

Advice on areas of conservation significance in the Preston Industrial Park

**Advice of the Environmental Protection Authority to the Minister for the
Environment under Section 16(e) of the *Environmental Protection Act 1986***

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Executive Summary

This report provides the Environmental Protection Authority's (EPA's) advice to the Minister for the Environment under section 16(e) of the *Environmental Protection Act 1986* on the areas of conservation significance within the area identified by the Western Australian Planning Commission (WAPC) for the future development of the Preston Industrial Park. The Preston Industrial Park is approximately 2950 hectares (ha) in area, and is situated approximately 4 kilometres (km) east of the Bunbury Central Business District, within the municipalities of the City of Bunbury and the Shire of Dardanup.

The Preston Industrial Park has been identified as an industrial area in strategic planning documents, most recently in *Industry 2030-Greater Bunbury Industrial Land and Port Access Planning* (WAPC 2000) which contains an *Interim Strategy Plan* for the area pending the completion of further technical investigations.

The Department for Planning and Infrastructure (DPI), on behalf of the WAPC is currently undertaking a review of the *Industry 2030 – Preston Industrial Park Interim Strategy Plan* with a view to developing a Structure Plan for the area to guide and facilitate appropriate land use zoning and development.

A formal request was made by the Minister for the Environment requesting strategic advice from the EPA on the areas of native vegetation to be retained in the Preston Industrial Park Area, and if required, other environmental matters to be addressed in subsequent planning stages.

In preparing its advice the EPA has taken into account the *Preston Industrial Park – Environmental Study* (Connell Wagner and Ecoscape 2007) commissioned by the DPI in addition to, other biological studies in the area, advice of the Department of Environment and Conservation, site visits and investigations.

The Preston Industrial Park Area has been divided in 25 Investigation Areas. Investigation Areas were delineated by considering the draft remnant vegetation mapping from Swan Bioplan and areas defined in Connell Wagner and Ecoscape 2007, to include all natural areas with bushland of 'Good' or better condition on the Keighery condition scale (Government of Western Australia 2000).

In considering the areas of native vegetation to be retained within the Preston Industrial Park, the EPA has applied the *Strategy to Identify Regionally Significant Natural Areas* as outlined in Guidance Statement No.10 (EPA 2006a) and Bulletin 1108 Greater Bunbury Region Scheme (EPA 2003a). This has included the consideration of:

1. Native Vegetation and Flora;
2. Native Fauna;
3. Wetlands and Waterways (Preston and Ferguson Rivers); and
4. Ecological Linkage.

A natural area assessment sheet has been completed for each Investigation Area to assess them against the EPA's criteria for regional significance.

The EPA has used these assessments to formulate strategic recommendations which provide for the protection of priority areas of regional conservation significance. Further to this the EPA has made recommendations for a series of natural areas in the Preston Industrial Park for the purpose of enhancing and restoring ecological linkage.

The recommendations are divided into several categories. The categories acknowledge subsequent planning approvals processes that apply to the future development of the Preston Industrial Park which can provide for conservation and management. The categories are:

Conservation

The EPA recommends that regionally significant natural areas of highest conservation value are retained as Regional Open Space as a future amendment to the Greater Bunbury Region Scheme and appropriately managed for conservation purposes.

Subdivision/Rezoning Protection

The EPA recommends that regionally significant areas of high conservation value that due to their size, shape, location or isolation can be adequately protected and retained as part of any future rezoning, subdivision or development whichever comes first.

Linkage – Enhancement or Restoration

The EPA recommends that the enhancement and restoration areas as identified in strategic locations between the Conservation and Subdivision/Rezoning Protection Areas be restored and/or enhanced to contribute to regionally significant ecological linkage. Opportunities should be explored through future rezoning, subdivision or development, including the implementation of other developments where offsets may be required, or conservation initiatives targeting the restoration and/or enhancement of these areas.

The EPA has also identified environmental matters which will require further consideration during subsequent statutory planning processes (i.e. structure planning, town planning schemes, subdivision and development proposals) so the environment will be adequately protected. These include:

1. Wetland Buffers;
2. Air Quality;
3. Noise;
4. Water Quality and Quantity;
5. Flood Way Mapping;
6. Acid Sulfate Soils;
7. Solid and Liquid Waste Disposal;
8. Risk;
9. The requirement for construction materials; and
10. Development Priority.

The EPA will also use the advice provided in this report when assessing subsequent statutory planning instruments such as town planning schemes and development proposals.

