



Environmental Protection Authority

Secretary
Western Australian Planning Commission
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ATTENTION: Mr Anthony Muscara

Dear Sir/Madam

DECISION UNDER SECTION 48A(1)(a)
Environmental Protection Act 1986

SCHEME AMENDMENT TITLE: Metropolitan Region Scheme Amendment 1270/41
- Ocean Reef Marina Redevelopment
RESPONSIBLE AUTHORITY: Western Australian Planning Commission
DECISION: Scheme Amendment Not Assessed – Advice Given
(no appeals)

Thank you for referring the above scheme amendment to the Environmental Protection Authority (EPA).

After consideration of the information provided by you, the Environmental Protection Authority (EPA) considers that the proposed scheme amendment should not be assessed under Part IV Division 3 of the *Environmental Protection Act 1986* (EP Act) but nevertheless provides the attached Statement of Reasons and Public Advice.

For the purposes of Part IV of the EP Act, the scheme amendment is defined as an assessed scheme amendment.

There is no appeal right in respect of the EPA's decision on the level of assessment of scheme amendments.

A copy of this advice will be sent to relevant authorities and made available to the public on request.

Yours faithfully


Darren Foster
Director
Strategic Policy and Planning Division

9 June 2014

Att

METROPOLITAN REGION SCHEME AMENDMENT NO. 1270/41
OCEAN REEF MARINA REDEVELOPMENT

STATEMENT OF REASONS AND PUBLIC ADVICE

Background

On 9 May 2014, the Western Australian Planning Commission (WAPC) referred Metropolitan Region Scheme (MRS) Amendment 1270/41 Ocean Reef Marina Redevelopment to the Environmental Protection Authority (EPA). The EPA received the referral on 12 May 2014. The EPA has determined that the Amendment does not require assessment under Division 3 Part IV of the Environmental Protection Act 1986 (the EP Act) for the reasons set out below.

In making this determination, the EPA also formed the view that sufficient information is not available at this stage regarding the nature of the impacts on the environment arising from the implementation, operation and management of the marine infrastructure components associated with the scheme amendment. Accordingly, the EPA advises that all environmental impacts associated with the implementation, operation and management of the marine infrastructure components were not assessed as part of the EPA's determination not to assess MRS Amendment 1270/41.

On 26 May 2014, the City of Joondalup referred the marine based components of the Ocean Reef Marina Redevelopment to the EPA as a significant proposal under section 38 of the EP Act. Concurrent with its decision not to assess MRS Amendment 1270/41, the EPA has determined to assess the marine based components of the Ocean Reef Marina Redevelopment under Division 2 Part IV of the EP Act at the level of Public Environment Review.

MRS Amendment 1270/41 Ocean Reef Marina Redevelopment

The purpose of MRS Amendment 1270/41, as described in the referral, is to rationalize various zones and reserves in the MRS to facilitate the redevelopment of the existing Ocean Reef Marina Boat Harbour.

The redeveloped marina would accommodate approximately 750 boat pens, various water related land uses, short-term accommodation, and freehold residential and commercial land uses.

The site is located on the coastal foreshore within the City of Joondalup, approximately 24 kilometres (km) northwest of the Perth central business district and 9 km north of Hillarys Boat Harbour.

The site is located within Bush Forever site 325 which contains regionally significant values and is part of an ecological linkage that extends from Hillarys (Urn Park) to Burns Beach.

Environmental Factors and Objectives

Flora and Vegetation

The EPA's objective for Flora and Vegetation is to maintain representation, diversity, viability and ecological function at the species, population and community level.

Development consistent with MRS Amendment 1270/41 is within Bush Forever site 325. The footprint will directly impact approximately 27.5 hectares of the Bush Forever site. Of this, about 8 hectares is degraded or completely degraded of native

vegetation due to the existing marina and associated infrastructure. Development consistent with MRS Amendment 1270/41 will impact on about 19.5 hectares of native vegetation to be cleared and has the potential to indirectly impact other parts of Bush Forever site 325 through weed invasion, hydrological changes and increased pressure from human access.

To compensate for these potential impacts, the City of Joondalup has identified a number of locations which may be suitable for rehabilitation and addition to the conservation estate, either in isolation or combination.

The EPA is advised that the potential sites will be assessed against the criteria outlined in *State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region* (SPP 2.8). These include that the sites:

- provide better condition/less disturbance compared with the portion of Bush Forever site 325 to be impacted;
- contain 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; and
- enhance biological corridors or ecological linkages between conservation areas.

The EPA is also advised that the WAPC will require that a Negotiated Planning Outcome that secures an appropriate conservation outcome be agreed between the Department of Planning, Department of Parks and Wildlife and the Office of the Environmental Protection Authority before final approval of MRS Amendment 1270/41 is given. The EPA is satisfied that this process will ensure that the EPA's objective for this factor will be met.

Terrestrial Fauna

The EPA's objective for Terrestrial Fauna is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

Development consistent with MRS Amendment 1270/41 is likely to impact Terrestrial Fauna through the removal of habitat. Surveys of the site have observed six species stated as significant fauna in Bush Forever 2000. These species were the White-winged Fairy-wren, Brown Goshawk, Little Eagle, White-browed Scrubwren, New Holland Honeyeater and White-cheeked Honeyeater. Surveys also indicated that the site may have a high diversity of reptiles.

A further 22 species of conservation significance as listed in Bush Forever 2000 are inferred as occurring in the habitat from historical observational data and WA Museum specimens.

In addition, the area is likely to provide feeding habitat for Carnaby's Black Cockatoo (Schedule 1 Wildlife Conservation Act 1950) and Peregrine Falcon (Schedule 2 Wildlife Conservation Act 1950), as well as feeding and breeding habitat for the Rainbow Bee-eater (Schedule 3 Wildlife Conservation Act 1950).

As noted above, to compensate for these potential impacts, the City of Joondalup has identified a number of locations which may be suitable for rehabilitation and addition to the conservation estate, either in isolation or combination. The WAPC will require that a Negotiated Planning Outcome that secures an appropriate conservation outcome be agreed between the Department of Planning, Department of Parks and Wildlife and

the Office of the Environmental Protection Authority before final approval of MRS Amendment 1270/41 is given.

The EPA is satisfied that this process will ensure that the EPA's objective for this factor will be met.

Environmental factors associated with the marine infrastructure components

As noted above, the EPA has formed the view that sufficient information is not available at this stage regarding the nature of the impacts on the environment arising from the implementation, operation and management of the marine infrastructure components associated with the scheme amendment. Accordingly, the EPA advises that all environmental impacts associated with the implementation, operation and management of the marine infrastructure components were not assessed as part of the EPA's determination not to assess MRS Amendment 1270/41. The EPA has determined to assess these environmental impacts under Division 2 Part IV of the EP Act at the level of Public Environmental Review.

EPA Determination

The EPA has determined that MRS Amendment 1270/41 does not require assessment because it is satisfied that the impact development consistent with the Amendment would have on Flora and Vegetation and Terrestrial Fauna, specifically the impact on Bush Forever site 325, will be adequately compensated by the rehabilitation and addition to the conservation estate of suitable site/s under a Negotiated Planning Outcome.

In making this determination, the EPA also formed the view that sufficient information is not available at this stage regarding the nature of the impacts on the environment arising from the implementation, operation and management of the marine infrastructure components associated with the scheme amendment. Accordingly, the EPA advises that all environmental impacts associated with the implementation, operation and management of the marine infrastructure components were not assessed as part of the EPA's determination not to assess MRS Amendment 1270/41. The EPA has determined to assess these environmental impacts under Division 2 Part IV of the EP Act at the level of Public Environmental Review.



Ocean Reef Marina

Bush Forever Negotiated Planning
Outcome

DRAFT

Prepared for
City of Joondalup
by Strategen

February 2016



STRATEGEN
environmental consultants

Ocean Reef Marina

Bush Forever Negotiated Planning
Outcome

DRAFT

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February 2016

Limitations

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Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: City of Joondalup

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	A	Client review	T Stehbens, R Chesney, L Adams / L Taylor	Electronic	30/04/2015
Draft Report	B	Client review	L Adams	Electronic	05/05/2015
Draft Report	C	Agency informal review	L Adams	Electronic	13/08/2015
Final Draft Report	D	Agency review	L Adams	Electronic	25/08/2015
Final Draft Report	E	Agency review	L Adams	Electronic	17/09/2015
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Final Report					

Filename: COJ13066_01 R009 Rev F - 11 February 2016

Executive Summary

The City of Joondalup (the City) proposes to develop the Ocean Reef Marina development (the Proposal) to provide a world class recreation, residential, boating and tourism development, with social and economic benefits to the community.

