca systema*, *Rhagodia baccata*, *Lepidosperma angustatum* and *Trachymene pilosa* (Gibson *et al.* 1994; DPaW 2013f). Aspects of this community are inferred to be represented in the survey area by vegetation communities S3, S4, S5, H2, H3 and H4. These communities occur on tall consolidated dunes and swales in central and eastern sections of the survey area. Admixtures were a common occurrence within associated communities, particularly S3 – S5. As a result, it is likely that aspects of S11 Northern *Acacia rostellifera* – *Melaleuca systema* occur within the broadly inferred SCP 29b community. Similarly to SCP 29a, delineating and mapping the occurrence of this possible admixture within SCP29b would be impractical.



Figure 3: Inferred Priority Ecological Communities within the application area.

Statistical analysis of quadrat information determination

Shrublands and scrublands:

- S1: Mid closed scrubland of *Acacia rostellifera* and *Melaleuca huegelii* with occasional emergent *Banksia sessilis* var. *cygnorum* over *Spyridium globulosum*, *Rhagodia baccata* subsp. *dioica* and *Hibbertia cuneiformis* over *Acanthocarpus preissii*, *Clematis linearifolia*, *Hardenbergia comptoniana* and mixed exotics on deep grey sands of primary and secondary dunes.
- S2: Tall shrubland of *Banksia sessilis* var. *cygnorum*, *Spyridium globulosum*, *Santalum acuminatum* and *Acacia saligna* with occasional emergent *Eucalyptus todtiana* over *Rhagodia baccata* subsp. *dioica*, *Alyogyne huegelii* and *Trymalium odoratissimum* over *Conostylis bracteata* (P3), *Desmocladius asper*, *Lepidosperma pubisquamum* and mixed exotics on deep grey or brown sands of secondary dune swales.
- S3: Tall shrubland of *Spyridium globulosum*, *Acacia rostellifera*, *Banksia sessilis* var. *cygnorum* and *Santalum acuminatum* over *Phyllanthus calycinus*, *Hibbertia hypericoides* and *Melaleuca systena* over *Clematis*

linearifolia, *Austrostipa flavescens*, *Desmocladus flexuosus* and mixed exotics on light grey or brown sands of secondary dune swales.

S4: Mid to tall scrubland of *Acacia rostellifera*, *Spyridium globulosum*, *Templetonia retusa*, *Melaleuca huegelii* and *Melaleuca cardiophylla* over *Leucopogon parvifolius*, *Thomasia cognata*, *Acanthocarpus preissii*, *Phyllanthus calycinus* and mixed exotics on grey sands of secondary dunes with frequent limestone outcropping.

S5: Tall closed shrubland of *Acacia cochlearis*, *Acacia cyclops*, *Acacia rostellifera*, *Allocasuarina lehmanniana* subsp. *lehmanniana*, *Melaleuca huegelii* and *Templetonia retusa* over *Melaleuca systema*, *Scaevola crassifolia* and mixed exotics on grey sands of secondary dune swales with frequent limestone outcropping.

Heath:

H1: Low open scrubland to heath of *Acacia cyclops*, *Acacia rostellifera*, *Spyridium globulosum* and *Templetonia retusa* over *Scaevola crassifolia*, *Olearia axillaris*, *Myoporum insulare* and *Rhagodia baccata* subsp. *dioica* over *Acanthocarpus preissii*, *Threlkeldia diffusa*, *Senecio pinnatifolius* and *Frankenia pauciflora* over *Lepidosperma gladiatum*, *Spinifex longifolius*, *Sporobolus virginicus* and mixed exotics on white sands or light grey sands of fore- and primary dunes with frequent limestone outcropping.

H2: Open heath of *Melaleuca systema*, *Acanthocarpus preissii*, *Leucopogon insularis* and *Acacia lasiocarpa* var. *lasiocarpa* with emergent *Acacia rostellifera* and *Santalum acuminatum* over *Lomandra maritima*, *Conostylis bracteata* (P3), *Poa drummondii* and mixed exotics on grey sands of secondary dune slopes.

