



Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
 - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
 - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.

- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act or another law of the Commonwealth. Information is available on the Department's web site.

Is your action in the Great Barrier Reef Marine Park?

If your action is in the Great Barrier Reef Marine Park it may require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If a permission is required, referral of the action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the Great Barrier Reef Marine Park Regulations 1983. If a permission is not required under the GBRMP Act, no approval under the EPBC Act is required (see section 43, EPBC Act). The Authority can provide advice on relevant permission requirements applying to activities in the Marine Park.

The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Further information on environmental approval requirements applying to actions in the Great Barrier Reef Marine Park is available from <http://www.gbrmpa.gov.au/> or by contacting GBRMPA's Environmental Assessment and Management Section on (07) 4750 0700.

The Authority may require a permit application assessment fee to be paid in relation to the assessment of applications for permissions required under the GBRMP Act, even if the permission is made as a referral under the EPBC Act. Further information on this is available from the Authority:

Great Barrier Reef Marine Park Authority

2-68 Flinders Street PO Box 1379

Townsville QLD 4810

AUSTRALIA

Phone: + 61 7 4750 0700

Fax: + 61 7 4772 6093

www.gbrmpa.gov.au

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The action can proceed if undertaken in a particular manner (subject to any other Commonwealth, state or local government requirements). The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes. If your project is in the Great Barrier Reef Marine Park and a decision is made to approve it, the Authority may also audit it. (See "*Is your action in the Great Barrier Reef Marine Park*," p.2, for more details).

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Mangles Bay Marina Based Tourist Precinct

1 Summary of proposed action

1.1 Short description

The proposed action is for a marina based tourist development comprising a single-entry marina to accommodate up to 500 pens and moorings and a surrounding land development comprising tourism, short term accommodation, commercial, public open space and residential land uses. The proposed action includes the marina, a boating access channel and land development. The action will also include rehabilitation of degraded areas of surrounding vegetation and seagrass transplantation to offset vegetation losses.

1.2 Latitude and longitude

Location Point	Latitude	Longitude
1	-32.26902	115.69718
3	-32.27149	115.69600
2	-32.27073	115.69683
4	-32.27170	115.69652
5	-32.27313	115.69512
6	-32.27360	115.69704
7	-32.27188	115.69762
8	-32.27109	115.69840
9	-32.27095	115.69763
10	-32.26968	115.69857
11	-32.26911	115.69801
12	-32.27255	115.69844
13	-32.27259	115.69878
14	-32.27342	115.69927
15	-32.27542	115.70482
16	-32.27433	115.70621
17	-32.26899	115.70619
18	-32.26904	115.70661
19	-32.27366	115.70649
20	-32.27562	115.70795
21	-32.27538	115.70956
22	-32.27650	115.70965
23	-32.27650	115.71091
24	-32.28264	115.71066
25	-32.27446	115.69843
26	-32.27385	115.69847
27	-32.27371	115.69803

Note: Appendix 7 includes location points of proposed action footprint.

1.3 Locality and property description

The Mangles Bay Marina Tourist Precinct is located within the Perth Metropolitan Area, on the Swan Coastal Plain approximately 40 km south-south-west of Perth within the City of Rockingham, Western Australia.

- 1.4 **Size of the development footprint or work area (hectares)** The total proposed development area is 77 ha comprising the following:
- Marina area (12 ha)
 - Land development area (46 ha)
 - Access channel, breakwaters and reclamation (6 ha)
 - Undeveloped land (13 ha)
-
- 1.5 **Street address of the site** The site has no specific street address.
The proposed development area is predominantly east of the Garden Island Causeway and is bounded by Hymus Street/Safety Bay Road to the east.
-

1.6 **Lot description**

The Proposal area is in the ownership of the State Government as a mix of Crown Land and Freehold. Freehold areas are owned by the Departments of Regional Development and Lands, Transport and Water Corporation. Currently, the area to the south of Point Peron Road is zoned as 'Parks and Recreation' and the area to the north of Point Peron Road, along Mangles Bay foreshore, is reserved 'Port Installations' under the Perth Metropolitan Region Scheme.

Lot No.	Certificate of Title		owner	Responsible Agency	Landuse
	Volume	Folio			
2056	3050	970	Crown		Recreation
500	3050	970	Crown	Department of Environment and Conservation	Recreation
501	3050	970	Crown	WA Sport Centre Trust	Recreation
2058	3050	970	Crown	WA Sport Centre Trust	Recreation
2055			Crown	Department of Regional Development and Lands	Parking
3	431	35A	Minister for Transport	Freehold	Cruising Yacht Club WA
303			Crown	Minister for Sport and Recreation	-
5	1325	694	Water Corporation freehold	Water Corporation	-
2	1273	533	Minister for Transport	Freehold	Mangles Bay Fishing Club Inc
1	15	226A	Minister for Transport	Freehold	Mangles Bay Fishing Club Inc
2301	3144	604	Crown	Marine and Harbours Department	Harbour
2328	3144	605	Crown	Marine and Harbours Department	Harbour
3055	3029	460	Crown	Department of Planning and Infrastructure	Access control
2804	3054	289	Crown	Department of Planning and Infrastructure	Rockingham Volunteer Sea Rescue/Parking/Recreation
2733	3121	544	Crown	Water Corporation	Sewage
2193	3086	723	Crown	Water Corporation	Drainage
2734	3121	545	Crown	Water Corporation	Sewage

1.7 **Local Government Area and Council contact (if known)**

Peter Ricci
 Manager Strategic Planning and Environment
 City of Rockingham
 Phone: (08) 9528 0333
 Fax: (08) 9592 1705
 Email: council@rockingham.wa.gov.au

1.8 **Time frame**

Construction for the proposed action will commence once planning and environmental approvals are obtained. It is expected that the development will be staged with the construction of the marina commencing in early 2013.

1.9	Alternatives to proposed action Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?	<input type="checkbox"/>	No
		<input checked="" type="checkbox"/>	Yes, you must also complete section 2.2
1.10	Alternative time frames etc Does the proposed action include alternative time frames, locations or activities?	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.12	State assessment Is the action subject to a state or territory environmental impact assessment?	<input type="checkbox"/>	No
		<input checked="" type="checkbox"/>	Yes, you must also complete Section 2.4
1.12	Component of larger action Is the proposed action a component of a larger action?	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 2.6
1.13	Related actions/proposals Is the proposed action related to other actions or proposals in the region (if known)?	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, provide details:
1.14	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, provide details:
1.15	Great Barrier Reef Marine Park Is the proposed action inside the Great Barrier Reef Marine Park?	<input checked="" type="checkbox"/>	No
		<input type="checkbox"/>	Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

2.1 Description of proposed action

History of proposed action

Due to the steadily increasing demand for boating facilities, the redevelopment of the Mangles Bay area (Figure 1) has been the subject of a number of previous proposals since the 1970s that have included both a sea-based marina and a land-based marina.

In 2005 a marina concept plan for the site was prepared following a comprehensive community consultation process. A 'Strategic Environmental Review' of the concept plan was undertaken by the EPA in 2006 in accordance with section 16(e) of the *Environmental Protection Act 1986* (EP Act). The purpose of this process was to identify key environmental issues associated with the project and to gather, at a strategic level, information on those environmental issues.

The Strategic Environmental Review was released for public comment on 7 March 2006 for a four week period and received approximately 440 submissions. Following the public comment and EPA review period, the EPA provided advice in October 2006 as Bulletin 1237. The EPA recommended that the following key environmental factors should be evaluated in detail for any future proposal:

- seagrass and water quality
- Lake Richmond
- terrestrial vegetation.

Other factors also to be considered included:

- geoheritage, including impacts on Cape Peron's significant geoheritage features
- terrestrial fauna
- marine fauna
- coastal processes
- natural value/wilderness value of Mangles Bay.

Description of proposed action

The proposed action is a marina based tourist development comprising a single-entry marina to accommodate up to 500 pens and moorings and a surrounding land development comprising tourism, accommodation, commercial, public open space and residential land uses. The project will provide much needed protected boating facilities in Mangles Bay, enhance public access to Mangles Bay and create a vibrant tourist district that will attract visitors to the region and create employment opportunities for Rockingham and the surrounding area. The project will also include rehabilitation of the wider Cape Peron bushland and provide additional passive recreation facilities such as walkways and information. The Project design objectives are included in Appendix 1. The development will also incorporate local aquatic clubs.

The proposed action consists of the following elements:

- marina
- access channel
- provision and maintenance of service infrastructure
- land development area.

Figure 2 outlines the area of the proposed action and the indicative area the marina will occur within, the access channel, breakwaters and land development boundary. The exact layout of the proposed action, especially of the marina, channel and breakwaters, is still subject to amendment on the basis of stakeholder consultation and environmental and engineering investigations.

Land development area

The total land development area is estimated to be up to 46 ha.

The land development area will encompass various land uses including:

- tourist-based commercial uses
- short-term accommodation
- commercial
- residential.

The distribution and density of residential land uses will be defined during the structure planning process of the proposed action. The development will, however, comprise a variety of lot sizes and residential densities to provide a diverse mix of buildings.

It is intended that the marina will provide a focal point for the local community and a tourist destination. The Cedar Woods and LandCorp (joint partner in the development) vision is to provide the community with a gathering place from which locals and tourists will embark to explore Cape Peron and its surrounds.

Memorial Drive, a local access road within the project area that connects to Safety Bay Road will be realigned as part of the development.

Marina

The total water area of the single entrance marina is estimated to be up to 12 ha and will be designed within the larger area indicated in Figure 2. The marina will be able to accommodate pens for up to 500 craft, ranging from 8 m to 25 m in length. The east and western sides of the marina are likely to be connected via a pedestrian bridge, to allow for continuous east-west public access within the land development and the foreshore areas. The pedestrian bridge will limit marina access to yachts due to mast heights. Accordingly, the proposed action is likely to include an inner and outer marina so both power boats and sail craft can be adequately accommodated.

The marina will be constructed using dry excavation methods. The first stages of construction will involve the creation of a bund (in the location of the future marina entrance) then progressive dewatering of the area to allow for dry excavation.

The precise layout of the marina will be finalised following hydrodynamic modelling to be undertaken for the proposed action.