The Proposal will result in the clearing of 16.79 ha of Degraded to Excellent vegetation within Bush Forever site 325 (BF 325) in an area which was recognised in Bush Forever (Government of Western Australia 2000) as being a 'Possible Future Strategic Regional Recreation and Tourism Node'.

The City, as the Proponent for the Proposal, is committed to the provision of a Negotiated Planning Outcome (NPO) that mitigates the proposed clearing within BF 325 and secures an appropriate conservation outcome. In its decision not to assess the Metropolitan Regional Scheme (MRS) amendment for the Proposal, the Environmental Protection Authority (EPA) noted that the Western Australia Planning Commission (WAPC) will require a NPO that secures an appropriate conservation outcome before final approval of the MRS Amendment is given.

The key impacts of the Proposal to BF 325 are

- 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
- partial interruption of north south linkage values
- loss of habitat for fauna species
- 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.

BF 325 represents a linkage between adjacent bushland to the east and is recognised as part of a regionally significant fragmented bushland/wetland linkage. Impacts to BF 325 will be minimised as far as practicable through the following management techniques:

1. Retention of a north-south linkage of remnant vegetation between Ocean Reef Rd and the Proposal area (with the exception of entry roads).
2. The Proposal boundary was designed to avoid areas of Excellent vegetation to the northeast of the existing Boat Harbour.
3. The Proposal area was decreased from early proposed designs (as shown in Mattiske 2013) to minimise vegetation clearing and the Proposal boundary was moved slightly west near the entrance from Hodges Drive.
4. A Construction Environment Management Plan will be prepared to support subdivision and will include vegetation clearing protocols which ensure that there are no indirect impacts to adjacent vegetation outside the Proposal boundary.

To mitigate the residual impacts of the Proposal, the City is committed to a NPO that results in an appropriate conservation outcome with consideration of SPP 2.8 and the public advice of the EPA regarding the MRS amendment. The proposed NPO includes the following components:

1. 90% land acquisition: Provision of \$1.6 M of funding to Parks and Wildlife for the acquisition and management of land into the conservation estate. The land acquired will comprise coastal vegetation in similar or better condition and with similar or higher conservation value than the area to be cleared.
2. 10% rehabilitation within BF 325: Rehabilitation of 5 ha of degraded vegetation within BF 325 to at least Very Good condition within five years.

This NPO is expected to provide an overall positive environmental outcome with local improvement of BF 325 and an increase in the area of coastal vegetation protected in the conservation estate.

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1. Introduction

The City of Joondalup (the City) proposes to develop the Ocean Reef Marina development (the Proposal) to provide a world class recreation, residential, boating and tourism development, with social and economic benefits to the community. The Proposal is located on the coastal foreshore, approximately 6 km east of the Joondalup City Centre and 9 km due north of Hillary's Boat Harbour. The Proposal is adjacent to, and extends into both the Marmion Marine Park and Bush Forever site 325 (BF 325).

The Proposal provides for an expansion of the existing Ocean Reef Boat Harbour west of Boat Harbour Quays; north to the alignment of Resolute Drive and south to the alignment of Swanson Way. The Concept Plan prepared for the Proposal proposes a mixed use marina enabling club, service commercial and marine industrial uses in the north; a central retail, tourist and residential precinct; and a southern trailer boating precinct inclusive of ramps, coastal amenities and parking.

The City purchased freehold land for the purpose of the future development of the site as a marina in 1979 prior to the Bush Forever planning undertaken for the Perth Metropolitan area. In recognition of the potential for future development on this site, the Proposal area was acknowledged as a 'Possible Future Strategic Regional Recreation and Tourism Node' in Bush Forever (Government of Western Australia 2000).

The City is currently working with the State Government to develop a renewed and expanded Ocean Reef Marina Memorandum of Understanding (MOU). The renewed and expanded MOU will seek to ensure the collaborative approach, articulated in the original MOU, is maintained to ensure the best outcome for the Ocean Reef Marina development is obtained. The MOU is considered critical to providing the framework for the State Government commitment to, and resourcing of, the Proposal.

The Proponent for the Proposal is currently the City of Joondalup. If the proponency is transferred to another entity in the future, implementation of this Negotiated Planning Outcome (NPO) will become the full responsibility of the new Proponent.

1.1 Negotiated Planning Outcome for Bush Forever Site 325

The Proposal includes land development which necessitates the excision of 26.3727 ha of BF 325, including about 16.79 ha of native vegetation. The City is committed to the provision of a NPO that mitigates the proposed clearing within BF 325 and secures an appropriate conservation outcome. In its decision not to assess the Metropolitan Regional Scheme (MRS) amendment for the Proposal, the Environmental Protection Authority (EPA) noted that the Western Australia Planning Commission (WAPC) will require a NPO that secures an appropriate conservation outcome agreed between the Department of Planning (DoP), Department of Parks and Wildlife (Parks and Wildlife) and the Office of the Environmental Protection Authority (OEPA) before final approval of MRS Amendment 1270/41 is given.

The NPO takes into account:

- public advice of the EPA regarding the MRS Amendment given on 9 June 2014
- State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region
- environmental values of BF 325.

The mechanism for requiring the implementation of the NPO as part of the Proposal and the associated Responsible Authority will be determined before the final approval of the MRS amendment is given.

1.2 Planning and environmental approvals process

A MRS amendment has been initiated by the WAPC to enable the appropriate MRS zonings to be established to facilitate the future development of the Proposal. The amendment is consistent with an existing MOU between the City and the Government of Western Australia which recognises the importance of the Proposal. In accordance with the MOU, the City is preparing a Local Structure Plan (LSP) that will be adopted under Part 9 of the City's *District Planning Scheme No 2*. The LSP will provide additional detail and further design interrogation of the Concept Plan and will be used to guide future development and construction works accordingly.

The MRS amendment prepared to facilitate the Proposal was referred to the EPA under Section 48A of the *Environmental Protection Act 1986* (EP Act) on 9 May 2014. The EPA determined that the amendment did not require formal assessment given the terrestrial aspects could be adequately managed through the relevant planning processes and the marine component would be considered under Section 38 of the EP Act. The EPA provided a 'Statement of reasons and public advice' for this decision on 9 June 2014. For the purposes of Part IV of the EP Act, the MRS amendment is defined as an assessed scheme amendment.

The marine component of the Proposal was separately referred to the EPA under s38 of the EP Act on 23 May 2014. The EPA determined on 6 June 2014 that the marine component of the Proposal would be assessed at a Public Environmental Review (PER) level of Assessment with an eight week public comment period.

1.3 Purpose of this document

This NPO has been prepared to outline how the proposed clearing within BF 325 will be mitigated through land acquisition and rehabilitation.

This document provides the information that would usually be required for a Statement of Environmental Effects, as detailed in Appendix 1 of State Planning Policy 2.8 *Bushland Policy for the Perth Metropolitan Region* (SPP 2.8, WAPC 2010) (refer to Section 2.5). Table 1 outlines the requirements of a Statement of Environmental Effects and identifies the relevant sections in this document where this information is provided.

Table 1: Statement of Environmental Effects, SPP 2.8

Requirements of a Statement of Environmental Effects	Relevant section (s)
1. provide evidence and demonstrate that a proposal or decision is consistent with this policy, in particular the planning assessment criteria set out in Appendix 2;	Sections 2.5 and 5
2. describe and provide a rationale and planning context for the Proposal;	Section 2
3. describe the impacted area's bushland values and environmental attributes (to be consistent with the information sets in <i>Bush Forever</i> and with reference to the site descriptions therein; and Environmental Protection Authority Guidance Statements 51 and 56 (EPA 2003b and 2003c), where appropriate);	Section 3
4. demonstrate that all reasonable steps have been taken to avoid or minimise any likely adverse impacts consistent with the requirements of this policy, including a review of reasonable alternatives and details of any bushland sensitive design measures to be adopted;	Section 4.1
5. provide an evaluation of and justification for any likely adverse impacts;	Section 4.2
6. provide an environmental and/or bushland management plan, where appropriate, and details of proposed conservation management measures to be adopted; or, where agreed, the environmental and/or bushland management plan or related measures may be a requirement through the statutory planning process; and	Section 5.2
7. provide details of proposed long-term protection, management, offset measures and implementation commitments to be adopted.	Sections 5

2. Planning context

2.1 Project justification

The Proposal has been planned for over thirty years since the land was purchased by the City for the purpose of a marina in 1979. More recently, the Ocean Reef Marina has been included in City planning documents such as the Strategic Community Plan, Draft Local Planning Strategy and Economic Development Strategy as a transformational project and a priority for the City. The Proposal is regarded as a catalyst for regional tourism, economic development and residential diversity.