With respect to future development for the PIP, the EPA expects that a development footprint that complies with the advice in this report is not likely to require formal assessment of native vegetation and flora, native fauna, wetlands, waterways or ecological linkage in the foreseeable future. However, the EPA retains the ability under the *Environmental Protection Act 1986* to assess any amendments or proposals that may have a significant impact on the environment.

Finally the EPA commends the WAPC and DPI on its strategic and proactive approach to the consideration of environmental matters in its overall planning for the Preston Industrial Park.

Summary of recommendations

The EPA's recommendations are based on the future land use of the area for industrial land use purposes. The EPA's recommendations are in recognition of the environmental values of the area and it is the EPA's expectation that areas with significant environmental values will be retained as part of future planning for the Preston Industrial Park.

The EPA recommends that:

- 1. All remnant vegetation within the Preston Industrial Park is considered to be regionally significant and should be retained.**
- 2. The vegetation in its entirety within Recommendation Areas A,B,C, D and E (Figure 6) be reserved as Regional Open Space in a future amendment to the GBRS and appropriately managed.**
- 3. That vegetation in its entirety within Recommendation Areas F,G, H, I, J, and K (Figure 6) be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.**
- 4. Connectivity be enhanced in Recommendation Areas L, M, N, P and U (Figure 6) and restored in Areas Q, R & S (Figure 6) given the fragmented distribution of the remaining natural areas in the study area and the negative impact this has on long term viability in a changing climate.**
- 5. Appropriate buffers for wetlands be determined based on the values of the wetlands and proposed land uses, and protected and appropriately managed as part of any future rezoning, subdivision or development, whichever comes first.**
- 6. That the Minister note the Advice Provided in Section 10 on environmental matters that will require further consideration as part of future planning processes.**

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1. Introduction

The primary purpose of this Environmental Protection Authority (EPA) report is to provide advice to the Minister for the Environment under Section 16(e) of the *Environmental Protection Act 1986* (EP Act) on the areas of native vegetation to be retained within the proposed Preston Industrial Park (PIP) an area identified to provide a long term supply of industrial land east of the Bunbury Central Business District.

It should be noted that advice under Section 16 of the EP Act does not constitute a formal assessment or approval by the EPA. The purpose of the advice is to provide independent guidance on environmental issues to the Minister for the Environment at a stage when formal assessment by the EPA under Part IV of the EP Act is not possible. There is no right of appeal against Section 16 advice.

The project is to develop a Structure Plan for the area identified as the PIP to guide and facilitate appropriate land use zoning and development. The EPA's advice will enable the Western Australian Planning Commission (WAPC) to incorporate appropriate responses to the environmental factors into the Structure Plan and at subsequent stages of planning and development for the area. The EPA's advice is also available to the public so it may be considered by the general community, industry, State and Local Government, and other stakeholders.

The Preston locality was first identified as a long term industrial area in the *Bunbury Wellington Region Plan* (WAPC 1995). The State Government commissioned further studies to ensure suitable well located and well planned industrial estates and transport routes for Greater Bunbury. These studies were summarised in *Industry 2030-Greater Bunbury Industrial Land and Port Access Planning* (referred to below as *Industry 2030*) which was released by the WAPC for public comment in May 1998. *Industry 2030* included consideration of the PIP.

Following release of *Industry 2030* for public comment the EPA made a submission to the WAPC in August 1998 (Bulletin 902) under Section 16(j) of the EP Act. The EPA's 1998 advice in relation to the PIP is outlined in Section 3 below.

The Final *Industry 2030-Greater Bunbury Industrial Land and Port Access Planning* was released by the WAPC in April 2000. This document contained an *Interim Strategy Plan* for the PIP pending the completion of further technical investigations.

The Department for Planning and Infrastructure (DPI), on behalf of the WAPC is currently undertaking a review of the *Industry 2030 – Preston Industrial Park Interim Strategy Plan*. In undertaking this review the DPI formed a Technical Advisory Group (TAG) to assist the DPI in undertaking the outstanding technical investigations, and to develop a Structure Plan which will provide the planning framework within which land use and development decisions can be made.

The WAPC requested that the Minister for the Environment seek advice from the EPA to assist them in the development of the Structure Plan. The Minister for the Environment subsequently requested strategic advice from the EPA on the areas of

native vegetation to be retained and if required, other environmental matters to be addressed in subsequent planning stages.

The first stage strategic assessment involves the EPA providing Section 16(e) advice to the Minister for Environment. The advice is based on consideration of the relevant significant environmental factors affecting the project, the areas of conservation significance within the PIP and other advice that will assist the WAPC through future stages of the planning process.