Access channel

The proposed action includes a dredged access channel to allow large (up to 25 m) power and sail craft to access the marina. The channel will extend approximately 550 m north from the breakwaters at the entry of the marina, towards deeper waters in Cockburn Sound. The channel will be within Mangles Bay east of the Garden Island Causeway. The breakwater and channel will be subject to further detailed design to minimise the area disturbed. The channel will be dredged using a 'cutter suction dredge', with dredged material piped back to the mainland. The dredged material will be placed in settlement and infiltration basins located within the project area adjacent to the coast, where the seawater will infiltrate into the shallow groundwater system (which discharges to Mangles Bay) and solid material will be treated and disposed off site, where necessary. The channel and breakwater will be subject to further detailed design to minimise the disturbed area.

Key infrastructure

A Water Corporation easement is currently located within the proposed action area (Figure 3). It is understood that the Water Corporation proposes to upgrade and duplicate the infrastructure within this easement in the future. As part of this proposed action, Cedar Woods, through an agreement with Water Corporation, is proposing to relocate the infrastructure easement from its current location to an alignment that will run parallel to the southern boundary of the proposed action within the proposed realigned Memorial Drive road reserve.

An ocean outfall pipe carrying stormwater overflow from Lake Richmond to Mangles Bay (near the Mangles Bay Fishing Club jetty) is located within the proposed action area (Figure 3). The proposed action includes the relocation of this ocean outfall pipe to the end of Hymus Street with the pipeline infrastructure to be contained within the Safety Bay Road /Hymus Street road reserve.

Other elements of this proposed action

Other elements of this proposed action include:

- road improvements to cater for additional traffic
- improved beach access to the public
- remediation and enhancement works outside the proposed action including revegetation of degraded areas around Cape Peron, dune restoration, seagrass transplantation and improved passive recreation facilities (e.g. walkways and signage)
- construction of a dual use path along the length of the beachfront to the causeway
- affordable family holiday accommodation with beachfront access
- a site for the Boating Clubs, on a non-commercial leasehold basis, with marina frontage and beach access
- a seabed lease within the marina and adjoining the boating clubs land site in which the clubs can build pens and lease them to members
- commercial pens to be provided in the public tourist area for commercial charter operators
- a tourism hub including restaurants, cafes and short-term serviced accommodation
- a site for a Marine Science Centre.

2.2 Alternatives to taking the proposed action

The project's primary aim is to meet the high demand for boating facilities in the Rockingham area. Cockburn Sound is an important destination for boating, providing a large area of protected water for yachting and powerboat use. Rockingham is one of the fastest growing population centres in the south-west corridor. As a result, boat ownership and the demand for boating facilities are also rapidly increasing in the area.

Currently, boats larger than trailerable size are confined to moorings in Mangles Bay, which provide little protection to vessels from winter storms which approach from the north-west. The existing swing moorings in Mangles Bay have also removed seagrass in mooring scars visible in Figure 3.

In 2005, a review of the costs, benefits and constraints of Mangles Bay and other potential sites along the City of Rockingham coastline was undertaken. The review concluded that for a marina-based development, when assessed against the project sustainability objectives, Mangles Bay presented the least constraints and most opportunities when compared with the other sections of the coastline in the City of Rockingham.

Alternative design concepts have been considered in consultation with the community during the 2005 and 2006 process and the development of the current proposed action. All options involved an inland marina, however each differed with respect to layout and the extent of land footprint. An offshore marina option in Mangles Bay was not considered likely to provide the project benefits of a mixed use tourism precinct, would involve the loss of a substantial proportion of seagrass in Mangles Bay and would not be likely to be found environmentally acceptable even with rehabilitation of seagrass.

The details of the 2005/6 process and community and stakeholder involvement in developing the concept and project objectives are provided in Appendix 4 as part of the Strategic Environmental Review.

The proposed action presented within this referral document has been developed taking into account previous community and regulatory agency consultation and the Environmental Protection Authority of Western Australia's advice provided within Bulletin 1237 in October 2006. The configuration of the marina and breakwaters is still subject to detailed design and will be refined based on ongoing hydrogeological and hydrodynamic investigations and modelling being undertaken for the development.

2.3 Alternative locations, time frames or activities that form part of the referred action

The proposed action does not include any alternative locations, timeframes or activities.

2.4 Context, planning framework and state/local government requirements

Rockingham has been identified by the State Government as a new Primary Centre in the Perth and Peel regions for the next 20 years in the new draft planning framework 'Directions 2031'. The State Government is committed

to investigating potential for the Mangles Bay Marina Based Tourist Precinct to provide additional boating and tourist facilities in the Rockingham area.

The proposed action will be subject to a local and state government planning approvals process. At a local government level, approval from the City of Rockingham will be required to progress planning scheme amendments for the site and for the construction of the land and the marina area through subdivision and development approvals. At a state government level, a Metropolitan Region Scheme Amendment and Town Planning Scheme Amendment will be required under the *Planning and Development Act 2005* to rezone the various areas for development.

It is important to note that the Western Australian Environmental Approvals Process under Part IV of the *Environmental Protection Act 1986*, will be conducted prior to seeking planning approval at both the state and local government levels.

The proposed marina development is subject to the approval of the legislation outlined in Table 1.

Table 1 State and local legislation in Western Australia applicable to the proposed action

Title	General description
<i>Conservation and Land Management Act 1984</i>	Provisions for the use, protection and management of certain public lands and waters and the flora and fauna thereof.
<i>Environmental Protection Act 1986 (EP Act)</i>	Creation of the Environmental Protection Authority (EPA), for the prevention, control and abatement of environmental pollution, for the conservation, preservation, protection, enhancement and management of the environment.
<i>Local Government Act 1995</i>	Provides for a system of local government.
<i>Main Roads Act 1930</i>	Requirements related to the construction of roads.
<i>Occupational Safety and Health Act 1984</i>	Provisions for occupational health and safety standards.
<i>Rights in Water and Irrigation Act 1914</i>	Relates to the regulation, management, use and protection of water resources.
<i>Soils and Land Conservation Act 1945</i>	Relates to the conservation of soil and land resources, and to mitigate the effects of erosion, salinity and flooding.
<i>Planning and Development Act 2005</i>	Related to rezoning of land and changes to the Metropolitan Region Scheme.
<i>Waterways Conservation Act 1976</i>	The conservation and management of designated water and of the associated land and environment.
<i>Wildlife Conservation Act 1950</i>	Provision for the conservation and protection of wildlife.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

Cedar Woods and LandCorp are joint partners for the Mangles Bay Marina Based Tourist Proposal. The project was referred to the Office of the Environmental Protection Authority of Western Australia on 10 August 2010, under Part IV of the *Environmental Protection Act 1986* (EP Act).

The development is expected to be assessed at the level of Public Environmental Review (PER) level of assessment under the EP Act.

2.6 Public consultation (including with Indigenous stakeholders)

Consultation history

Extensive consultation regarding this concept was undertaken in 2005 and 2006. The process focussed on an active community engagement approach for development of marina based tourism precincts at the Mangles Bay site. A high level of interest was shown in this concept with more than 800 community members from a broad range of stakeholder groups participating in the process. The consultation process included public forums, establishment of a Stakeholder Reference Group, public advertising, project website, information hotline and various individual stakeholder meetings including Aboriginal representatives.

Key agencies, NGOs and other stakeholder groups consulted included:

- Royal Australian Navy and Corporate Support Infrastructure Group
- Environmental Protection Authority Services Unit
- Department of Environment
- Department of Conservation and Land Management
- Cockburn Sound Management Council
- Department for Planning and Infrastructure and the WA Planning Commission
- Public Transport Authority
- Main Roads WA
- Water Corporation
- City of Rockingham
- Naragebup Rockingham Regional Environment Centre
- Recreation camp lessees (e.g. RSL, Apex)
- Mangles Bay foreshore user groups (e.g. Mangles Bay Fishing Club, Cruising Yacht Club of WA)
- Aboriginal groups
- Local residents and interest groups
- Local business operators
- Local sport and recreation groups
- Boat owners and mooring owners
- Recreational beach users.

Current consultation

Discussions with the City of Rockingham have been conducted together with key government agencies including the Office of the Environmental Protection Authority and the Department of Planning. The proponent has also met with the local fishing and boating clubs on several occasions and will continue to meet with other stakeholders throughout the environmental approval and planning approval processes.

The environmental assessment process under the EP Act will involve further public and stakeholder consultation.

2.7 A staged development or component of a larger project

The proposed action may be undertaken in stages depending on prevailing market conditions. The core marina component will be constructed as part of Stage 1 with subsequent progressive subdivision of the land component.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

There are no World Heritage Properties within the vicinity of the proposed action.

Nature and extent of likely impact

The proposed action will not affect any World Heritage Properties.

3.1 (b) National Heritage Places

Description

There are no National Heritage Places in the vicinity of the proposed action.

Nature and extent of likely impact

The proposed action will not affect any National Heritage Places.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The Protected Matters Search tool returned results for three wetland systems which include the:

- Becher Point Wetlands (approximately 7 km east of the Project area)
- Forrestdale and Thomsons Lakes (approximately 10 km north-east of Project area)
- Peel-Yalgorup System (approximately 18 km south of Project area).

As these wetland systems are located well outside the project area and the project is at the bottom of its catchment (i.e. adjacent to the coast), the wetland systems will not be impacted by the proposed action and therefore are not considered further in this referral.

Nature and extent of likely impact

The proposed action will not affect any wetlands of international importance.

3.1 (d) Listed threatened species and ecological communities

Description

A search using the Protected Matters Database search tool was undertaken on the 16 August 2010 (Appendix 5). The search returned a number of threatened ecological communities and birds, mammals, reptiles, sharks, marine and migratory species. These matters are outlined in Table 2 together with their location in respect to the proposed action and likelihood of their occurring within the proposed action footprint.

Due to the nature of the proposed action with marine impacts limited to the shallow waters of Mangles Bay, impacts to the following conservation significant species are considered to be unlikely (summarised in Table 2):

- marine mammals are unlikely to utilise the shallow waters of Mangles Bay
- marine reptiles are unlikely to occur regularly within Cockburn Sound.

The assessment of likelihood of occurrence is based on information provided in Appendix 3 (ENV 2010b).