The Perth Recreational Boating Facilities Study prepared by the then Department of Planning and Infrastructure (DPI) in 2008, identified the future demand for marina facilities and anticipated growth in demand along the North Coast, including Joondalup, and identified Ocean Reef as a location for a new harbour, additional boat pens and facilities. The DoP population forecasts released in 2012 for the period to 2026 show continued strong growth. The Proposal will satisfy part of the regional demand for boating facilities and the associated urban development will both complement and fund the recreational facilities.

2.2 Metropolitan Region Scheme

The Proposal area is currently zoned 'parks and recreation', 'waterways' and 'public purpose'. A MRS amendment has been initiated by the WAPC to enable the appropriate MRS zonings to be established to facilitate the future development of the Proposal.

2.3 City of Joondalup District Planning Scheme No. 2

The City of Joondalup District Planning Scheme No. 2 outlines the permissible uses and relevant standards pertaining to development within each of its various identified zones. The Proposal area is zoned partly for Public Purposes (Special Uses) with the remainder reserved for 'Parks and Recreation'. A Local Structure Plan is being developed to support a scheme amendment in parallel with the MRS amendment.

2.4 Bush Forever

Bush Forever (Government of Western Australia 2000a, 2000b) identifies 51 200 ha of regionally significant bushland (and any associated wetlands) on the Swan Coastal Plain within the Perth Metropolitan Region for protection and management in 287 discrete sites. These sites are selected based on criteria generally relating to the nature and condition of existing native vegetation and its value in maintaining ecological linkages (Government of Western Australia 2000a).

Within the limits of the available natural areas, Bush Forever aims to identify a comprehensive, adequate and representative system of reserved and protected areas in the Perth Metropolitan Region portion of the Swan Coastal Plain (Government of Western Australia 2000a).

The land component of the Proposal area is almost entirely within BF 325 (including the existing boat harbour), except for the portion associated with the Water Corporation's ocean outfall from the Beenyup Waste Water treatment plant. BF 325 is a semi-contiguous north-south coastal strip of native vegetation between Burns Beach and Hillarys and covers approximately 195.3ha.

While there is a general presumption against clearing of existing Bush Forever reserves, there is prior recognition of the Proposal area as a 'Possible Future Strategic Regional Recreation and Tourism Node' in Bush Forever (Government of Western Australia 2000a).

2.5 State Planning Policy 2.8

State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region (SPP 2.8) addresses the protection and management of regionally significant bushland identified for protection in Bush Forever (WAPC 2010).

The Proposal area is located within an existing Bush Forever reserve for the purpose of SPP 2.8 (WAPC 2010). The offset criteria outlined in SPP 2.8 are relevant to the assessment of the NPO for BF 325. The criteria define that the NPO:

- provide better condition vegetation/less disturbance compared with the portion of BF 325 to be 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.

SPP 2.8 provides guidance regarding potential environmental offset ratios applicable to Bush Forever sites. Under the offset criteria outlined in Appendix 4 of SPP 2.8, an offset ratio of at least:

- 2:1 for offsets addressing impacts to Bush Forever sites of Very High conservation significance,
- 1.5:1 for sites of High conservation significance
- 1:1 for sites of Medium or Low conservation significance.

The Proposal area has been assessed as being of High conservation significance based on the following site characteristics (further outlined in Section 3):

- presence of Priority flora and inferred presence of Priority Ecological Communities (PEC)
- absence of Threatened flora or Threatened Ecological Communities (TEC)
- the condition of the vegetation to be cleared (predominantly Good to Excellent, with some Degraded areas)
- the context of the Proposal area within a large urban coastal vegetation remnant which is part of the north-south corridor of vegetation within BF 325.

SPP 2.8 states that for an area of High conservation significance, *at least* 75% of the mitigation package should be land acquisition with a maximum of 25% comprising revegetation.

3. Environmental values of the Proposal area

The land component of the proposed Ocean Reef Marina is almost entirely within BF 325 except a small area in the south associated with the Water Corporation's ocean outfall from the Beenyup Wastewater Treatment Plant. The total size of the land component of the Proposal is 28.16 ha, of which 27.5 ha is within BF 325. Of this 27.5 ha, about 16.79 ha comprises remnant vegetation, 8.71 ha is already cleared, and 2.66 ha has been mapped as bare sand or limestone. It should be noted that these figures have been updated since submission of the MRS amendment, based on detailed mapping.

3.1.1 Bush Forever Site 325

BF 325 contains vegetation of the Cottesloe Complex: Central and South and the Quindalup Complex and is managed by the City of Joondalup. BF 325 comprises a long strip of coastal foreshore running from Burns Beach in the north to Hillarys in the south, and contains approximately 195 ha of remnant vegetation (Government of Western Australia 2000a, 2000b). BF 325 is part of a semi-contiguous vegetated coastal strip containing shoreline with soft (sandy) and hard (limestone rocks) areas (Western Australian Planning Commission 2000b).

3.1.2 Vegetation

On a regional scale, vegetation of the Proposal area falls within the Quindalup Complex, with some influence from the Cottesloe Complex: Central and South (Mattiske 2013). The vegetation types mapped included shrubland/scrubland and heath communities with a clear coastal mosaic of vegetation types, with occurrence primarily determined by dune type and position (Mattiske 2013). The H1 community was the most common vegetation type mapped and comprises a characteristic coastal heath community (Table 2, Figure 1)

Vegetation condition of the Proposal area and surrounds was assessed as ranging from Completely Degraded (cleared) to Excellent with the majority of the survey area being in Good to Very Good condition (Table 3, Figure 2) based on the Mattiske (2013) mapping. Widespread and sustained weed invasions have resulted in high weed densities, and have replaced native understory in many instances (Mattiske 2013). The Proposal avoids the majority of vegetation in excellent condition, with over 60% of the vegetation to be cleared being in Good to Very Good condition.

Table 2: Vegetation types of proposed clearing within BF 325

Vegetation type	Area (ha)
S1: Mid closed scrubland of <i>Acacia rostellifera</i> and <i>Melaleuca huegelii</i> with occasional emergent <i>Banksia sessilis</i> var. <i>cygnorum</i> over <i>Spyridium globulosum</i> , <i>Rhagodia baccata</i> subsp. <i>dioica</i> and <i>Hibbertia cuneiformis</i> over <i>Acanthocarpus preissii</i> , <i>Clematis linearifolia</i> , <i>Hardenbergia comptoniana</i> and mixed exotics on deep grey sands of primary and secondary dunes.	3.04
S2: Tall shrubland of <i>Banksia sessilis</i> var. <i>cygnorum</i> , <i>Spyridium globulosum</i> , <i>Santalum acuminatum</i> and <i>Acacia saligna</i> with occasional emergent <i>Eucalyptus tottiana</i> over <i>Rhagodia baccata</i> subsp. <i>dioica</i> , <i>Alyogyne huegelii</i> and <i>Trymalium odoratissimum</i> over <i>Conostylis bracteata</i> (P3), <i>Desmocladius asper</i> , <i>Lepidosperma pubisquameum</i> and mixed exotics on deep grey or brown sands of secondary dune swales.	0.86
S3: Tall shrubland of <i>Spyridium globulosum</i> , <i>Acacia rostellifera</i> , <i>Banksia sessilis</i> var. <i>cygnorum</i> and <i>Santalum acuminatum</i> over <i>Phyllanthus calycinus</i> , <i>Hibbertia hypericoides</i> and <i>Melaleuca systena</i> over <i>Clematis linearifolia</i> , <i>Austrostipa flavescens</i> , <i>Desmocladius flexuosus</i> and mixed exotics on light grey or brown sands of secondary dune swales.	1.91
S4: Mid to tall scrubland of <i>Acacia rostellifera</i> , <i>Spyridium globulosum</i> , <i>Templetonia retusa</i> , <i>Melaleuca huegelii</i> and <i>Melaleuca cardiophylla</i> over <i>Leucopogon parvifolius</i> , <i>Thomasia cognata</i> , <i>Acanthocarpus preissii</i> , <i>Phyllanthus calycinus</i> and mixed exotics on grey sands of secondary dunes with frequent limestone outcropping.	0.89