H3: Closed heath of *Acacia lasiocarpa* var. *lasiocarpa*, *Cryptandra mutila*, *Leucopogon insularis* and *Melaleuca systema* over *Comesperma confertum*, *Gompholobium tomentosum* and *Opercularia vaginata* over *Lepidosperma pubisquameum*, *Dianella revoluta* var. *divaricata* and mixed exotics on light grey sands of secondary dune slopes.

H4: Low open scrub to heath of *Acacia rostellifera*, *Spyridium globulosum* and *Acacia saligna* over *Melaleuca systema*, *Acanthocarpus preissii*, *Olearia axillaris*, *Phyllanthus calycinus* and mixed exotics on white to light grey sands of primary and secondary dune crests.

Other:

DS: Degraded dune swale.

FR: Fore-dune rehabilitation.

Miscellaneous

BS: Bare sand

CL: Cleared

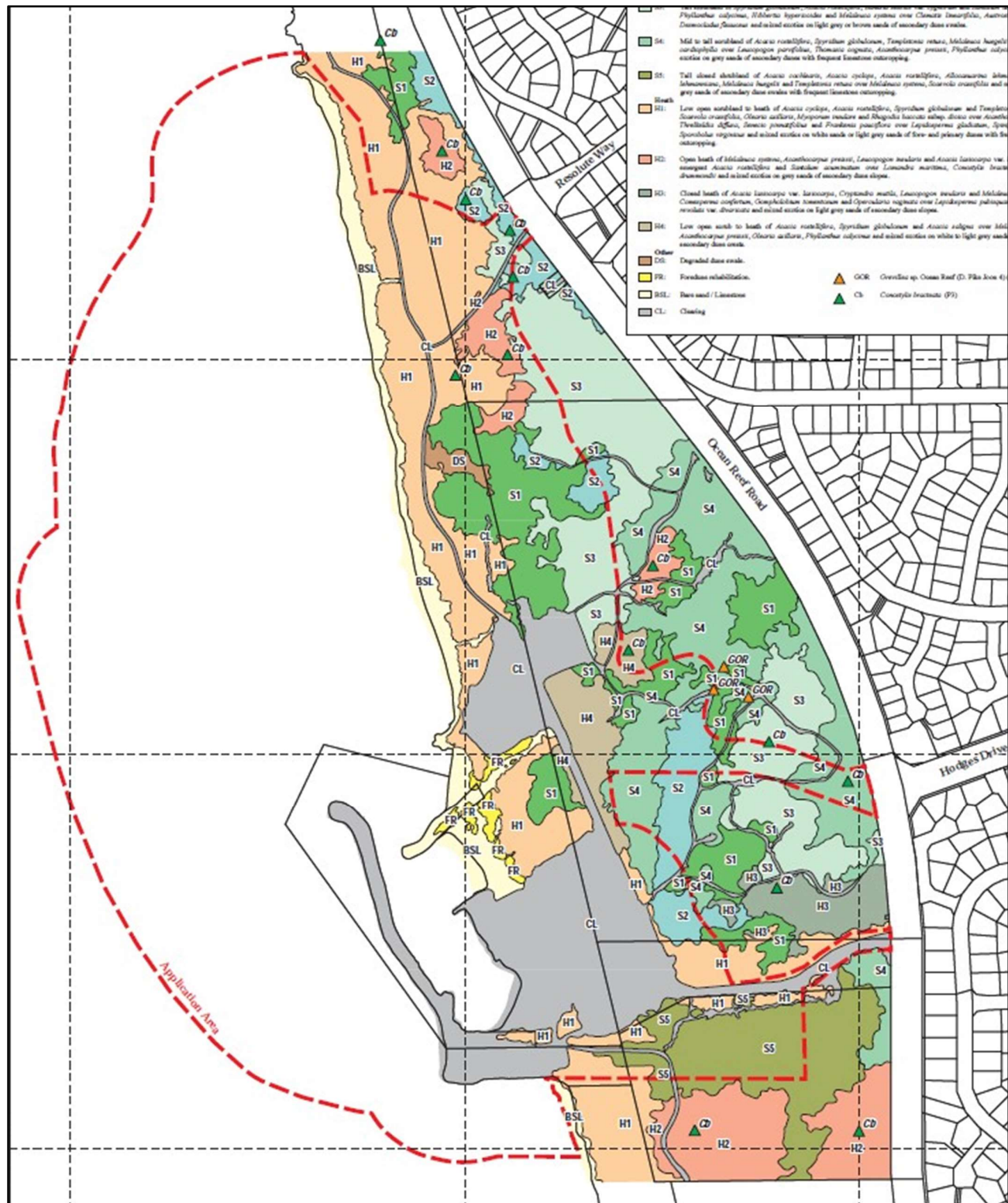


Figure 4: Mapped vegetation types

1.4 Vegetation Condition

Vegetation conditions assigned as per Keighery (1994), outlined in Appendix E.

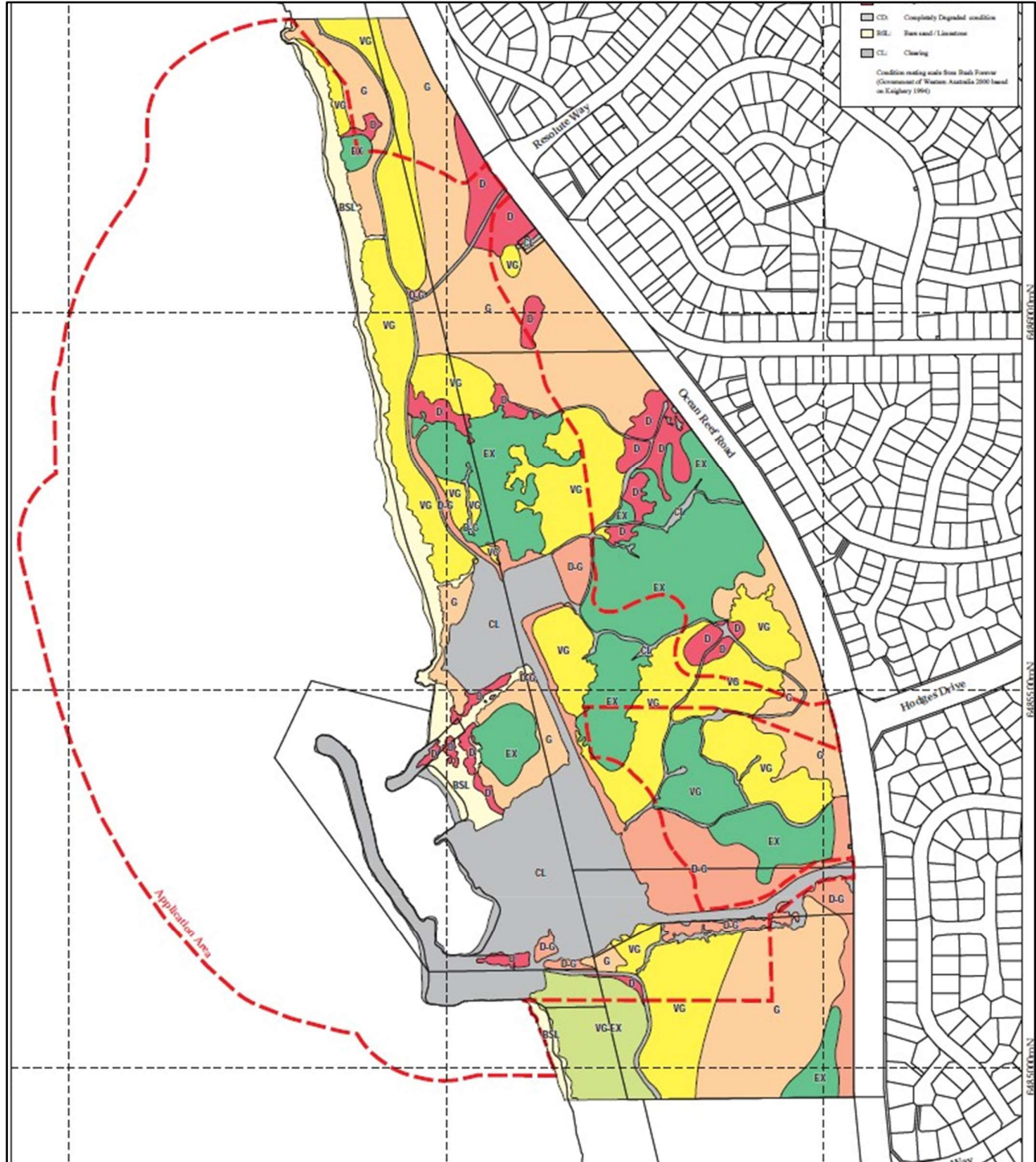


Figure 5: Mapped vegetation condition

2. Other surveys

Flora surveys of the development area include:

- Mattiske Consulting (2000), *Flora and Vegetation Assessment of Lot 1029 and Bushplan Site 325*, City of Joondalup, prepared for The Planning Group (survey conducted in June 2000);
- Bowman Bishaw Gorham (2002), *Vegetation and Flora Assessment Pt Lot 1029, Lots 1032 and 1033 Ocean Reef Road, Ocean Reef*, prepared for City of Joondalup (surveys conducted in April & May 2002);
- Natural Area Management Services (2008), *Vegetation Condition, Ecological Community and Flora Search Report, Ocean Reef Marina*, prepared for the City of Joondalup (surveys conducted 19 & 23 September 2008);
- SMEC Australia Limited & Natural Area Management Services (2009), *Additional Flora Survey, Northern Portion of Proposed ORM Development Site*, prepared for the City of Joondalup (survey conducted September 2009);
- Mattiske Consulting (2013), *Level 2 Flora and Vegetation Survey of the Proposed Ocean Reef Marina Survey Area*, prepared for Strategen on behalf of City of Joondalup (surveys conducted 14 to 17 October 2013);
- Strategen-JBS&G undertook a walkover of the Proposal site in Spring 2019 by to confirm the boundaries and results of the previous vegetation community and condition mapping undertaken. This walkover resulted in minor boundary changes to the vegetation community mapping of VTs S4 and H4. Vegetation composition and condition of the remaining VTs were recorded as consistent with mapping by Mattiske (2013). Based on the site walkover, and conformation of the majority of the mapping it was determined that additional updated detailed surveys were not required. Minor amendments have been made to the Mattiske (2013) mapping which are reflected in Figure 2.5 in the report of Strategen-JBS&G (2020b) and replicated here as Figure 7 where relevant to the proposed clearing footprint; and
- Strategen-JBS&G (2020). An Associate Ecologist undertook a site visit in May 2020 to assess the likelihood of *Grevillea sp. Ocean Reef* occurring in other areas of the Ocean Reef vegetation within and adjacent to the development area. A Memorandum has been prepared outlining the findings of this assessment.

Fauna surveys of the development area include:

- 2008 Level 1 Fauna Assessment – Western Wildlife (2008); and
- 2014 site inspection to confirm black cockatoo habitat – Strategen (2014).

Pertinent details of these assessments including the area of black cockatoo habitat within the development area, the recording of *Hibbertia leptotheca* (which was subsequently not recorded in later surveys), and the updated vegetation mapping are provided below.