Table 2 Matters of National Environmental Significance identified by Protected Matters search tool

Matters of National Environmental Significance	Species identified with Protected Matters Search tool	Status	Likelihood to occur within proposed action footprint (ENV 2010b)
Threatened Ecological Communities	Sedgeland in Holocene dune swales of the southern Swan Coastal Plain	Endangered	Expected to occur approximately 200 m, from proposed action footprint.
	Thrombolite (microbial) community of coastal freshwater lakes of the Swan Coastal Plain (Lake Richmond)	Endangered	Not within proposed action footprint, but approximately 200 m from proposed action footprint and 400 m from the marina.
Birds	Forest Red-tailed Black Cockatoo	Vulnerable	Unlikely to occur due to lack of habitat within the proposed action footprint.
	Carnaby's Cockatoo, short-billed Black-Cockatoo	Endangered	Unlikely to occur due to lack of habitat
	Gibsons Albatross	Vulnerable	Unlikely to occur due to lack of habitat
	South Giant-Petrel	Endangered	Unlikely to occur due to lack of habitat
	Northern Giant-Petrel	Vulnerable	Unlikely to occur due to lack of habitat
	Shy Albatross, Tasmanian Shy Albatross	Vulnerable	Unlikely to occur due to lack of habitat
Insects	Graceful Sun-moth	Endangered	Occurs within proposed action footprint, however, regional population is unlikely to be impacted
Mammals	Blue Whale	Endangered	Unlikely to occur, due to nature of proposed action
	Chuditch, Western Quoll	Vulnerable	Unlikely to occur, due to lack of appropriate habitat
	Southern Right Whale	Endangered	Unlikely to occur, due to nature of proposed action
	Humpback Whale	Vulnerable	Unlikely to occur, due to nature of proposed action
	Australian Sea-lion	Endangered	Unlikely to occur, due to nature of proposed action
	Red-tailed Phascogale	Endangered	Unlikely to occur due to lack of habitat
	Quokka	Vulnerable	Unlikely to occur due to lack of habitat
Reptiles	Loggerhead Turtle	Endangered	Unlikely to occur, due to nature of proposed action

	Green Turtle	Vulnerable	Unlikely to occur, due to nature of proposed action
	Leatherback Turtle, Leathery Turtle, Luth	Endangered	Unlikely to occur, due to nature of proposed action
Sharks	Grey Nurse Shark (west coast population)	Vulnerable (migratory)	Unlikely to occur, due to nature of proposed action
	Grey White Shark	Vulnerable (migratory)	Unlikely to occur, due to nature of proposed action
	Whale Shark	Vulnerable (migratory)	Unlikely to occur, due to nature of proposed action
Plants	<i>Centrolepis caespitosa</i>	Endangered	Unlikely to occur, as targeted searches for conservation significant species (ENV 2010) did not return results for this species
Migratory terrestrial species	White-bellied Sea-Eagle	Migratory	See Section 3.1(e) for further details
	Rainbow Bee-eater	Migratory	See Section 3.1(e) for further details
Migratory wetland species	Great Egret, White Egret	Migratory (and marine)	See Section 3.1(e) for further details
	Cattle Egret	Migratory (and marine)	See Section 3.1(e) for further details
Migratory Marine Birds	Fork-tailed Swift	Migratory	See Section 3.1(e) for further details
Migratory Marine Species – mammals	Bryde's Whale	Migratory	Unlikely to occur, due to nature of proposed action
	Blue Whale	Migratory	Unlikely to occur, due to nature of proposed action
	Pygmy Right Whale	Migratory	Unlikely to occur, due to nature of proposed action
	Southern Right Whale	Migratory	Unlikely to occur, due to nature of proposed action
	Dusky Dolphin	Migratory	Unlikely to occur, due to nature of proposed action
	Humpback Whale	Migratory	Unlikely to occur, due to nature of proposed action
	Killer Whale, Orca	Migratory	Unlikely to occur, due to nature of proposed action
Mammals	New Zealand Fur-seal	Listed	Unlikely to occur within proposed action footprint, most likely to occur on offshore Garden Island approximately 3.5 km from proposed action

	Australian Sea-lion	Listed	Unlikely to occur within proposed action footprint, known to occur on offshore Garden Island approximately 3.5 km from proposed action
Ray-finned fishes	Southern Pygmy Pipehorse	Listed	Unlikely to occur within Mangles Bay however is most likely to occur within Shoalwater Islands Marine Park, on the southern side of Point Peron. Unlikely to be impacted from proposed action.
	Gale's Pipefish	Listed	
	Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish	Listed	
	Western Spiny Seahorse, Narrow-bellied Seahorse	Listed	
	Short-head Seahorse, Short-snouted Seahorse	Listed	
	West Australian Seahorse	Listed	
	Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish	Listed	
	Australian Smooth Pipefish, Smooth Pipefish	Listed	
	Prophet's Pipefish	Listed	
	Javelin Pipefish	Listed	
	Sawtooth Pipefish	Listed	
	Western Crested Pipefish	Listed	
	Bonyhead Pipefish, Bony-headed Pipefish	Listed	
	Leafy Seadragon	Listed	
	Common Seadragon, Weedy Seadragon	Listed	
	Pugnose Pipefish, Pug-nosed Pipefish	Listed	
	Gunther's Pipehorse, Indonesian Pipefish	Listed	
	Spotted Pipefish, Gulf Pipefish	Listed	
	Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish	Listed	
	Hairy Pipefish	Listed	
Mother-of-pearl Pipefish	Listed		
Port Phillip Pipefish	Listed		
Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish	Listed		
Reptiles	Spectacled Seasnake	Listed	Unknown. May occur within Shoalwater Islands Marine Park, southern side of Point Peron
Whales and other cetaceans	Minke Whale	Listed	Unlikely to be impacted due to the nature of the proposed action
	Bryde's Whale	Cetacean	
	Blue Whale	Cetacean	
	Pygmy Right Whale	Cetacean	

	Common Dolphin, Short-beaked Common Dolphin	Cetacean	
	Southern Right Whale	Cetacean	
	Risso's Dolphin, Grampus	Cetacean	
	Dusky Dolphin	Cetacean	
	Spotted Dolphin, Pantropical Spotted Dolphin	Cetacean	
	Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin	Cetacean	
	Bottlenose Dolphin	Cetacean	

Carnaby's Cockatoo, short-billed Black-Cockatoo/ Forest Red-tailed Black Cockatoo

The EPBC protected matters database search returned the potential for these species to occur within the proposed action footprint. Investigations undertaken by ENV (2010b) did not record evidence of these species in the survey area and indicated a lack of potential habitat within the proposed action footprint. The proposed action footprint does not contain foraging species such as Banksia, Marri or Jarrah trees and no suitable hollows were identified within trees within the area. Due to the lack of habitat available for these species, potential impacts from the proposed action are not considered further in this referral.

Sedgeland in Holocene dune swales of the southern Swan Coastal Plain

The threatened ecological community Sedgeland in Holocene dune swales, is located east of Safety Bay Road in linear damplands, and occasionally sumplands, between Holocene dunes. Specifically, this community is associated with Lake Richmond and is >200 m from the proposed action footprint (Figure 3). This communities' present distribution on the Swan Coastal Plain is almost entirely located within swales (linear wetland depression) occurring between parallel sand ridges of the Rockingham-Beecher Plain.

This vegetation composition of this community is likely to be related to both age and proximity to the watertable (English et. al. 2002). The sedgeland community at Lake Richmond is typically dense, species-poor sedgeland dominated by *Baumea juncea* and *Isolepis nodosa* (English et. al. 2002). The vegetation community present at Lake Richmond is also known to occur adjacent to water bodies of Lake Walyungup (approximately 6 km east from Lake Richmond) and Lake Cooloongup (approximately 8 km south east from Lake Richmond).

Lake Richmond Thrombolites

Lake Richmond supports a unique thrombolite (microbial) community which is listed as an endangered, threatened ecological community under the EPBC Act. Lake Richmond is located south-east of the proposed footprint approximately 400 m from the marina .

The Thrombolite community on Lake Richmond occurs on relic foredune plain on Holocene sands at Lake Richmond (DEWHA 2010). Thrombolites are microbial structures, which represent one of the oldest living organisms on earth. The thrombolite community consists of a complex association of photosynthetic cyanobacteria and purple sulphur bacteria, eukaryotic microalgae and true bacteria (DEWHA 2010). The thrombolites occur in a zone about 15 m wide around much of the lake, with the best developed formations occurring on the eastern side of the lake (DEWHA 2010).

Lake Richmond is a unique lake system on the Swan Coastal Plain as it is deep (maximum depth 15 m), perennial and fresh. The lake was isolated from the sea when part of the marine portion of Cockburn Sound filled in during the last 4000 years (Kenneally et al 1987). This separated the lake from the sea by beach ridges (Kenneally et al. 1987).

The thrombolites are unlike the thrombolites on Lake Clifton (approximately 65 km south of Lake Richmond on the coastal plain) (DEWHA 2010) which are predominantly supported by saline groundwater and surface water. The assemblage at Lake Richmond appears to be adapted to fresh water, and would be unlikely to survive major increases in salinity (DEWHA 2010).

Graceful Sun Moth

A Graceful Sun Moth survey was undertaken of the Mangles Bay area in accordance with the Department of Environment and Conservation's survey criteria for Graceful Sun Moths (ENV 2010c included in Appendix 4). A total of three moths were recorded in the survey area, one within the eastern portion of the proposed action footprint and the other two in the adjoining bushland directly to the south but outside of the footprint (Figure 3, Appendix 4).

Graceful Sun Moth (GSM) transect surveys were conducted on 6, 11, 16 and 25 of March 2010. A *Lomandra maritima* (GSM habitat) survey was conducted on the 10 March and 8 April. The survey undertaken for the GSM transects met Department of Environment and Conservation guidelines for GSM (Bishop et al. 2009). The GSM survey and report is included in Appendix 4. The GSM survey recorded one species within, and two individual species outside the proposed action footprint (Figure 3). GSM habitat was also identified both within and outside of the proposed action footprint. Additional *Lomandra maritima* habitat survey will be undertaken to define the extent of GSM habitat within and outside the proposed action footprint.

Nature and extent of likely impact

Lake Richmond Thrombolites (endangered TEC)

The proposed action boundary is approximately 200 m from Lake Richmond and there will be no direct impact on the lake as a result of the action. The potential indirect impacts are hydrological changes as a result of the inland marina that could affect groundwater quality and therefore the quality of groundwater discharge into the lake. The construction of the inland marina will result in the alteration of the salt water interface (with groundwater) and potentially bring this closer to Lake Richmond.