Vegetation type	Area (ha)
S5: Tall closed shrubland of <i>Acacia cochlearis</i> , <i>Acacia cyclops</i> , <i>Acacia rostellifera</i> , <i>Allocasuarina lehmanniana</i> subsp. <i>lehmanniana</i> , <i>Melaleuca huegelii</i> and <i>Templetonia retusa</i> over <i>Melaleuca systema</i> , <i>Scaevola crassifolia</i> and mixed exotics on grey sands of secondary dune swales with frequent limestone outcropping.	0.08
H1: 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.	7.64
H2: Open heath of <i>Melaleuca systema</i> , <i>Acanthocarpus preissii</i> , <i>Leucopogon insularis</i> and <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> with emergent <i>Acacia rostellifera</i> and <i>Santalum acuminatum</i> over <i>Lomandra maritima</i> , <i>Conostylis bracteata</i> (P3), <i>Poa drummondii</i> and mixed exotics on grey sands of secondary dune slopes.	0.70
H4: Low open scrub to heath of <i>Acacia rostellifera</i> , <i>Spyridium globulosum</i> and <i>Acacia saligna</i> over <i>Melaleuca systema</i> , <i>Acanthocarpus preissii</i> , <i>Olearia axillaris</i> , <i>Phyllanthus calycinus</i> and mixed exotics on white to light grey sands of primary and secondary dune crests.	1.08
DS: Degraded dune swale.	0.23
FR: Foredune rehabilitation.	0.36
TOTAL	16.79 ¹

Table 3: Vegetation condition of proposed clearing within BF 325

Vegetation condition	Area (ha)	Proportion
Degraded	1.10	6.55%
Degraded to Good	1.80	10.71%
Good	4.46	26.57%
Very Good	6.08	36.22%
Very Good to Excellent	0.27	1.61%
Excellent	3.08	18.35%
TOTAL	16.79	100%

3.1.3 Ecological communities

No Threatened Ecological Communities (TECs) have been identified as existing within the Proposal area. Three Priority 3 Ecological Communities (PECs) were inferred to occur across the majority of the Proposal area and adjacent BF 325 (Mattiske 2013):

- Swan Coastal Plain (SCP) 24 – Northern Spearwood shrublands and woodlands
- SCP 29a – Coastal shrublands on shallow sands, southern Swan Coastal Plain
- SCP 29b – *Acacia* shrublands on taller dunes, southern Swan Coastal Plain.

Ecological communities identified as threatened, but not listed as TECs, can be classified as PECs. These communities are under threat, but there is insufficient information available concerning their distribution to make a proper evaluation of their conservation status. Parks and Wildlife categorises PECs according to their conservation priority, using five categories, P1 to P5, to denote the conservation priority status, with P1 communities being the most threatened and P5 the least.

¹ Note that there is a slight mapping discrepancy between the total area of vegetation mapped by type (16.69 ha) and the total area by condition (16.79 ha). The discrepancy of 0.1 ha is likely to be a result of the digitisation process following hand mapping of the units. To be conservative, the larger vegetation area of 16.79 (adding 0.1 ha to the largest H1 unit) has been used throughout the document when discussing the maximum amount of vegetation clearing for the Proposal.

3.1.4 Flora

No Threatened flora species have been identified within the subject site during surveys, including the most recent spring survey undertaken by Mattiske (2013). Mattiske (2013) recorded two state listed Priority flora species: *Grevillea* sp. Ocean Reef (Priority 1) and *Conostylis bracteata* (Priority 3). *Conostylis bracteata* is relatively common and the proposed development is unlikely to alter the conservation status of this species. *Grevillea* sp. Ocean Reef is less well conserved and this is the only known population of the Ocean Reef species in the database of the Western Australian Herbarium. The mapped locations of *Grevillea* sp. Ocean Reef occur outside of the Proposal area (Mattiske 2013).

3.1.5 Fauna

A Level 1 fauna assessment was undertaken by Western Wildlife in 2008, including a desktop assessment and site survey. Based on available habitat, only four conservation significant species were considered likely to occur in the Proposal area: Carnaby's Black-Cockatoo, Rainbow Bee-eater, Black-Striped Snake and Quenda (Western Wildlife 2008).

Carnaby's Black-Cockatoo

Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This species is endemic to the south-west of Western Australia, mainly occurring in uncleared remnant native eucalypt woodlands, especially those that contain Salmon gum and wandoo, and in shrubland or kwongan heathland dominated by *Hakea*, *Dryandra*, *Banksia* and *Grevillea* species (DSEWPac 2012).

The Proposal area does not contain any trees suitable for Carnaby's Black-Cockatoo nesting hollows. However, it does contain a number of flora species that may be used as food sources, primarily *Banksia sessilis*. Accordingly, it is expected that Carnaby's Black-Cockatoo will not reside in the Proposed Action area but may visit the site to feed.

Approximately 0.43 ha of suitable foraging habitat for Carnaby's Black-Cockatoo will be cleared within the Proposal area (Strategen 2014). This potential habitat ranges in condition from 'Degraded' to 'Very Good'.

The Proposal was referred under the EPBC Act and resulted in a Not a Controlled Action decision.

Rainbow Bee-eater

The Rainbow Bee-eater (*Merops ornatus*) is a common summer visitor to Perth, where it breeds in sandy banks (Western Wildlife 2008). This species will forage and breed in relatively degraded areas and is likely to be a breeding visitor to the Proposal area. Development of the site may result in the loss of some nesting sites; however, the Rainbow bee-eater is common and populations of this species are unlikely to be significantly affected by the Proposal.

Black-striped Snake

The Black-striped Snake is a Priority 3 listed species restricted to coastal plains between Mandurah and Lancelin and as such is vulnerable to habitat loss, primarily resulting from urban development (Western Wildlife 2008). The Black-striped Snake is known to occur in *Banksia* and *Eucalyptus* woodlands. The species has the potential to occur in the subject site as suitable habitat exists; the Proposal therefore has the potential to result in the loss of some habitat.

Quenda

The Quenda is known to occur in areas with dense understorey and is often particularly common in dense wetland vegetation (Western Wildlife 2008). The Quenda has been recorded nearby as identified in Parks and Wildlife Threatened and Priority Fauna database (Western Wildlife 2008). Characteristic diggings of the species were not observed in the subject site, however Quenda may occur. The Proposal therefore has the potential to result in loss of some habitat (Western Wildlife 2008).

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Figure 1: Ocean Reef Marina Development vegetation type

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Figure 2: Ocean Reef Marina Development vegetation condition

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4. Evaluation of impacts

4.1 Avoidance and minimisation of impacts

BF 325 represents a linkage between adjacent bushland to the east and is recognised as part of a regionally significant fragmented bushland/wetland linkage. Impacts to BF 325 will be minimised as far as practicable through the following management techniques:

1. Retention of a north-south linkage of remnant vegetation between Ocean Reef Rd and the Proposal area (with the exception of entry roads).
2. The Proposal boundary was designed to avoid areas of Excellent vegetation to the northeast of the existing Boat Harbour (Figure 2).
3. The Proposal area was decreased from early proposed designs (as shown in Mattiske 2013) to minimise vegetation clearing and the Proposal boundary was moved slightly west near the entrance from Hodges Drive.
4. A Construction Environment Management Plan will be prepared to support subdivision and will include vegetation clearing protocols which ensure that there are no indirect impacts to adjacent vegetation outside the Proposal boundary.

4.2 Overview of residual impacts

The Proposal area has been assessed as being of High conservation significance. The key impacts of the Proposal to BF 325 are

- 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 PECs; SCP 24, SCP 29a and SCP 29b
- partial interruption of north south linkage values
- loss of habitat for fauna species
- 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.

5. Mitigation of residual impacts

The key policy relevant to the mitigation of residual impacts on Bush Forever is SPP 2.8. On the basis that the Proposal area has been assessed as having a High conservation value; an offset ratio of 1.5:1 would be applicable (refer to Section 2.5).

As the Proposal will affect 16.79 ha of remnant vegetation in Degraded to Excellent condition, a minimum of 25.2 ha would be required for an appropriate mitigation package in the NPO. SPP 2.8 states that for an area of High conservation significance, at least 75% of the mitigation package should be land acquisition with a maximum of 25% comprising revegetation. In this case, the NPO mitigation package includes 90% land acquisition which meets the SPP 2.8 guidance and focuses on land acquisition in accordance with the EPA advice:

“... the impact on Bush Forever site 325, will be adequately compensated by the rehabilitation and addition to the conservation estate of suitable site/s under a Negotiated Planning Outcome”.