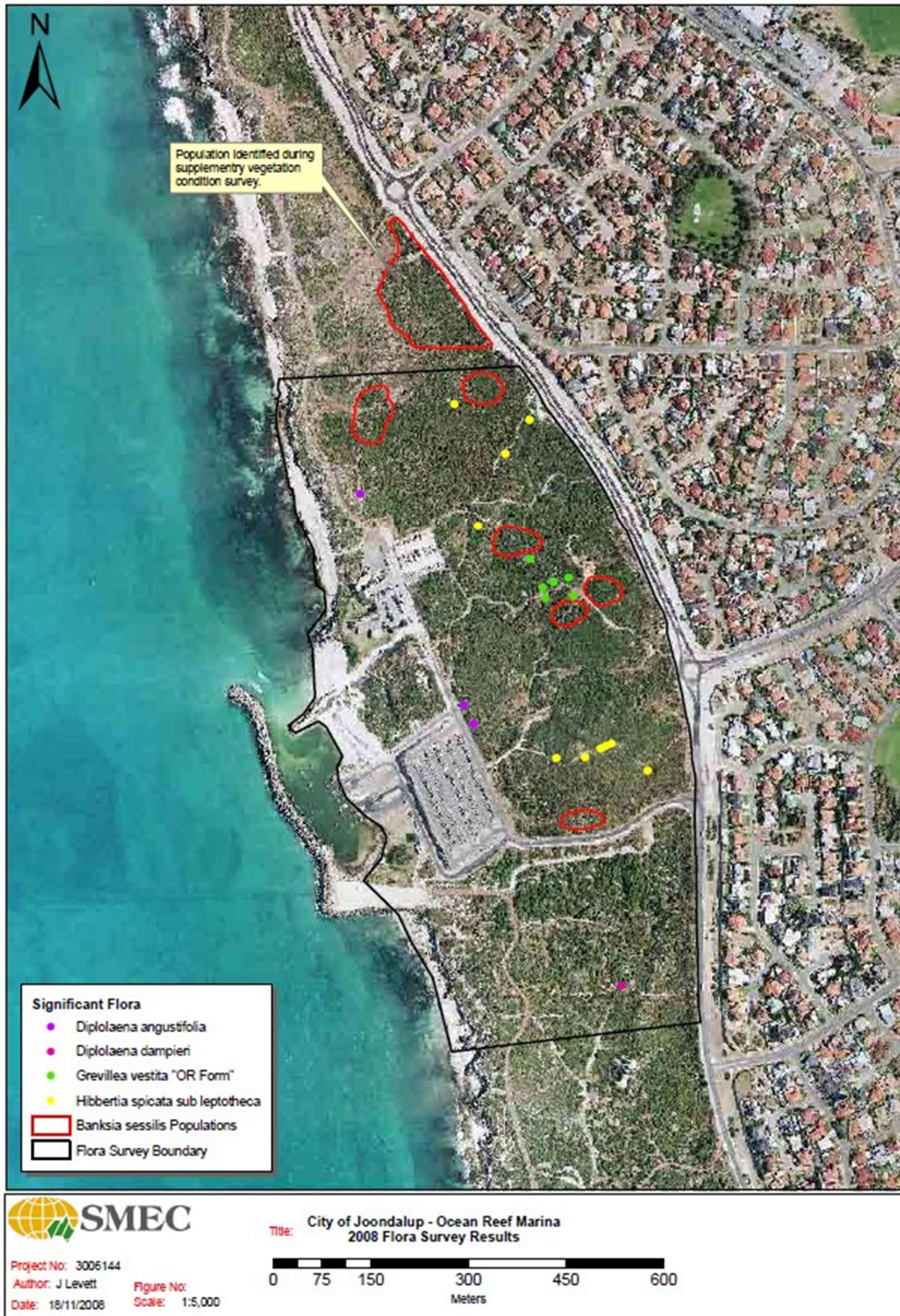


Figure 6: Black Cockatoo foraging and conservation significant flora species (Strategen 2014)



Figure 7: 2019 vegetation type mapping (Strategen-JBS&G, 2020b)

Appendix G – Databases and References

GIS datasets

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

- Aboriginal Heritage Places (DPLH-001)
- Black Cockatoo Breeding Sites – Buffered (DBCA-063)
- Cadastre Address (LGATE-002)
- Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region (DBCA-057)
- 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)
- Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)
- Groundwater Salinity Statewide (DWER-026)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Regional Parks (DBCA-026)
- Regional Scheme – Special Areas (DPLH-022)
- Soil and Landscape Mapping – Best Available
- Soil and Landscape Quality – Wind Erosion Risk (DPIRD-016)
- Soil and Landscape Quality – Water Erosion Risk (DPIRD-013)
- Soil and Landscape Quality – Waterlogging Risk (DPIRD-015)
- Soil and Landscape Quality – Water Repellence Risk (DPIRD-014)
- Soil and Landscape Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil and Landscape Quality – Phosphorus Export Risk (DPIRD-010)
- Soil and Landscape Quality – Salinity Risk (DPIRD-009)

Restricted GIS Databases used:

- Black Cockatoo Roost Sites
- Black Cockatoo Records
- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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