Any change in water quality could potentially have an impact on the thrombolite community although it is likely they are supported by freshwater inflows from stormwater which will be unaffected by the proposed action. As the indicative marina water-body will be at least 400 m north west of the lake and the groundwater flow is towards the coast (west and north), it is highly unlikely that any groundwater changes below the marina will affect water quality in Lake Richmond. However, extensive groundwater investigations and modelling are being undertaken to investigate this potential. Any significant impact on the hydrology of Lake Richmond would be considered unacceptable by the proponent. Therefore, if investigations indicate a significant impact is likely, the action would be modified to avoid this impact.

Preliminary baseline monitoring of the lake and groundwater systems undertaken over the last six months (and to continue over the next six months) has indicated that Lake Richmond represents a simple through-flow system characterised by a top fresh water layer (approximately 5-10 m) which is sustained by stormwater runoff drains and rainfall and a lower, highly saline bottom layer of the lake. Groundwater flow within the proposed action area is in a north-westerly direction, discharging towards the coast into Mangles Bay.

A detailed review of the bore logs of 14 bores drilled within the proposed location of the marina and the results of groundwater and surface water baseline monitoring data collection has provided a preliminary indication that the proposed action will have no direct or indirect impacts on Lake Richmond and the hydrological and hydrogeological systems that support it.

Other indirect impacts to the thrombolite community include increase in pressure from human population as a result of the proposed action. Increases in population in the area and most likely general public interest in this threatened community pose an indirect threat to this TEC. However, this indirect impact is unlikely as passive management measures will be employed in and around Lake Richmond with pedestrian access ways and lookouts into the lake preventing the degradation of this threatened ecological community.

Table 3 Assessment of potential impacts to thrombolite community against the Significant impact criteria

Significant impact criteria	Comment
Will the proposed action reduce the extent of the ecological community?	Unlikely. Any change in water quality in Lake Richmond could affect the population of thrombolites within Lake Richmond and the potential for changes to the water quality of Lake Richmond as a result of the proposed action is currently being investigated. Preliminary indications are that the proposed action will have no direct or indirect impacts on Lake Richmond and the hydrological and hydrogeological systems that support it. If investigations indicate a significant impact on water quality is likely, the proposed action will be modified to avoid this impact.
Will the proposed action fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines?	Unlikely. The proposed action is unlikely to fragment the existing population of this community as it is only located within Lake Richmond.
Will the proposed action adversely affect habitat critical to the survival of an ecological community?	Unlikely. Lake Richmond is habitat critical to the survival of the thrombolite. Current indications are that the proposed action will not affect water quality in Lake Richmond. If investigations indicate a significant impact on water quality is likely, the proposed action will be modified to avoid this impact.
Will the proposed action modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns?	Unlikely. Current indications are that the proposed action will not affect water quality or quantity in Lake Richmond. If investigations indicate a significant impact on water quality or quantity is likely, the proposed action will be modified to avoid this impact.
Will the proposed action cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting?	Unlikely. Current indications are that the proposed action will not affect the water quality or quantity in Lake Richmond upon which the thrombolite community is dependent. If investigations indicate a significant impact on water quality or quantity is likely, the proposed action will be modified to avoid this impact.
Will the proposed action cause a reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: a. assisting invasive species, that are harmful to the listed ecological community, to become established b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community	Unlikely. The proposed action is unlikely to result in the introduction of invasive species into Lake Richmond that are harmful to this community. Groundwater and surface water flows in a south-westerly direction away from the Lake. Therefore potentially invasive species, such as algae which may smother the community, are more likely to result from increases in nutrients from urban stormwater runoff further upstream in the catchment than from the proposed action. The proposed action is unlikely to introduce disease, mobilisation of fertilisers or other chemicals or pollutants, to cause the species to decline.
Will the proposed action interfere with the recovery of an ecological community?	Unlikely. The proposed action is unlikely to interfere with the recovery of the species.

Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (endangered TEC)

The proposed action boundary is greater than 200 m from the sedgeland on Lake Richmond and there will be no direct impact on this community as a result of the action. As discussed for the thrombolite communities, the potential indirect impacts on Lake Richmond are hydrological changes as a result of the inland marina that could affect groundwater quality and therefore the quality of groundwater discharge into the lake.

The sedgeland TEC is likely to utilise the shallow fresh groundwater in the Safety Bay Sands around the lake. Any potential change in groundwater quality would occur at depth and therefore the sedgeland TEC is highly unlikely to be affected. However, the groundwater investigations and modelling being undertaken will examine any potential for this to occur.

Other potential indirect impacts to this threatened ecological community may include increase in pressures to Lake Richmond and its surrounds as a result of increased human traffic in the area as a result of the proposed action. However, this indirect impact is unlikely to occur as passive management measures will be employed in and around Lake Richmond with pedestrian access ways and lookouts into the lake preventing the degradation of this threatened ecological community.

Overall, impacts both direct and indirect to this TEC are unlikely as a result of this proposed action and therefore not considered further in this referral.

Graceful Sun Moth (Endangered)

A small area of GSM habitat (*Lomandra maritima*) will be affected by the proposed action. One GSM was found within the impact area and two outside of this area (approximately 125 m and 500 m from the proposed action boundary) during the survey, indicating that the species is represented locally outside the proposed action footprint. An additional *Lomandra maritima* survey will be undertaken within and outside the proposed action footprint to further define the distribution of the GSM habitat in the area.

The recently released interim Department of Environment and Conservation GSM report for the Swan Coastal Plain and the southern Midwest region of Western Australia (DEC 2010) outlines the outcomes of the 2010 season GSM surveys undertaken in these regions together with significant impact guidelines and research priorities for this species in Western Australia. Table 4 below outlines the significant impact guidelines detailed in the interim report together with an assessment of the proposed action against these thresholds. A conservation advice statement is currently being prepared by the Nature Conservation Division of the DEC (DEC 2010). This document will outline management actions for implementation on sites where GSM have been located (DEC 2010). An assessment of the potential impacts against the Department of Environment, Water, Heritage and Arts guidelines is included in Table 5, utilising the DEC guidelines.

Table 4 DEC significant impact guidelines for the GSM

Ecological element affected	DEC impact threshold	Description of threshold	Proponent assessment against impact threshold
Large or contiguous habitat area (> 10ha)	Habitat loss, degradation or fragmentation > 0.5 ha	Habitat is similar or connected in the area within which the GSM is found during surveys or known from records. The function of the area may include, but is not limited to: feeding, breeding and dispersal.	The proposed action will result in GSM habitat loss through direct clearing. The extent of the habitat and the extent of the loss will be determined in the second habitat survey yet to be undertaken.
Small or fragmented habitat area (<10 ha)	Any habitat loss, degradation or fragmentation	Small areas of habitat are more likely to suffer significant impacts from loss, degradation and fragmentation than larger areas. The limited dispersal ability of the GSM means that habitat areas separated by >200m are effectively isolated and should be considered as isolated habitat areas.	The proposed action will result in GSM habitat loss through direct clearing. The potential habitat within the proposed action footprint is highly fragmented and cut off (by unsuitable habitat) from a possible community outside the footprint and is considered isolated habitat.

		Extremely small, isolated and degraded habitat patches (e.g. <0.25 ha) may support populations of GSM but are unlikely to contribute to the overall ecological health of the species.	The proposed action footprint and adjacent bushland represents small, isolated and degraded patches of habitat. The bushland at Mangles Bay is at least 3 km from the nearest large area of vegetation and as such is not likely to contribute to the overall ecological health of the species.
Habitat connectivity	Fragmentation of a population through the introduction of a barrier to dispersal	Barriers to dispersal could include: breaks in habitat of >200m; structures that prohibit movement (e.g. buildings, solid fences)	The proposed action may introduce barriers to dispersal but is unlikely to significantly impact upon the GSM population due to existing habitat fragmentation.

Table 5 Assessment of potential impacts to Graceful Sun-moth against significant impact criteria

Significant impact criteria	Comment
Will the proposed action lead to a long-term decrease in the size of a population?	Unknown. It is unknown whether the proposed action will lead to a long-term decrease in the size of this population. Only one GSM was found within the core project area. Little information is known about the species population size and distribution on the Swan Coastal Plain.
Will the proposed action reduce the area of occupancy of the population?	Yes. The proposed action will reduce the area of occupancy of this species as it involves clearing of <i>Lomandra</i> habitat. The area of disturbance for the proposed action comprises isolated patches of 'low' to 'medium to high' densities of <i>Lomandra maritima</i> which will require clearing. An additional <i>Lomandra maritima</i> survey will be undertaken outside the proposed action area to determine the distribution and density of the potential Graceful Sun Moth habitat in adjacent areas.
Will the proposed action fragment an existing population into two or more populations?	Unlikely. Habitat in the footprint of the proposed action comprises small, isolated patches and the action is bounded by the coast.
Will the proposed action adversely affect habitat critical to the survival of the species?	Unlikely. Recent survey work by DEC indicates that habitat critical to this species is more widespread than originally thought along the Swan Coastal Plain, with the range of the species extending from near Binningup, in the south, to Coolimba Rd, 8 km north of Leeman, in the north of the Swan Coastal Plain. Therefore, it is highly unlikely that the habitat within the proposed action area is critical to the survival of the species. <i>Lomandra maritima</i> has been mapped outside the proposed action footprint, together with two GSM individuals, which may represent the potential for local habitat to the south of the proposed action to support a GSM population/s.
Will the proposed action disrupt the breeding cycle of a population?	Unknown. It is unknown whether the proposed action will disrupt the breeding cycle of this species. Little information is known regarding whether noise or other construction effects would disrupt the moths outside of the proposed action footprint. As the species exists close to developed areas, it seems likely that the breeding cycle will not be affected by indirect impacts of construction and development.

Will the proposed action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?	Unlikely. Recent survey work by DEC indicates that extremely small, isolated and degraded habitat patches (e.g. <0.25 ha) may support populations of graceful sun-moth but are unlikely to contribute to the overall ecological health of the species. GSM habitat within the proposed action footprint is highly fragmented and occurs in small patches. Therefore it is unlikely that the clearing of Lomandra habitat will cause the species to decline. However, additional Lomandra mapping scheduled for the project will need to confirm this.
Will the proposed action result in invasive species that are harmful to a endangered species becoming established in the endangered species habitat?	Unlikely. The area has been subject to weed invasion, rubbish dumping and uncontrolled access for many years as a result of being surrounded by urban development. The vegetation within the proposed action footprint has been classified as being in a 'good' to 'degraded' condition under the Keighery vegetation condition scale (Keighery 1994) as a result of the level of weeds and disturbance that exist. As part of the project objectives, rehabilitation within and outside of the proposed action footprint will take place which will remove invasive species that may be harmful to this species and its associated habitat.
Will the proposed action introduce disease that may cause the species to decline?	Unlikely. The proposed action area has had a long history of human impact and there will be no new disease pathways introduced as a result of the proposed action.
Will the proposed action interfere with the recovery of the species?	Unlikely. Recent survey work by DEC indicates that this species is more widespread than previously anticipated along the Swan Coastal Plain and occurs in greater densities than within the proposed action footprint. It is unlikely that clearing of Lomandra habitat will interfere with the recovery of the species, however further scheduled surveys for the proposed action will require this to be confirmed.