The proposed components of the NPO are:

- approximately 90% (minimum 22.7 ha) of the NPO requirements to be met through direct acquisition of property, to be transferred to conservation estate, Section 5.1
- approximately 10% of the NPO requirements to be met through rehabilitation of BF 325 in areas adjacent to the Proposal area, as detailed in Section 5.2.

The application of 1.5:1 SPP 2.8 ratio would equate to 2.5 ha for the 10% rehabilitation component of the NPO. However, the quantum of vegetation rehabilitation required should be determined based on the vegetation condition of the area to be cleared and the condition improvements gained from rehabilitation. The proposed rehabilitation is for the improvement of Degraded to Good vegetation to a condition rating of at least Very Good. As the area to be cleared is predominately Good to Very Good, it has been assumed that twice the minimum area (5 ha rather than 2.5 ha) should be rehabilitated to provide an appropriate conservation outcome.

5.1 Land acquisition

This NPO is based on a land acquisition commitment by the Proponent to acquire land for inclusion in the conservation estate, which is intended to make up approximately 90% of the NPO 'package'. The land acquisition site is to be assessed against the criteria in SPP 2.8.

The City has consulted with Parks and Wildlife to identify potential land acquisition sites that may meet the above criteria in relation to the Proposal area. Several sites have been discussed to date with Parks and Wildlife, including a site adjacent to the Yanchep National Park and other sites north of Seabird.

There are inherent difficulties with committing to the acquisition of a specific site prior to project approval, including:

- the land acquisition requires the agreement of a third party (the landowner) to sell
- the time lag between when the NPO must be agreed (prior to advertising of the MRS amendment) and when the Proposal is approved (and funds made available for land acquisition)
- potential for changes in circumstances for a particular property during the approval process, for example; a change in land ownership, a change in vegetation condition due to fire or clearing or a change in the expected sale price
- linking a project approval with a particular property could increase the price of that acquisition.

The above uncertainties make the commitment to purchase a particular property impractical early in the planning and environmental approval process as an agreed acquisition site could become unavailable or unsuitable for purchase. The values of the ORM project site are specifically coastal vegetation related and there are limited sites available to consider for acquisition. Therefore, as no purchase can be made prior to project approval, this NPO cannot identify specific sites.

Given the above constraints, the proposed land acquisition component of the NPO is the provision of a funding commitment of \$1.5 M (indexed appropriately) for acquisition of a property (or part thereof) to be purchased by Parks and Wildlife in accordance with a set of agreed decision criteria. The decision criteria will include minimum criteria requirements followed by other desirable criteria. This approach is proposed in recognition of the challenges in finding the 'ideal' coastal acquisition site and to recognise Parks and Wildlife priorities for conservation.

5.1.1 Basis for land acquisition funding

Following the assessment of impacts under SPP 2.8, a minimum of 25.2 ha is required to meet the expectations of SPP 2.8 for the NPO. Accordingly, the structure of the NPO has been determined as follows:

- approximately 90% (minimum 22.7 ha) of the Negotiated Planning Outcome requirements to be met through direct acquisition of property, to be transferred to conservation estate
- approximately 10% (5 ha) of the Negotiated Planning Outcome requirements to be met through rehabilitation of BF 325 (refer to Section 5.2).

Land values vary enormously and can be very high in the coastal strip near urban development. However, vegetated sites with high conservation values and therefore little potential for development generally have lower values than adjacent cleared areas. The sites suggested by Parks and Wildlife as potentially suitable as land acquisition sites (although larger than required) have land values of approximately \$5000/ha and \$60 000/ha respectively. The proposed land acquisition funding of \$1.5 M would be sufficient to purchase at least 25 ha at the higher price of \$60 000/ha, which would still exceed the requirements of SPP 2.8.

In addition to the purchase price of up to \$1.5 M, an additional \$0.1 M has been included as a management contribution which could be used for fencing, weed control or access management to minimise threatening processes.

5.1.2 Site selection

The key environmental value of BF 325 and the area that is proposed to be cleared for the ORM project is coastal vegetation. The acquisition and protection of inland vegetation types would therefore not be an appropriate conservation outcome to adequately compensate for the impacts to BF 325.

The proposed minimum site selection criteria are:

- minimum of 22.7 ha of native vegetation in Very Good to Excellent condition
- within 10 km of the coast
- contain conservation significant species and communities of similar value and priority for protection
- contain vegetation communities as similar as practicable to the impacted site
- occur within the Perth subregion of the Swan Coastal Plain bioregion.

The proposed desirable criteria are:

- have an improved area to perimeter ratio than the impacted site
- are contiguous with an existing conservation area
- enhance biological corridors or ecological linkages between conservation areas.

A site that meets *all* of the above criteria may be difficult to find at the time of land acquisition. The criteria above are therefore broken into minimum requirements and 'desirable' criteria in recognition of the limited availability of remnant vegetation in private ownership adjacent to an existing conservation estate in the coastal area near the ORM site. The minimum site selection criteria will ensure that an adequate area of coastal vegetation in better condition than the ORM site and containing high environmental values will be acquired. This will ensure that an appropriate positive conservation outcome is achieved.

The desirable criteria will guide site selection by Parks and Wildlife to ensure that, as far as practicable, the site should have similar vegetation to the ORM site and be adjacent to an existing conservation area. If the site to be acquired is within the Perth Metropolitan area, the intention is that it would become a Bush Forever site.

5.1.3 Examples of how the land acquisition fund could be utilised

The \$1.6 M could be used to:

- purchase 25 ha of a largely uncleared property (or part thereof) in the northern Metropolitan area for contribution into adjacent conservation estate, or
- purchase a much larger area (e.g. 300 ha) uncleared land north of the Metropolitan area in an area that has been identified as a priority for conservation by Parks and Wildlife for the establishment of a new conservation reserve, or
- purchase of a lower value site (e.g. \$1M) that still meets the minimum criteria above with use of the remaining funds for rehabilitation and management – potentially in an area where ecological linkages can be improved through the protection of existing Very Good to Excellent condition vegetation and rehabilitation of degraded land
- purchase of a lower value site that still meets the minimum criteria above and use of the remaining funds to contribute to future land acquisition by Parks and Wildlife.

5.1.4 Process for land acquisition

The Proponent would be required as part of this NPO to provide \$1.6 M (indexed appropriately from current values) to Parks and Wildlife at least 12 months prior to the commencement of construction of the Proposal.

Parks and Wildlife would then identify a site, sites or part of a site that meets the above minimum site selection criteria and as many desirable site selection criteria as possible and provide a Land Acquisition Proposal to the Responsible Authority within 12 months that includes:

- property details of the site, sites or part of a site that is to be purchased
- expected date and cost of purchase
- vegetation type and condition
- conservation mechanism following purchase
- details of how the \$0.1 M management contribution will be spent
- if the property purchase price is expected to be <\$1.5 M, details of how the remaining money will be spent.

It is intended that the acquisition of the site, sites or part of a site should occur prior to clearing of BF 325.

5.2 Bush Forever Site 325 rehabilitation

The Proposal involves clearing within BF 325 and the rehabilitation component of the NPO is focussed on providing a local benefit to the Bush Forever site within the immediate vicinity of the Proposal. The proposed NPO includes the rehabilitation of 5 ha of Degraded vegetation between the Proposal area and Ocean Reef Road. This will be complemented by other access management, fencing and educational signage undertaken as part of the Proposal.

5.2.1 NPO Rehabilitation area

The rehabilitation component of the NPO within BF 325 will be undertaken by the Proponent between the Proposal area and Ocean Reef Road to ensure a local ecological benefit and maximise the north-south linkage values of the vegetation to be retained. This area will be referred to as the 'NPO rehabilitation area'. The actual location of the 5 ha of rehabilitation will be determined following detailed site assessment and rehabilitation planning to maximise the ecological benefit and likelihood of rehabilitation success.

Large areas of BF 325 surrounding the Proposal area have been mapped as being in Degraded to Good condition by Mattiske (2013) (Figure 1, Figure 2). The Keighery (1994) definitions for Degraded and Good condition vegetation are:

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 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 frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

Vegetation in Degraded to Good condition has clear scope for rehabilitation such as weed control and infill planting, with an increase in vegetation condition to Very Good (vegetation structure altered, obvious signs of disturbance). For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing) potentially achievable over a number of years. Based on the Mattiske (2013) vegetation condition mapping of BF 325 vegetation (not including the Proposal area), approximately 44% of this area is in Degraded, Degraded to Good or Good and could be targeted for rehabilitation works; equating to 13.72 ha (Table 4). The NPO rehabilitation area would be within this 13.72 ha.

Table 4: Vegetation condition of BF 325 outside of the Proposal area

Vegetation condition	Area (ha)	Proportion
Bare sand or limestone	0.35	1.14%
Cleared	1.61	5.18%
Degraded	1.93	6.21%
Degraded to Good	2.50	8.07%
Good	9.29	29.96%
Very Good	6.90	22.25%
Very Good to Excellent	1.58	5.10%
Excellent	6.85	22.09%
TOTAL	31.02	100%

The proposed NPO rehabilitation plan is outlined in Section 5.2.3.

5.2.2 Current management of Bush Forever Site 325

BF 325 is currently undertaken by the City and is detailed in the *Coastal Foreshore Management Plan 2014-2024* (Natural Area Consulting 2014). This plan covers the management of approximately 17 km of coastal foreshore reserve, including foreshores of Burns Beach, Iluka, Ocean Reef, Mullaloo, Whitfords, Sorrento and Marmion. This includes the whole of BF 325 and a number of additional smaller reserves.

The City emphasises working on maintaining and improving areas in good or better condition to prevent further degradation through ongoing maintenance and improvement rather than repairing larger scale environmental damage (Natural Area Consulting 2014). However, the City recognises the importance of the aesthetic appeal of the dunes and also undertakes bushland regeneration in degraded areas that are in public view (Natural Area Consulting 2014). Funding constraints limit the extent of works that are possible within BF 325 to maintenance level activities, rather than large-scale enhancement works.

Existing infrastructure

A dual use path extends along the entire length of BF 325, from Burns Beach down to Waterman's Bay. Formal access to the beach is provided via access from car parks, the dual use path or other facilities at various localities within BF 325 (Natural Area Consulting 2014). The dual use path continues through the Ocean Reef Marina, and this connection will be preserved by the Proposal.

The Ocean Reef boat harbour facilities include a small marina, boat launching ramps, a large parking area that can accommodate boat trailers, and a small parkland with seats, toilets and play equipment. The site also includes the Whitfords Sea Rescue site and the Ocean Reef Sea Sports Club. The outflow pipes for the Beenypup Wastewater Treatment Plant enter the ocean through a reserve near the marina wall (Natural Area Consulting 2014).

Current infrastructure management focuses on the provision and maintenance/repair of fencing, signage, and the dual use path. Fencing includes black plastic coated conservation fencing, ring-lock with treated pine posts, jarrah posts with stainless steel wire, and limestone fencing. Signage includes hazard warnings, access management, activity management and informative signs providing information about local heritage and environmental values.

Threatening processes and management

BF 325 is subject to considerable threatening processes due to its high perimeter to area ratio, fragmentation and proximity to urban development. Environmental threats include weeds, plant diseases, fire, non-native fauna species, human access and infrastructure.

Current management of BF 325 by the City is outlined below.

Weed control

The City defines significant weeds as those that are:

- listed in the Environmental Weed Strategy for Western Australia
- listed on the DEC Swan Region Environmental Weed List 2009
- Weeds of National Significance (WoNS)
- declared under the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

A total of 36 significant weeds have been identified within the Coastal Foreshore area (Natural Area Consulting 2014).

The City undertakes an integrated approach to weed management, including:

- prevention of introduction of weeds through weed hygiene measures
- regular monitoring and reporting of weed populations
- on ground weed control, including prioritisation of natural areas and priority weeds to target
- community education initiatives
- fire prevention measures.

Monthly weed monitoring is undertaken to establish the extent and distribution of weed species and identify priority weeds. Natural Area Initial Assessments are conducted approximately every 5 years to assess site-specific ecological values, biodiversity significance and threatening processes. On-ground weed management programs are undertaken through the City's Annual Bushland Maintenance Schedule and Weekly Bushland Maintenance Schedules, as well as through engaging contractors.

Community education initiatives around weed awareness undertaken by the City include:

- delivery of gardening workshops
- development and distribution of two weed brochures (Environmental Weeds and Garden Escapees)
- weed education workshops for local Friends Groups.

Rehabilitation

Rehabilitation works undertaken in BF 325 include encouraging natural regeneration, direct seeding and/or planting of tube stock. Rehabilitation activities are carried out through the development of local management plans. Actions are prioritised according to the conservation zone rating and areas of good or better vegetation. Areas treated for weeds are also prioritised for revegetation to discourage colonisation by other opportunistic weed species.

The City employs best practice management for flora and vegetation, including:

- regular assessment of flora and vegetation to enable assessment of management strategy effectiveness and monitor change over time
- the use of local provenance seed and cuttings for flora and vegetation restoration works.

Plant pathogens

There are no recorded areas of plant pathogens in BF 325; however, the City has identified risk of infection by *Phytophthora cinnamomi* (dieback), the related *Phytophthora multivora* (known to be tolerant of alkaline conditions, and so more likely to present a risk to the limestone areas of BF 325), and *Armillaria luteobubalina* (Honey Fungus).

The City has developed a Pathogen Management Plan to protect vegetation and ecosystems by

- establishing the level of risk for areas to be infected by pathogens
- development of preventative and management strategies
- identification of treatment measures for infested areas.

Introduced fauna

The City undertakes control of feral animals, including the removal of cats, under the provision of the *Cat Act 2011*. Feral animal control is undertaken annually and includes biological and chemical control, trapping, baiting, and exclusion methods such as fencing. The City also promotes responsible pet ownership and encourages the community to ensure that domestic pets do not have a negative impact to the natural environment.

Erosion

Erosion of the coastal dune systems occur when there is either no vegetation or the vegetative cover has been reduced. Erosion is common within coastal dune systems and can occur as part of natural processes as well as human factors such as uncontrolled pedestrian and/or vehicle access. Current management includes monthly inspections by the City within the coastal foreshore reserve to identify any issues and assign rehabilitation priorities.

Rehabilitation of erosion affected areas may include revegetation, use of sand trap fencing, application of stabilisation material such as biodegradable matting or mulch, use of signage and establishing barriers to deter people (and their pets) from accessing sensitive areas.

5.2.3 NPO Rehabilitation strategy

The following section outlines the rehabilitation strategy for the NPO rehabilitation area. A detailed Rehabilitation Plan will be prepared following environmental and planning approval of the Proposal and submitted to the Responsible Authority for approval.

Rehabilitation will target Degraded to Good vegetation in the area mapped by Mattiske (2013) outside of the Proposal area (Figure 2). Approximately 5 ha will be chosen for rehabilitation within this area following detailed site assessment and rehabilitation planning to maximise the ecological benefit to the area and likelihood of rehabilitation success.

Prior to rehabilitation works being undertaken, an up to date baseline survey will be undertaken in spring of potential rehabilitation sites and vegetation mapped by Mattiske (2013) as Very Good and Excellent condition. The results of the survey will determine parameters such as native plant species density, richness and percentage canopy cover in Very Good condition vegetation to inform NPO rehabilitation area completion criteria. Results from Excellent vegetation condition areas will provide a more complete species list and understanding of vegetation structure to inform rehabilitation works.

Rehabilitation objectives

Broad objectives, targets and key performance indicators have been developed for rehabilitation of the NPO rehabilitation area and are provided in Table 5. Preliminary completion criteria have also been developed but will be further defined by the baseline survey to be undertaken prior to rehabilitation (Table 6). Rehabilitation success will be monitored against these criteria annually for five years, or until completion criteria are met.