3.1 (e) Listed migratory species

Description

A total of 23 migratory species (birds and marine reptiles/mammals) were identified as potentially occurring within and around the proposed action footprint by the EPBC Act Online Protected Matters Search Tool (Table 6 (migratory shorebirds) and Table 8 (migratory marine species)). An additional 28 migratory bird species were identified by ENV (2010b) as potentially occurring within or around the proposed action footprint (Table 7). Of these, two migratory bird species were recorded within the area, with 3 species recorded at the adjacent Lake Richmond and one species located at the tip of Cape Peron (approximately 2 km west of the proposed action footprint).

Table 6 Protected Matters Tool database search for migratory bird species potentially to occur within proposed action footprint (shaded rows indicate located species)

Migratory Bird common name	Scientific name	Type of presence (as per EPBC search tool)	Likelihood of occurrence (as assessed by Proponent)	Likelihood of impact
Great Egret, White Egret	<i>Ardea alba</i>	Species or species habitat may occur within area	Unlikely to occur.	Not identified by ENV (2010) to occur within proposed action footprint. However, this species may forage at Lake Richmond. Impacts to Lake Richmond are not expected to occur as part of this proposed action, hence impacts to this species are unlikely.
Cattle Egret	<i>Ardea ibis</i>	Species or species habitat may occur within area	Unlikely to occur within proposed action footprint area.	Species is likely to forage at Lake Richmond. Impacts to Lake Richmond are not expected to occur as part of this proposed action, hence impacts to this species are unlikely.
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	Species or species habitat likely to occur within area	Unlikely to occur.	Suitable habitat in wetlands of Lake Richmond and may occur within this area.
Fork-tailed Swift	<i>Apus pacificus</i>	Species or species habitat may occur within area	May occur in high air space of proposed action area.	Impacts are unlikely as the species forages in high airspace.
Rainbow Bee-eater	<i>Merops ornatus</i>	Species or species habitat may occur within area	Located outside the proposed action footprint near Lake Richmond.	Impacts from the proposed action are unlikely as direct impacts will not occur outside this area on Lake Richmond.
Gibson's Albatross	<i>Diomedea gibsoni</i>	Species or species habitat may occur within area	Unlikely to occur due to lack of appropriate habitat.	Impacts are unlikely to occur to this species.
Southern Giant-Petrel	<i>Macronectes giganteus</i>	Species or species habitat may occur within area	Unlikely to occur due to lack of appropriate habitat.	Impacts are unlikely to occur to this species.
Northern Giant-Petrel	<i>Macronectes halli</i>	Species or species habitat may occur within area	Unlikely to occur due to lack of appropriate habitat.	Impacts are unlikely to occur to this species.
Shy Albatross, Tasmanian Shy Albatross	<i>Thalassarche cauta (sensu stricto)</i>	Species or species habitat may occur within area	Unlikely to occur due to lack of appropriate habitat.	Impacts are unlikely to occur to this species.

Table 7 Migratory bird species listed by ENV 2010 (and not identified in EPBC search tool) as potentially occurring within proposed action footprint and surrounds

Migratory Bird common name	Scientific name	Likelihood of occurrence (as assessed by ENV 2010)	Likelihood of impact
Eastern Great Egret	<i>Ardea modesta</i>	Located outside the proposed action footprint. This species is likely to forage at Lake Richmond	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Eastern Reef Egret	<i>Ardea sacra</i>	Likely to occur on beaches and rocky shores outside the proposed action footprint.	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Glossy Ibis	<i>Plegadis falcinellus</i>	Likely to occur at Lake Richmond as it contains suitable foraging habitat for this species.	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Eastern Osprey	<i>Pandion cristatus</i>	This species was recorded at different locations outside the proposed action footprint, with a nest located on a rocky island in Shoalwater Bay	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Black-tailed Godwit	<i>Limosa limosa</i>	Likely to occur as the proposed action footprint may provide suitable habitat.	Impacts to this species are unlikely as the species was not recorded within the area.
Bar-tailed Godwit	<i>Limosa lapponica</i>	Unlikely to occur in proposed action footprint. Habitat around proposed action footprint (Lake Richmond) may provide habitat during migration.	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Whimbrel	<i>Numenius phaeopus</i>	Unlikely. Lake Richmond may provide habitat during migration.	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Eastern Curlew	<i>Numenius madagascariensis</i>	Unlikely. Lake Richmond may provide habitat during migration.	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Unlikely. Lake Richmond may provide habitat during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Common Greenshank	<i>Tringa nebularia</i>	Unlikely. Due to small areas of rocky coast suitable for this species within the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Wood Sandpiper	<i>Tringa glareola</i>	Unlikely. Lake Richmond may provide habitat during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Terek Sandpiper	<i>Xenus cinereus</i>	Unlikely. Sandy beaches around the proposed action footprint may provide habitat during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.

Common Sandpiper	<i>Actitus hypoleucos</i>	Unlikely. Rocks and sandy beaches are preferred habitat as it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Grey-tailed Tattler	<i>Tringa brevipes</i>	Unlikely. Due to small areas of rocky coast suitable for this species, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Ruddy Turnstone	<i>Arenaria interpres</i>	Unlikely. Due to small areas of rocky coast suitable for this species within the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Red Knot	<i>Calidris canutus</i>	Unlikely. Due to small areas of tidal sands suitable for this species within the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Great Knot	<i>Calidris tenuirostris</i>	Unlikely. Due to small areas of tidal sands suitable for this species within the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Sanderling	<i>Calidris alba</i>	Unlikely. Due to small areas of tidal sands suitable for this species within the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Red-necked Stint	<i>Calidris ruficollis</i>	Likely. Coastal waters of the proposed action footprint provide suitable habitat, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Long-toed Stint	<i>Calidris subminuta</i>	Unlikely. Potential habitat surrounding Lake Richmond may provide habitat during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Unlikely. The coastal wetlands (Lake Richmond and other wetlands i.e. Thomsons Lake and Becher Point wetlands) may provide suitable habitat, it may inhabit this area during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Curlew Sandpiper	<i>Calidris ferruginea</i>	Unlikely. The coastal wetlands (Lake Richmond and other wetlands i.e. Thomsons Lake and Becher Point wetlands) may provide suitable habitat, it may inhabit this area during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.
Ruff	<i>Philomachus pugnax</i>	Unlikely. The coastal wetlands (Lake Richmond and other wetlands i.e. Thomsons Lake and Becher Point wetlands) may provide suitable habitat, it may inhabit this area during migration	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.

Grey Plover	<i>Pluvialis squatarola</i>	Unlikely. Due to small areas of rocky coast suitable for this species in the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Pacific Golden Plover	<i>Pluvialis squatarola</i>	Unlikely. Due to small areas of rocky coast suitable for this species in the proposed action footprint, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Lesser Sand Plover	<i>Charadrius leschenaultii</i>	Likely. Exposed sand of the proposed action footprint provide suitable habitat, it may inhabit this area during migration	Impacts to this species are unlikely as beaches and rocky shores will not be impacted as part of this proposed action.
Bridled Tern	<i>Sterna anaethetus</i>	Located outside the proposed action footprint on coastal islands around the survey area.	Impacts to this species are unlikely, as impacts to nearby islands (Garden Island) are not expected to occur.
Australian Reed-warbler	<i>Acrocephalus australis</i>	Located outside proposed action footprint in bull rushes and reeds of Lake Richmond.	Impacts to this species are unlikely as impacts to Lake Richmond are not expected to occur as a result of the proposed action.

Table 8 Protected Matters Tool database search for migratory marine species potentially to occur within proposed action footprint

Migratory Marine species common name	Scientific name	Type of presence (as per EPBC search tool)	Likelihood to occur within proposed action footprint	Likelihood of impact
Bryde's Whale	<i>Balaenoptera edeni</i>	Species or species habitat may occur within area	Unlikely to occur as species associated with adjacent Shoalwater Islands Marine Park	Unlikely to be impacted, as minimal marine disturbance will occur, with the majority of impact to occur on land.
Blue Whale	<i>Balaenoptera musculus</i>	Species or species habitat may occur within area		
Pygmy Right Whale	<i>Caperea marginata</i>	Species or species habitat may occur within area		
Southern Right Whale	<i>Eubalaena australis</i>	Species or species habitat may occur within area		
Dusky Dolphin	<i>Lagenorhynchus obscurus</i>	Species or species habitat may occur within area		
Humpback Whale	<i>Megaptera novaeangliae</i>	Species or species habitat may occur within area		
Killer Whale, Orca	<i>Orcinus orca</i>	Species or species habitat may occur within area		
Loggerhead Turtle	<i>Caretta caretta</i>	Species or species habitat may occur within area		
Green Turtle	<i>Chelonia mydas</i>	Species or species habitat likely to occur within area		
Leatherback Turtle, Leathery Turtle, Luth	<i>Dermochelys coriacea</i>	Species or species habitat known to occur within area		
Great White Shark	<i>Carcharodon carcharias</i>	Species or species habitat may occur within area		
Whale Shark	<i>Rhincodon typus</i>	Species or species habitat may occur within area		

Nature and extent of likely impact

Migratory marine mammals and reptile species

Migratory marine mammals and reptiles were identified by the EPBC Act protected Matters Search tool as potentially occurring within the proposed action footprint. It is unlikely that these species will occur within the footprint area as the majority of the action will occur on the land, with minimal disturbance to shallow marine areas along the coastal shores. It is likely that the search tool identified these species due to the adjacent location of the Shoalwater Islands Marine Park (Figure 3), which encompasses a diverse marine environment. The Marine Park will not be affected and therefore these species are not considered likely to be affected as a result of the proposed action and therefore are not considered further as part of this referral.

Migratory shorebirds

Direct impacts to potential habitats of migratory species are unlikely to occur as potential habitat is mostly outside of the proposed action footprint.