Table 5: Targets, objectives and indicators for rehabilitation of NPO rehabilitation area

Management objective	Targets	Performance indicators
Improve vegetation condition in 5 ha of the NPO rehabilitation area in Degraded to Good condition to Very Good condition	Completion criteria outlined in Table 6.	Monitoring data and photo points
Prevent damage to native vegetation and revegetation within rehabilitation areas through unauthorised use and access	No significant damage to existing vegetation or revegetation caused by unauthorised human use/access.	Monitoring and visual observations
Prevent the introduction and spread of weeds	Completion criteria outlined in Table 6.	Monitoring
Prevent the introduction and spread of plant pathogens	No introduction of plant pathogens.	Monitoring and visual observations
Prevent damage from feral animals	No significant damage to rehabilitation from feral animals.	Monitoring and visual observations
Prevent fire incidents	No unauthorised fires.	Absence of fire
Prevent soil erosion	Stable soil surface.	Monitoring

Table 6: Completion criteria for NPO rehabilitation area

Criteria	Indicator	Completion criteria
Weeds	% cover of weed species	Compliance shall be achieved when percentage weed cover is no greater than percentage weed cover of Very Good vegetation within relevant baseline/control survey quadrats.
Native plant density	Number of native plants per m ²	Compliance shall be achieved when native plant density equals, or is similar to, the native plant density of Very Good vegetation within relevant baseline/control survey quadrats.
Native species richness	Number of species recorded	Compliance shall be achieved when native plant richness reaches, or is similar to, that of Very Good vegetation within relevant baseline/control survey quadrats.

Rehabilitation actions

Rehabilitation will be undertaken through implementation of the actions described in Table 7 in order to meet targets described in Table 5 and completion criteria in Table 6. Management actions proposed to be undertaken to achieve management objectives are listed in Table 7.

The baseline survey, seed collection and initial weed control (Table 7) will be undertaken prior to the proposed clearing. The rest of the rehabilitation work will commence in the same calendar year as the clearing; to enable site preparation and revegetation work to be undertaken at the appropriate time of year regardless of the specific clearing date.

Table 7: Management actions for rehabilitation areas

Parameter	Action	Timing
Baseline survey of rehabilitation sites	Record data in each vegetation type to be rehabilitated, to inform monitoring against completion criteria. Data to be recorded should include: <ul style="list-style-type: none"> • density of native flora species • native flora species richness • native vegetation percentage foliage cover • weed species percentage foliage cover • plant health (i.e. evidence of water stress, pests, animal grazing). 	Spring months prior to revegetation
Baseline survey of remnant Very Good to Excellent vegetation in control sites (to establish species lists and completion criteria)	Record data within control sites in each vegetation type relevant to the area to be rehabilitated, to inform monitoring against completion criteria. Data to be recorded should include: <ul style="list-style-type: none"> • density of native flora species • native flora species richness • native vegetation percentage foliage cover • weed species percentage foliage cover • plant health (i.e. evidence of water stress, pests, animal grazing) • photo points. 	Spring months prior to revegetation and the subsequent spring (two spring monitoring events)
Weeds	Spot spray weed control prior to revegetation works.	Spring and autumn months
	Follow-up weed control (spot spray).	Twice annually for three years, in spring and autumn months
	Weed control methods to be acceptable to relevant City and Parks and Wildlife standards.	During weed control
	Control methods for any weeds listed as Declared Plants to be undertaken in accordance with guidelines of the Department of Agriculture and Food.	During weed control
Feral animals	Conduct rabbit control (warren destruction, baiting, virus release) in rehabilitation areas.	Prior to revegetation
	Follow-up rabbit control.	Annually for three years
	Investigate potential management control for cats and foxes within the rehabilitation areas and implement if practicable.	Prior to revegetation
Seed collection	Compile list of appropriate species to be planted in revegetation areas based on the baseline survey and previous flora and vegetation surveys of the Proposal area and surrounds.	Prior to seed collection
	Prior to clearing for the Proposal, collect seed from areas to be cleared of any suitable species for use in the rehabilitation area (i.e., species suitable to vegetation types recorded in rehabilitation areas).	September to April prior to clearing of Proposal area
	Prior to clearing for the Proposal, assess the potential for plants to be translocated from areas to be cleared into the rehabilitation area. The assessment should include a risk assessment of the potential for the transfer of plant pathogens and be undertaken in consultation with DPaW. Implement translocation, if appropriate.	Autumn prior to clearing of Proposal area
	If sufficient seed is not available from the Proposal area, additional seed will be collected from BF 325.	September to April
	Appropriate licences to be obtained from Parks and Wildlife for seed collection within any Parks and Wildlife managed land.	Prior to seed collection
Site preparation	Undertake site preparations (e.g. fertiliser tablet installation).	February to March, prior to revegetation
Revegetation	Determine areas suitable for revegetation.	Prior to site preparation
	Propagate seedlings from collected seed.	September – May prior to revegetation works

	Plant seedlings where appropriate to the vegetation type, and/or where rapid results are required (e.g. where heavy weed infestations may out-compete native plants). Broadcast seed of species that are likely to be able to established from seed and/or cannot be propagated.	May – July after site preparation completed, and thereafter as required
	Procure seedlings of local plant species from appropriate, certified dieback-free nurseries if insufficient seedlings are obtained from collected seed.	Prior to revegetation
	Ensure any seedlings brought to site are grown at a dieback-free certified nursery.	Ongoing
Fire	All vehicles entering rehabilitation sites shall be fitted with dry chemical fire extinguishers. All extinguishers shall be tagged by an approved inspector prior to mobilisation.	Ongoing
	Limit vehicles to designated tracks, all vehicles remaining within the site works area and away from vegetation.	Ongoing
	Park all vehicles in designated areas or areas devoid of vegetation.	Ongoing
	Smoking, and cigarette disposal, is not permitted within the rehabilitation areas.	Ongoing
	Report any fire to 000.	Ongoing
Contingency actions	Implement contingency actions to address site environmental issues as per triggers described in Table 9.	Ongoing

Rehabilitation monitoring actions

Monitoring of rehabilitation areas is required to ensure that the objectives outlined in Table 5 are being met and that progress towards and achievement of the completion criteria in Table 6 is monitored. Table 8 details the monitoring actions for the planned rehabilitation. The monitoring program will be undertaken for a minimum of five years but will continue until the completion criteria in Table 6 are achieved or as otherwise agreed with the Responsible Authority.

Table 8: Monitoring actions for NPO rehabilitation areas

Parameter	Frequency and responsibility	Location and sampling setup	Purpose
Revegetation success	Spring annually for five years	Within monitoring quadrats, data to inform the following items will be recorded: <ul style="list-style-type: none"> • density of native flora species • native flora species richness • weed species percentage foliage cover • plant health (i.e. evidence of water stress, pests, animal grazing). 	To monitor establishment of vegetation and compare progress to completion criteria.
Weeds	In spring annually for five years	In addition to monitoring within rehabilitation areas, weed species percentage foliage cover will also be monitored at regular intervals in areas adjacent to the Proposal area.	To monitor threatening processes that could affect rehabilitation success and vegetation condition within remaining areas of BF 325.
Fencing condition	Annually and opportunistically during other works	Observation of fence lines during monitoring.	To ensure that no unauthorised access is occurring within rehabilitation areas.
Feral fauna	Annually and opportunistically	Observation of grazing or predation during monitoring.	To ensure that feral animals are not affecting rehabilitation success.
Waste	Annually and opportunistically	Observation of illegal waste disposal during monitoring.	To ensure that no illegal waste disposal is occurring within rehabilitation areas.

Contingency actions for rehabilitation

Contingency actions will be initiated if monitoring indicates that management actions detailed for NPO rehabilitation areas have not been successful or effective. Table 9 identifies the contingency actions to be initiated in the event that the objectives for rehabilitation areas are not being met. The contingency actions can be triggered at any time during the rehabilitation program following monitoring. Monitoring and contingency actions will continue to be implemented until such time as the completion criteria in Table 6 are met.

Table 9: Contingency actions for rehabilitation areas

Trigger	Action
Increase in distribution, abundance or density/cover of a specific weed species or persistence (within quadrats or in monitoring adjacent to the Proposal area) of weed infestation subsequent to treatment	<ol style="list-style-type: none"> 1. Map the revised extent of the specific weed species within the site. 2. Identify activities that may have potentially increased the abundance, distribution or density/cover of weed species. 3. Review and revise (if required) weed control program (may involve seeking advice from relevant authorities) according to findings from point 2. 4. Implement revised hygiene control and education measures.
New weed species observed within monitoring quadrats or opportunistically within rehabilitation areas	<ol style="list-style-type: none"> 1. Map the distribution of the newly introduced weed species. 2. Identify activities that may have potentially introduced the weed species. 3. Review and revise (if required) weed control program (may involve seeking advice from relevant authorities) to include relevant controls for new species. 4. Implement revised hygiene control and education measures.
Unrestricted or unauthorised access	<ol style="list-style-type: none"> 1. Determine how access was gained and, if possible, the likely time of access. 2. Implement remedy, which could include: <ul style="list-style-type: none"> * repair fence/s * erect signs to highlight private property * install barriers around pedestrian paths. 3. Monitor success of control.
Increase in feral animal activity observed	<ol style="list-style-type: none"> 1. Investigate cause. 2. Review, revise (if required) and implement control program (may involve seeking advice from relevant authorities). 3. Monitor success of remedy.
Fire incident	<ol style="list-style-type: none"> 1. Respond to fire in accordance with relevant Department of Fire and Emergency Services (DFES) and/or the City's fire response procedures. 2. Investigate cause of fire. 3. Implement any remedial actions, if practicable, to prevent future fire incidents, seeking advice of DFES if necessary. 4. Monitor success of remedy.
Waste dumping	<ol style="list-style-type: none"> 1. Remove waste items. 2. Investigate cause. 3. Implement any remedial actions, if practicable, to prevent future waste dumping. 4. Monitor success of remedy.
Insufficient provenance seed volumes or plants collected and propagated from current seed collection areas	<ol style="list-style-type: none"> 1. Discuss with Parks and Wildlife the potential to extend the seed collection areas or obtain additional seed and plants from other seed collectors and native nurseries. 2. Prioritise areas for planting and/or direct seeding, potentially postponing some of the planned works.
Inappropriate species used in rehabilitation areas	<ol style="list-style-type: none"> 1. Identify cause. 2. Remove inappropriate species and replace (if required) with appropriate species. 3. Ensure inappropriate species are not used in future.

Inadequate native flora species richness and/or cover to achieve targets	<ol style="list-style-type: none"> 1. Identify cause. 2. Implement approach to remedy cause, which could include: <ul style="list-style-type: none"> * collecting additional provenance seed for direct seeding or plant propagation to compensate for the insufficient native plant species richness and/or cover * undertake infill seedling planting and direct seeding * application of fertilisers or wetting agents etc, as approved by Parks and Wildlife. 3. Monitor success of remedy.
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Reporting

The Proponent will provide annual reports on the implementation of the rehabilitation, monitoring results, progress towards meeting completion criteria and contingency actions to the Responsible Authority,

5.3 Other mitigation

A Construction Environment Management Plan will be prepared to support subdivision approval and will include vegetation clearing protocols to ensure that potential indirect impacts to adjacent vegetation outside the Proposal area are adequately controlled and managed. These protocols will include:

- the clear demarcation of clearing extent prior to construction to ensure there is no access into areas of BF 325 outside the Proposal area from construction personnel or vehicles
- dust management
- staged clearing
- vehicle hygiene.

In addition, the ORM project will include fencing and formalised access track(s) through BF 325 (using existing cleared areas) to prevent unauthorised access to the retained vegetation. Interpretive signage will also be incorporated to inform people of the environmental and heritage values of the area.

6. Stakeholder consultation

6.1 Community engagement

The Proponent will engage with local community environment groups for planning and implementation of the NPO rehabilitation work within BF 325. The local 'Friends' groups and environmental community groups will be invited to participate in rehabilitation works and opportunistic monitoring, where appropriate.

Community groups work in degraded and good bushland areas with the aim of improving their environmental values. Community groups have access to grant funding when working in partnership with the local land manager to assist with on-ground works through Coastwest and other funding bodies. Community groups are already active within BF 325 and could provide valuable local knowledge and contribution to the management of the NPO rehabilitation area. Relevant community groups in the area include, but are not limited to:

- Friends of North Ocean Reef and Iluka Foreshore
- Friends of Sorrento Beach
- Mullaloo Beach Community Group Inc.

6.2 Agency consultation and agreement of NPO

[HOLD – to be completed. Intention is that agencies will approve the document for public release with the MRS and then the NPO would be finalised and approved following the public comment period.]

7. Environmental outcomes

The Proposal will result in the clearing of 16.79 ha of Degraded to Excellent vegetation within BF 325 in an area which was recognised in Bush Forever (Government of Western Australia 2000) as being a 'Possible Future Strategic Regional Recreation and Tourism Node'.

To mitigate this impact, the City, as Proponent for the ORM, is committed to a NPO that results in an appropriate conservation outcome with consideration of SPP 2.8 and the public advice of the EPA regarding the MRS amendment. The NPO includes the following components:

1. 90% land acquisition: Provision of \$1.6 M of funding to Parks and Wildlife for the acquisition and management of land into the conservation estate. The land acquired will comprise coastal vegetation in similar or better condition and with similar or higher conservation value than the area to be cleared.
2. 10% rehabilitation within BF 325: Rehabilitation of 5 ha of degraded vegetation within BF 325 to at least Very Good condition within five years.

8. Short titles and acronyms

Table 10 Short titles and acronyms

Short title or acronym	Full title
BF 325	Bush Forever Site 325
City	City of Joondalup
DoP	Department of Planning
DPI	Department of Planning and Infrastructure (now DoP)
EP Act	Environmental Protection Act 1986
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
MRS	Metropolitan Region Scheme
NPO	Negotiated Planning Outcome
OEPA	Office of the Environmental Protection Authority
Parks and Wildlife	Department of Parks and Wildlife
Proposal	Ocean Reef Marina Development
SPP 2.8	State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region
WAPC	Western Australian Planning Commission

9. References

- ATA Environmental 2002, *Lot 51 Walding Road, Carabooda: Environmental & Land Capability Assessment*, unpublished report prepared for Broughton Planning, August 2002.
- Department of Planning and Infrastructure (DPI) 2008, *Perth Recreational Boating Facility Study*, Technical Report Number 444.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012, *Referral Guidelines for Three Species of Black-Cockatoos*, Government of Australia, Canberra.
- Government of Western Australia (2000a), *Bush Forever Volume 1 – Policies, Principles and Processes*, Available from <http://www.planning.wa.gov.au/publications/5911.asp>.
- Government of Western Australia (2000b), *Bush Forever Volume 2 – Directory of Bush Forever sites*, Available from <http://www.planning.wa.gov.au/publications/5911.asp>.
- Keighery B 1994, *Bushland plant survey: a guide to plant community survey for the community*, Wildflower Society of Western Australia, Perth, Western Australia.
- Mattiske Consulting Pty Ltd (Mattiske) 2013, *Level 2 Flora and Vegetation Survey of the Proposed Ocean Reef Marina Survey Area*, unpublished report prepared for Strategen, on behalf of City of Joondalup, December 2013.
- Natural Area Consulting 2014 *Coastal Foreshore Management Plan 2014-2024*, report prepared on behalf of the City of Joondalup, March 2014.
- Strategen 2014, Site Inspection – Carnaby's Black-Cockatoo habitat mapping, internal memo dated 18 March 2014.
- Western Australian Planning Commission (WAPC) 2010, *State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region*, Available Government Gazette 2745, WA, 22 June 2010.
- Western Wildlife 2008, *Ocean Reef Marina Redevelopment: Level 1 Fauna Assessment 2008*, report prepared for City of Joondalup.

OCEAN REEF MARINA DEFINITIONS

DEFINITION OF VEGETATION CONDITION¹

Condition Rating	Description
Pristine	Pristine or nearly so, no obvious sign of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by 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, 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 grazing.
Completed 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.

DEFINITION OF PRIORITY FLORA SPECIES – P3²

Priority Three – Poorly Known Species

“Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.”

¹ Government of Western Australia (2000), *Bush Forever Volume 2 – Director of Bush Forever Sites*, available from <http://www.planning.wa.gov.au/publications/5911/asp>.

² Department of Wildlife, cited in: Mattiske Consulting Pty Ltd (2013), *Level 2 Flora and Vegetation Survey of the Proposed Ocean Reef Marina Survey Area*, unpublished report prepared for Strategen Environmental Consultants on behalf of the City of Joondalup.

DEFINITION OF “HIGH CONSERVATION SIGNIFICANCE”

State Planning Policy 2.8 - *Bushland Policy for the Perth Metropolitan Region* uses the terms Very High, High, Medium and Low Conservation Significance and sets the offset criteria and ratios. However, this policy does not provide a definition for these terms and they are not terms that are defined in other related policies.

However, the policy states (Appendix 4) that conservation significance is:

“Based on the environmental attributes of the site on a case-by-case basis, assessing attributes such as vegetation complex type, presence of Threatened Ecological Communities/Declared Rare Flora/priority flora/fauna, conservation category wetlands and condition of vegetation”.

Designating the overall conservation significance of the area of BF 325 to be impacted as “High” has been discussed with the relevant agencies and will be further discussed, and ultimately agreed, during the formal negotiation/agreement phase.