The significant impact criteria used in determining the risk to migratory shorebird species (Table 9) is based on the Draft EPBC Act Policy Statement 3.21 *Significant impact guidelines for 36 migratory shorebird species, Migratory species.*

Table 9 Assessment of potential impacts against migratory shorebird species against the significant impact criteria

Significant impact criteria	Comment
Does the site or nearby support habitat for one or more migratory shorebird species?	Yes, the site and adjacent Lake Richmond supports habitat for the migratory shore species listed in Table 5. However, according to the draft EPBC Act Policy Statement 3.21 (DEWHA 2009), defining important habitat for migratory shore birds (DEWHA 2009), the proposed action footprint and surrounding habitat is not considered an important habitat as it represents: <ul style="list-style-type: none"> • <0.1% of the flyway population of a single species • <2000 migratory shorebirds • < 15 shorebird species.
What impacts to migratory shorebirds, both direct and indirect, could result from this action?	Direct impacts to migratory shorebirds as a result of this action are unlikely as: <ul style="list-style-type: none"> • wetland habitat for these species occurs around Lake Richmond, which is not expected to be impacted as a result of this action • shore and rocky habitat is minimal within the proposed action footprint, with most rocky habitat located at Point Peron. Indirect impacts to migratory shorebirds as a result of this action are unlikely or minimal. These indirect impacts may include: <ul style="list-style-type: none"> • alterations in surface water/groundwater regimes as a result of the construction of the marina which impact vegetation • short term disturbances as a result of noise and dust.
Could any of these impacts exceed the thresholds?	It is unlikely that the impacts described above will exceed thresholds of significant impact on migratory bird species. Impact thresholds are unlikely to be exceeded as the proposed action footprint is not considered critical habitat for migratory shorebird species.
What measures could be taken to reduce the level of impact?	It is unlikely that the degradation of important habitat will occur as a result of the proposed action. Rehabilitation outside the proposed action footprint will improve the condition of potential habitat areas. Lake Richmond is also the primary habitat for migratory shore species and will not be directly affected by this proposed action. Indirect impacts on Lake Richmond have not yet been quantified, therefore the consequence of these indirect impacts on the surrounding environment at Lake Richmond cannot be determined until the hydrogeological investigations and modelling of the marina currently being undertaken are complete. Final marina layout will be determined on the basis of avoiding any impact on Lake Richmond.

	<p>Increased disturbance in the area may lead to a small reduction in migratory birds during the construction stage of the proposed action. The alteration in landscape, noise and dust may deter migratory species in the short term. However, this disturbance will be temporary and once the proposed action is completed, stabilised and rehabilitation of adjacent areas is underway, it is likely that migratory bird species will return to the area.</p> <p>Direct mortality of birds may result during the construction stages of the proposed action. A fauna management plan implemented during the construction stages will include measures to:</p> <ul style="list-style-type: none"> • remove potential sedentary species in the direct impact area • avoid potential breeding sites/nests • educate construction personnel to identify and avoid impacts to these species.
--	---

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

There are no Commonwealth marine areas potentially affected by the proposed action.

Nature and extent of likely impact

There will be no impacts to Commonwealth marine areas as part of this proposed action.

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

The proposed action does not involve Commonwealth land.

Nature and extent of likely impact

The proposed action does not occur on Commonwealth land.

3.1 (h) The Great Barrier Reef Marine Park

Description

The proposed action does not involve the Great Barrier Reef Marine Park.

Nature and extent of likely impact

The proposed action does not occur within or near the Great Barrier Reef Marine Park.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	Is the proposed action a nuclear action?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

3.3 Other important features of the environment

3.3 (a) Flora and fauna

Flora

Seventy-five species, comprising 37 families and 65 genera were recorded in and around the proposed action footprint (41 native flora species and 34 introduced). The most common families recorded were Poaceae (13 species), Asteraceae (6 species), Mimosaceae (5 species), Myrtaceae (5 species). The plant genera most frequently encountered on the site were *Acacia* (5 species) and *Euphorbia* (3 species). No threatened flora species pursuant to the EPBC Act were located in the area. No plant taxa gazetted as Declared Rare pursuant to the Western Australian *Wildlife Conservation Act 1950* were located in the survey area. No Priority Flora species were located within the survey area (ENV 2010a).

Six locally significant species were recorded across the site. The species are considered locally significant as they are at the northern extension of their known range and are considered a significant population according to ENV (2010a). These species are not listed for protection but are considered to be of interest.

One Declared Plant (weed) species, *Asparagus asparagoides* (bridal creeper), listed by the Agriculture and Related Resources Act is known to occur within the proposed action footprint. This species is listed as a Weed of National Significance and is also listed as a Priority 1 species in Western Australia. The Western Australian requirements for weeds listed as Priority 1 are:

- the movement of this species and its seeds within the State is prohibited
- the movement of contaminated machinery and produce including livestock and fodder is prohibited.

Bridal Creeper invades dry coastal vegetation, heathland and healthy woodland, mallee shrubland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, riparian vegetation, rock outcrop vegetation, and warm temperate rainforest (Department of Agriculture 2010). As part of the construction stages of the proposed action, a weed management plan will be developed to prevent the spread of this weed species, in accordance with Department of Agriculture and Food management requirements.

Fauna

A total of 96 terrestrial vertebrate fauna were recorded at and around the proposed action footprint, including five amphibian species, 19 reptile species, 66 bird species and six mammal species (ENV 2010b). Seven fauna species of conservation significance were recorded within the survey area. Six of these species, namely the Eastern Great Egret (*Ardea modesta*), Eastern Osprey (*Pandion cristatus*), Common Sandpiper (*Actitis hypoleucos*), Bridled Tern (*Sterna anaethetus*), Rainbow Bee-eater (*Merops ornatus*) and Australian Reed-warbler (*Acrocephalus australis*) are listed as Migratory under the EPBC Act. One species, the Lined Skink (*Lerista lineata*) is listed as Priority 3 on the DEC Priority list.

Thirty-four conservation significant species potentially occur within habitat found within the proposed action footprint and despite the significant survey effort these fauna species were not recorded. Ornithological censuses were undertaken within woodland habitat to determine the presence or absence of black cockatoo species, in particular, Carnaby's Black Cockatoo. No foraging or breeding habitat and very little roosting potential exists within the area. Targeted surveys for the Quenda and Brush-tailed Phascogales (ENV 2010b), previously recorded within the area, failed to record either of these species and they are not now expected to reside in the area given the low number of tree hollows suitable for shelter.

3.3 (b) Hydrology, including water flows

Lake Richmond is the significant hydrological feature in the landscape, adjacent to the proposed action. Lake Richmond currently receives stormwater from the surrounding urban area from three outlets which flow into the lake. An overflow system draining to the ocean from Lake Richmond prevents potential flooding from large rainfall events. The hydrology within the area has been altered due to the development of the surrounding urban environment.

3.3 (c) Outstanding natural features

There are no outstanding natural features (e.g. caves) in the vicinity of the site.

3.3 (d) Remnant native vegetation

The proposed action footprint consists of upland vegetation communities on Quindalup Dunes interspersed with cleared land associated with roads and informal tracks. All land within the footprint area is within Bush Forever Area (BFPA) 355 and Rockingham Lakes Regional Park. The species composition of the vegetation varies across the site, due to edaphic and topographical factors and the amount of shelter from the salt laden winds (Strategen 2006). In restricted localised pockets there are remnants of low closed forest of *Melaleuca lanceolata* and *Callitris preissii*, with other localised occurrences of *Eucalyptus foecunda*, *Pittosporum ligustrifolium*, *Santalum acuminatum*, *Exocarpus sparteus* and *Acacia rostellifera* (Bennett 2005).

3.3 (e) Current state of the environment

Terrestrial environment

The condition of the vegetation in the proposed action footprint varies from Very Good to Completely Degraded according to the Keighery condition rating (ENV 2010a). There is no vegetation within the area that is considered in excellent condition and there are only patches of vegetation mapped as Very Good condition. This can be attributed to surrounding urban land uses and uncontrolled access through the area.

Lake Richmond

Although not within the proposed action footprint, Lake Richmond is considered within this referral due to potential indirect impacts from the marina which is part of the proposed action. Lake Richmond is a throughflow lake receiving groundwater discharge from the Safety Bay aquifer in a southerly arc spanning the lake from east to west. The lake discharges to the north where it becomes part of the groundwater flow system, eventually discharging into Cockburn Sound (Strategen 2006). The lake has a highly modified hydrological regime as it is surrounded by urban development and receives stormwater runoff from drains receiving much of the stormwater from Rockingham, Shoalwater and Safety Bay. Currently, there are three main drains into Lake Richmond and one outlet drain that traverses the project area and discharges to Mangles Bay.

Marine environment

The Cape Peron shoreline consists of sandy beaches, limestone rocky shores and headlands and the seabed consists of extensive sandy areas and limestone reefs. The shallow, sheltered waters of Cockburn Sound (including Mangles Bay) support extensive seagrass meadows and a wide range of marine fauna.

To the west of the proposed action footprint (western side of Point Peron) is the Shoalwater Islands Marine Park which comprises the chain of islands that run parallel to the coastline between Cape Peron and Becher Point to the south. The Marine Park borders Mangles Bay at the Garden Island Causeway and contains the waters of Shoalwater Bay, Warnbro Sound and a part of Cockburn Sound off Cape Peron (Strategen 2006).

The seagrass meadows in Mangles Bay show evidence of nutrient enrichment in the form of heavy epiphyte loads in summer and some areas of seagrass are partially exposed at low tide and experience desiccation and heat stress. The seagrass meadows are also damaged by numerous mooring scars (Strategen 2006). Although the seagrass meadows that Mangles Bay supports are degraded, the shallow, sheltered, slightly nutrient-enriched waters of Mangles Bay are also recognised as an important fish nursery habitat (Strategen 2006).

Water within Cockburn Sound and Mangles Bay has had a history of poor water quality as the area was subject to discharges of industrial waste and domestic wastewater into Cockburn Sound in the late 1970s. Since then, water quality has improved, however it is still considered an important management issue due to intensive multiple uses in the sound including Fremantle Port outer harbour, discharge of industrial effluent and cooling water, power station cooling water, a strategic naval base, commercial fishing and intensive recreational use. The water quality of Cockburn Sound is also due, in part, to its enclosed nature (by Parmelia Bank to the north, Garden Island to the west, and the Garden Island Causeway to the south west), which reduces exchange (flushing) with the water of Owen Anchorage to the north and the open ocean to the west and south (Strategen 2006).

3.3 (f) Commonwealth Heritage Places or other places recognised as having heritage values

Not applicable.

3.3 (g) Indigenous heritage values

Two listed Aboriginal heritage sites lie partly within the proposed action footprint, Cockburn Sound (site no. S02169) and parts of the foreshore that encompasses Rotary Park (site no. S02625). Both these sites are of mythological significance.

Consultation undertaken in 2005 with the local Aboriginal community identified several additional sites on Cape Peron of significance to the local Aboriginal community, including a meeting/ learning place, burial area, ceremonial/ dancing area and a former holiday camp for Sister Kate's orphanage.

3.3 (h) Other important or unique values of the environment

Gun emplacements were built on Cape Peron in 1942. The Cape Peron Battery Complex is now listed on the Rockingham Municipal Heritage Inventory and the Register of the National Estate. HMAS Stirling Naval Base was commissioned on Garden Island in 1978 (Royal Australian Navy 2000) and is serviced by The Garden Island Causeway adjacent to the proposed action.

Other buildings that are listed on the State heritage database and the Rockingham Municipal Heritage Inventory within the Cape Peron area include:

1. The Cape Peron Recreation Camp buildings: located to the west of the Garden Island Causeway and currently leased to the Education Department. These buildings were constructed in 1942 for use as military barracks.
2. The 'Turtle Factory' building: constructed in 1923 initially to farm turtles for food production. This venture was unsuccessful and the building was later used to operate a boarding facility and then used by the Sisters of Notre Dame des Missions as a convent school (City of Rockingham 2004).

3.3 (i) Tenure of the action area (e.g. freehold, leasehold)

The land within the proposed action footprint will be rezoned to Urban and will be a combination of freehold and strata title land (tourist, mixed use, commercial and residential). Public open space and the marina will be vested in the relevant government authority.

Currently, the area to the south of Point Peron Road is zoned as 'Parks and Recreation' and the area to the north of Point Peron Road, along Mangles Bay foreshore, is reserved 'Port Installations' under the Perth Metropolitan Region Scheme.

3.3 (j) Existing land/marine uses of area

The Cape Peron area is the focus for the pursuit of many recreational activities, including:

Water based activities: boating, swimming, snorkelling, fishing and crabbing

Land based activities: walking, fishing and nature appreciation.

A large proportion of the Mangles Bay foreshore is currently occupied by the local yacht club, fishing club (with associated jetty and boat ramp) and chalet accommodation. The use of the land by these facilities means that public access to the area is somewhat restricted.

Other facilities within the Mangles Bay area include day-use car parks for accessing beaches and lookouts and a public boat ramp directly to the west of the Garden Island Causeway. The City of Rockingham is currently undertaking minor upgrade works to the boat ramp.

Most of the Mangles Bay foreshore is a designated dog beach and an area directly to the east of the Garden Island Causeway is designated a power water craft and water ski area.

The Naragebup Rockingham Regional Environment Centre is located on the southwest corner of the Memorial Drive / Safety Bay Road intersection, opposite Lake Richmond. The centre is a community run non-profit organisation that is actively involved in conservation activities in the Rockingham area and also provides a role in environmental education.

The Water Corporation Point Peron Wastewater Treatment Plant is located to the west of the Garden Island Causeway and a Water Corporation drain dissects the landscape from Lake Richmond to Mangles Bay.

Residential areas are located to the east and south of the proposed action.

3.3 (k) Any proposed land/marine uses of area

The proposed action is for the development of a tourist-based inland marina which will accommodate more than 500 boat pens, including local boating clubs, commercial areas and boat pens for public use (both short and long-term). The surrounding land use will be 'mixed-use' with recreational, commercial and residential components for both locals and visitors.

4 Measures to avoid or reduce impacts

Mitigation measures are being developed to offset any potential adverse environmental impacts that may result from the proposed development.

In summary, the key elements of mitigation include:

- rehabilitation of the natural environment of the Cape Peron and Lake Richmond area to enhance the ecological linkage between the lake and Point Peron
- rehabilitation of seagrass meadows in and around Mangles Bay
- environmental management during construction including fauna relocation and handling procedures
- provision of environmental/educational opportunities (e.g. interpretive nature trail, Aboriginal interpretive centre and a site for a marine education and training facility).

In addition to the above general measures, the key mitigation relevant to Matters of NES will be the investigation and avoidance of potential impacts on Lake Richmond. There is a potential for indirect impacts on the hydrology of Lake Richmond and although this is considered unlikely, this potential is currently being investigated. If investigations and modelling indicate a significant impact is likely, the action would be modified (e.g. move the marina boundary further from Lake Richmond or implement engineering controls to prevent salt water seepage into the groundwater) to avoid this impact.

Measures to avoid and reduce indirect impacts to Lake Richmond and its surrounding vegetation from increases in human population pressures include improved passive recreation facilities to allow access and provide information while preventing the degradation of these areas. Passive measures include the installation of appropriate pedestrian walkways, signage and viewing platforms to experience the lake and the thrombolites. With the implementation of these management measures, it is unlikely that indirect impacts from increases in human population traffic, on the threatened ecological communities of Lake Richmond, will occur as a result of this action.

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

- | | |
|-------------------------------------|---------------------------|
| <input type="checkbox"/> | No, complete section 5.2 |
| <input checked="" type="checkbox"/> | Yes, complete section 5.3 |

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

5.3 Proposed action IS a controlled action

Matters likely to be impacted

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | World Heritage values (sections 12 and 15A) |
| <input type="checkbox"/> | National Heritage places (sections 15B and 15C) |
| <input type="checkbox"/> | Wetlands of international importance (sections 16 and 17B) |
| <input checked="" type="checkbox"/> | Listed threatened species and communities (sections 18 and 18A) |
| <input type="checkbox"/> | Listed migratory species (sections 20 and 20A) |
| <input type="checkbox"/> | Protection of the environment from nuclear actions (sections 21 and 22A) |
| <input type="checkbox"/> | Commonwealth marine environment (sections 23 and 24A) |
| <input type="checkbox"/> | Great Barrier Reef Marine Park (sections 24B and 24C) |
| <input type="checkbox"/> | Protection of the environment from actions involving Commonwealth land (sections 26 and 27A) |
| <input type="checkbox"/> | Protection of the environment from Commonwealth actions (section 28) |
| <input type="checkbox"/> | Commonwealth Heritage places overseas (sections 27B and 27C) |

The proposed action is likely to have minor direct impacts and has potential indirect impacts to Listed threatened species and communities. Although it is considered that significant impacts are unlikely, the proponent recognises that sufficient information is not provided in this referral to demonstrate that conclusively.

A conservative approach is being undertaken by assuming the proposed action will be determined to be a controlled action due to the potential impact on this species. It is anticipated the environmental impacts of the proposed action will be able to be assessed through an accredited bilateral process between the State of Western Australia and the Department of Environment, Water, Heritage and Arts.

The direct impact of the proposed action will be the clearing of Graceful Sun Moth habitat (total area of habitat to be confirmed following additional *Lomandra maritima* survey). Further investigations will be undertaken in regards to defining the potential habitat in surrounding areas and a subsequent Graceful Sun Moth survey will be undertaken to determine the distribution and likelihood of this species within and outside the proposed action footprint. However, conservation advice and species distribution information recently released from the DEC suggests that the species occurs more extensively than previously thought across the Swan Coastal Plain and therefore the habitat distribution within the project area is unlikely to support a significant population.

Potential indirect impacts may occur to the threatened ecological Thrombolite (microbial) community at Lake Richmond. Potential indirect impacts may occur to the hydrology of Lake Richmond that supports this community. Groundwater and surface water investigations are being undertaken to investigate the potential for the salt water interface to migrate inland towards the lake as a result of the inland marina. These studies will be completed in time to be able to support the environmental impact assessment process, anticipated to be conducted under the bilateral agreement as outlined above.

6 Environmental record of the responsible party

		Yes	No						
<p>6.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>Provide details</p> <p>About Cedar Woods Cedar Woods Properties Limited is an Australian property development company. The company was established in 1987 and has been listed on the Australian Stock Exchange since 1994. Its market capitalisation is now approximately \$200 million. The company's principal interests are in urban land and built form development for residential, industrial and commercial purposes. Its portfolio of assets is located in Western Australia and Victoria.</p> <p>The Board and management of Cedar Woods have extensive experience in adding value to land holdings, through the achievement of government and local authority approvals and planning and design process. Cedar Wood's projects are sensitively developed in consideration of environmental and community interests and built to a high quality that is renowned in the marketplace.</p> <p>Experience in delivery of environmentally sensitive projects</p> <p>Cedar Woods has been the recipient of numerous industry awards, in environmental categories which include the Urban Development Institute of Australia 'Environmental Excellence' Awards and Local Environmental Excellence Awards. Cedar Woods is also a strong advocate of the Housing Industry Association 'Green Smart' Initiative and has been awarded HIA Green Smart Development of the Year and the GreenSmart Partnership Award. Cedar Woods has also been recognised in the water management industry with awards for excellence receiving awards for Water Conservation and Efficiency. The table below includes examples that demonstrate Cedar Woods' commitment to delivering environmentally sensitive projects.</p> <table border="1"> <thead> <tr> <th>Example</th> <th>Environmental deliverables comparable to the proposed action</th> </tr> </thead> <tbody> <tr> <td>Mariners Cove Mandurah, Western Australia</td> <td> <ul style="list-style-type: none"> retention, improvement and preservation of 230 acres of wetland as part of the surrounding internally recognised Ramsar wetlands. The area was set as an offset as part of the environmental and rezoning process. </td> </tr> <tr> <td>State and National Urban Development Institute (UDIA) for environmental excellence (2002,2003)</td> <td> <ul style="list-style-type: none"> raised walkways for the community to interact and take ownership of the natural surroundings. water sensitive urban design included a vegetated snake drain to accept storm water for bioretention prior to discharging to estuarine waters construction of marina and canals in accordance with best environmental practice ongoing monitoring and maintenance of canal and marina waterways </td> </tr> </tbody> </table>		Example	Environmental deliverables comparable to the proposed action	Mariners Cove Mandurah, Western Australia	<ul style="list-style-type: none"> retention, improvement and preservation of 230 acres of wetland as part of the surrounding internally recognised Ramsar wetlands. The area was set as an offset as part of the environmental and rezoning process. 	State and National Urban Development Institute (UDIA) for environmental excellence (2002,2003)	<ul style="list-style-type: none"> raised walkways for the community to interact and take ownership of the natural surroundings. water sensitive urban design included a vegetated snake drain to accept storm water for bioretention prior to discharging to estuarine waters construction of marina and canals in accordance with best environmental practice ongoing monitoring and maintenance of canal and marina waterways 	✓	
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<p>The Rivergums, Baldivis, Western Australia</p> <p>One of the first HIA Greensmart accredited estates in Western Australia. UDIA award for Water Sensitive Urban Design</p>	<ul style="list-style-type: none"> established a benchmark for excellence in sustainability bringing in world best practice, implementing procedures for engineering, landscaping and construction orientation of lots were designed to optimise the ease for project builders to design passive solar homes with minimum additional cost sustainability initiatives throughout the building process including energy efficient appliances, passive solar design and rebates for garden bores and water-wise gardens environmental initiatives to restore the existing wetland and revegetate the adjoining tramway reserve have assisted with the conservation of the frog population and provide an important wildlife habitat 		
<p>The Kestrals, Tapping, Western Australia</p> <p>City of Wanneroo Environmental Excellence Award (2006)</p>	<ul style="list-style-type: none"> HIA Greensmart project Landscaped POS areas and road streetscapes were designed and planted to preserve and attract prominent native bird life tree selection to attract native bird species to the area 		
<p>Harrisdale Green, Harrisdale, Western Australia</p>	<ul style="list-style-type: none"> house designs will minimise the environmental footprint and include a number of research initiatives for the selection of building materials and application of various cutting edge technologies sustainability will be balanced with other objectives including affordability and liveability water Sensitive Urban design promotes maximising rainfall infiltration at the source providing large active POS areas and minimising the impact on groundwater groundwater modelling from hydrogeological investigations addressed community and government concerns as to the impact on an adjoining bush forever site and Harrisdale Lake 		
<p>6.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>If yes, provide details</p>			✓
<p>6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p> <p>If yes, provide details of environmental policy and planning framework</p> <p>Cedar Woods core objective is to be recognised as an environmentally responsible developer. The guiding principles to achieve this environmental objective are commitments to:</p> <ol style="list-style-type: none"> 1. Environmental enhancement: Actively seeks to remediate, protect and enhance areas of environmental significance and protect biodiversity. 2. Green Estates and Buildings: Provide for resource efficient, comfortable and healthy buildings through energy efficient lot configuration and building controls. 3. Urban Water Management: Manage the total water cycle to promote efficiency, preserve ecosystem health, reduce demand on potable water and improve protection of water quality at its source. 4. Public Open Space: Provide open space in a way that contributes to sense of place, maximised preservation of biodiversity, promotes healthy lifestyles and encourages efficient urban water management. 		✓	

5. Waste minimisation and recycling: Reduce waste sent to landfill and promote efficient use of resources.

6. Interface management: Maximise and adverse impacts to and from potentially conflicting land use, infrastructure and environmentally significant areas.

The proposed action is governed by all the above - many of which are already demonstrated in the supporting documentation provided.

6.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Provide name of proposal and EPBC reference number (if known)

2008/3339 Jarrah Property Pty Ltd/C/-Cedar Woods Properties Limited/Residential development/Lalor/VIC/Residential/possible industrial development

2006/2504 Cedar Woods Properties Limited/Urban and commercial new development/Laverton/VIC/Laverton activity centre and residential development

2006/3019 LandCorp/Transport - water/Albany /WA/Protected Harbour Development

2010/5337 LandCorp/Commercial development/Rockingham/WA/Industrial Zone

✓

7 Information sources and attachments

(For the information provided above)

7.1 References

- Bamford Consulting Ecologists 2005, *Fauna Assessment of Bush Forever Site 355 (Point Peron and adjacent bushland)*, unpublished report prepared for Strategen Environmental Consultants.
- Bennett Environmental Consulting 2005, *Flora and Vegetation Point Peron Western Australia*, unpublished report prepared for Strategen Environmental Consultants.
- Bishop, C. Williams, M. Gamblin, T. (2009) Graceful Sun-moth Information Kit and Survey Methods, Department of Environment and Conservation, Perth, Western Australia.
- Department of Agriculture, 2010, *Bridal Creeper listing and management measures*. [Online] Available from: <[http://agspsrv95.agric.wa.gov.au/dps/version02/01_plantview.asp?page=2&contentID=87&.\[6/09/2010](http://agspsrv95.agric.wa.gov.au/dps/version02/01_plantview.asp?page=2&contentID=87&.[6/09/2010)>
- English V, Blyth J, Gibson N, Pember D, Davis J, Tucker J, Jennings P, Walker B, 2002, *Sedgeland in Holocene Dune Swales Interim Recovery Plan 2002-2007*, Western Australian Threatened Species and Communities Unit Department of Conservation and Land Management, Western Australia
- ENV Australia 2010a, *Flora and Vegetation Survey of the Mangles Bay Area Cape Peron, Rockingham*, unpublished report prepared for Strategen Environmental Consultants.
- ENV Australia 2010b, *Cape Peron Fauna Assessment*, unpublished report prepared for Strategen Environmental Consultants.
- ENV Australia 2010c, *Cape Peron Graceful Sun Moth Survey*, unpublished report prepared for Strategen Environmental Consultants.
- Environmental Protection Authority (EPA) 2006, Environmental Offsets, Position Statement No. 9
- Keighery, B.J. (1994) Bushland Plant Survey. *A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc.), Western Australia.
- Strategen Environmental Consultants (Strategen) 2006, *Strategic Environmental Review Cape Peron Tourist Precinct Project*, unpublished report prepared for the Cape Peron Tourist Precinct Steering Committee
- Subterranean Ecology Scientific Environmental Services 2010, *Cape Peron Tourist Precinct Project Short Range Endemic (SRE) Terrestrial Invertebrates Desktop and Habitat Assessment*, unpublished report prepared for ENV Australia
- Subterranean Ecology Scientific Environmental Services 2010, *Cape Peron Tourist Precinct Project Stygofauna Desktop and Habitat Assessment*, unpublished report prepared for ENV Australia
- Subterranean Ecology Scientific Environmental Services 2010, *Cape Peron Tourist Precinct Project Troglifauna Desktop and Habitat Assessment*, unpublished report prepared for ENV Australia

7.2 Reliability and date of information

Information regarding the presence of matters of National Environmental Significance was obtained through EPBC Act Protected Matters Interactive Search Tool and from the DEWHA website (accessed August 2010). The Protected Matters Search Tool covered an area of approximately 440 hectares, including the proposed action footprint (covering 77 ha). This information is supplemented with results from vegetation, flora and fauna surveys, including a targeted Graceful Sun Moth survey.

Two flora and vegetation surveys have been conducted within and around the proposed action footprint. Bennett Environmental Consulting conducted a detailed level 1 survey over the area. The flora and vegetation survey was conducted over a three day period in June 2005. A total of 38 quadrats/relevees were surveyed. The second survey of the proposed action footprint was to supplement the 2005 survey with a targeted Declared Rare Flora, priority flora and floristic community type assessment for the proposed action footprint. The field survey was undertaken between 27 – 29 October 2009 in which permanent quadrats were established and the proposed action footprint was searched for DRF and Priority Flora species and any other flora of local or taxonomic significance.

Two fauna investigations have been conducted of the proposed action footprint and surrounds. An initial level 1 fauna survey was undertaken in July 2005, targeting the Bush Forever site 355 that comprises most of the proposed action footprint. A supplementary level 2 fauna survey was undertaken from 20 to 27 November 2009 with up to six nights invested during the survey. In addition 12 hours of diurnal searching, 16.5 hours of nocturnal spotlighting and 22 hours of ornithological census occurred within the survey area during the south-west spring season. Desktop assessments were undertaken for Short Range Endemic (SRE) species, stygofauna and troglofauna within the proposed action footprint. A targeted SRE survey is currently underway targeting millipede species.

An additional targeted search was undertaken for the Graceful Sun Moth in March 2010. The targeted survey was undertaken in accordance with the Department of Environment and Conservation's survey methodology and included the mapping of potential Graceful Sun Moth habitat within and around the proposed action footprint.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1 and Figure 2
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figure 3
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Appendix 2, 3 & 4
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)		
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	✓	Appendix 6

List of figures

Figure 1 Proposal Locality

Figure 2 Site plan – Proposal details

Figure 3 Site plan – existing environment

List of appendices

Appendix 1 Project Design Principles

Appendix 2 ENV (2010a) Australia Flora and Vegetation Survey 2010

Appendix 3 ENV (2010b) Australia Fauna Survey 2010

Appendix 4 ENV (2010c) Graceful Sun Moth Survey 2010

Appendix 5 EPBC Protected Matters Report 16 August 2010

Appendix 6 Strategen Environmental Consultants 2006, Strategic Environmental Review Cape Peron Tourist Precinct Project

Appendix 7 Point locations of proposed action footprint

8 Contacts, signatures and declarations

Project title: Mangles Bay Marina Based Tourist Precinct

8.1 Person proposing to take action

The Western Australian Government endorsed the progressing of the Mangles Bay Marina Based Tourist Precinct Proposal. Subsequently, the Western Australian Land Development Authority, LandCorp (Government's Land Development Agency), has appointed Cedar Woods as it's private sector partner to progress Phase 2 (Environmental and Planning Approvals) of this Proposal.

Name Marcus Deshon

Title Development Manager

Organisation Cedar Woods Properties Ltd

ACN / ABN (if applicable) 47 009 259 081

Postal address PO BOX 66 Kings Park Road, WEST PERTH 6872

Telephone (08) 9480 1500

Email marcus.deshon@cedarwoods.com.au

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.

Signature



Date 21/9/2010

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name Lisa Adams

Title Principal

ACN / ABN (if applicable) 32 056 190 419

Postal address PO BOX 383 LEEDERVILLE WA 6903

Telephone (08) 9228 6900

Email l.adams@strategen.com.au

Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature

L Adams

Date

21/9/10

REFERRAL CHECKLIST

HAVE YOU:

- Completed all required sections of the referral form?
- Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- Provided a map showing the location and approximate boundaries of the project area?
- Provided a map/plan showing the location of the action in relation to any matters of NES?
- Provided complete contact details and signed the form?
- Provided copies of any documents referenced in the referral form?
- Ensured that all attachments are less than two megabytes (2mb)?
- Sent the referral to the Department (electronic and hard copy preferred)?