Once the EPA's strategic advice is received, the WAPC and DPI will consider this advice in the formulation of a Structure Plan which will ultimately be used to guide and facilitate appropriate land use zoning and development. The EPA has requested that the WAPC submit the draft Structure Plan to the EPA for advice prior to its finalisation. The second stage environmental assessment is expected to be referred to the EPA under S48A of the EP Act where amendments to the Region Scheme and Local or Town Planning Schemes will be required or under S38 for development proposals or applications where appropriate. A flow chart that depicts the process is provided below in Figure 1.

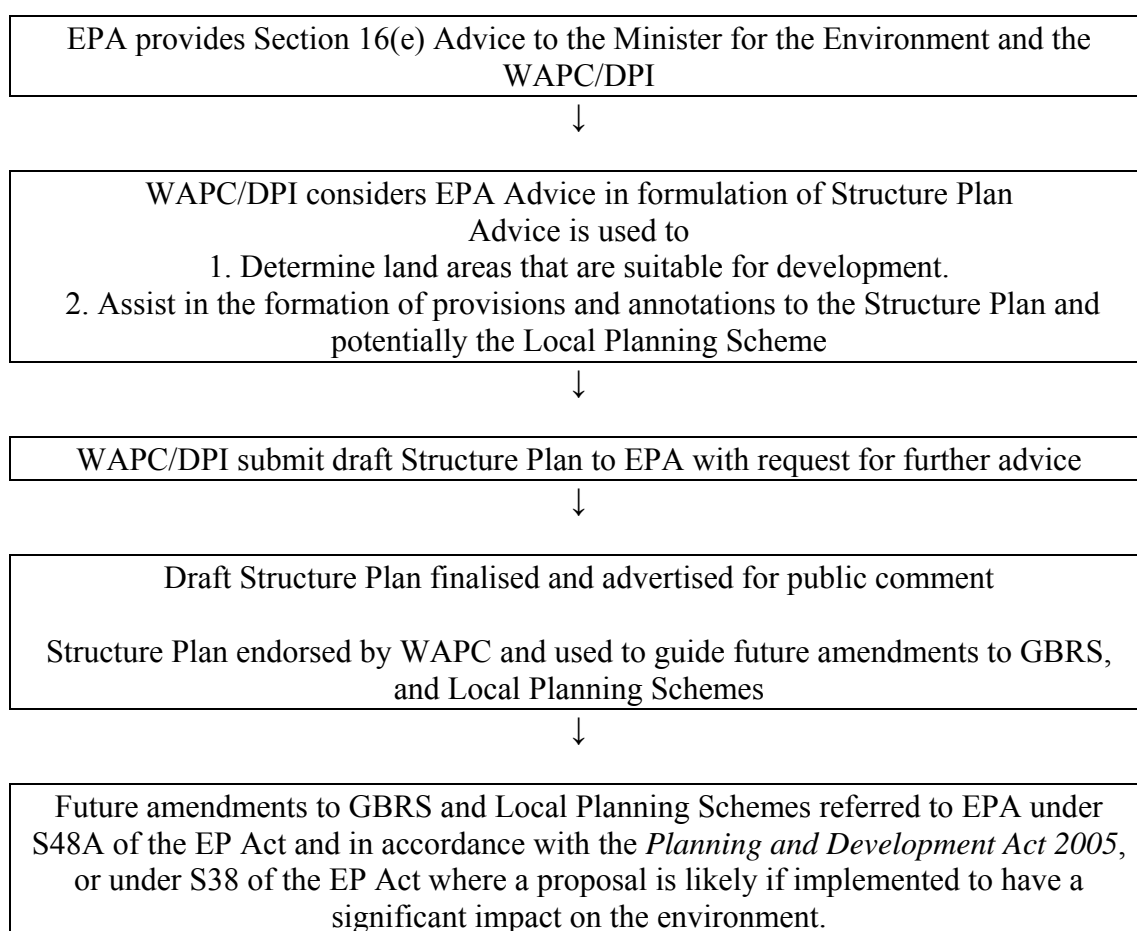


Figure 1: Process for EPA input into the PIP planning process

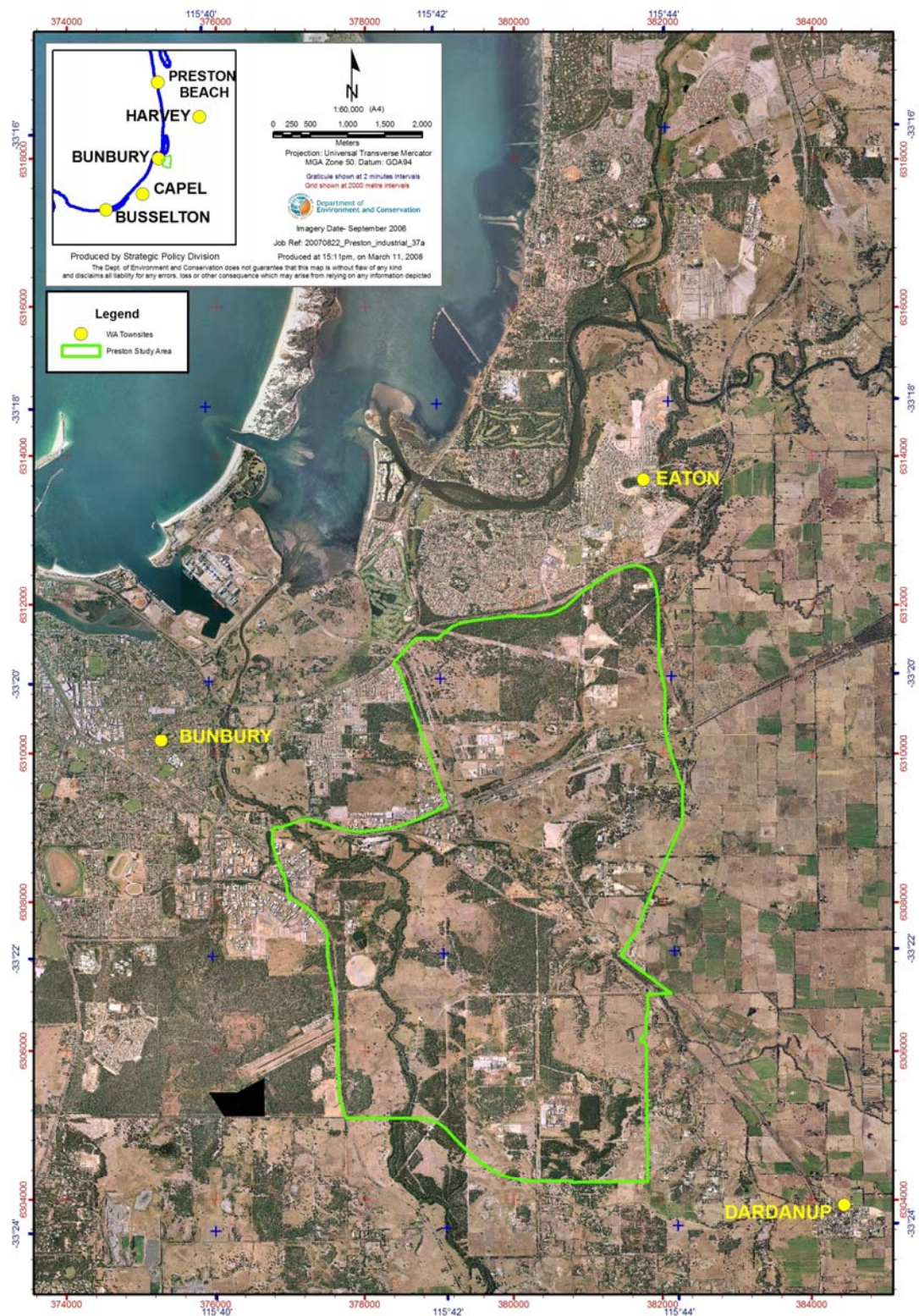


Figure 2. Location of the Preston Industrial Park

2. The Project

The project is to develop a Structure Plan for the area identified as the PIP to guide and facilitate appropriate land use, zoning and development.

The PIP, is approximately 2950 hectares (ha) in area and is situated approximately 4 kilometres (km) east of the Bunbury Central Business District, within the municipalities of the City of Bunbury and the Shire of Dardanup and the localities of Picton, Davenport and Preston (Figure 2). The PIP is bounded by the Australind Bypass, the future Bunbury Bypass, the South Western Highway and extends south to the border of the Coppystone special residential area.

There are established general and light industrial uses already operating in the PIP area in addition to rural uses, housing land and a number of other uses under both Government and freehold ownership.

3. History of Planning and Environmental Studies in Preston Industrial Park

The Preston locality was first identified as a long term industrial area in the *Bunbury Wellington Region Plan* (WAPC 1995). In May 1998 the WAPC released *Industry 2030-Greater Bunbury Industrial Land and Port Access Planning* for public comment (referred to below as *Industry 2030*). This document contained a summary of studies commissioned by the State Government to ensure suitable well located and well planned industrial estates and transport routes for Greater Bunbury. *Industry 2030* included an outline of the proposed PIP, an established industrial area which contains general and light industry together with rural land, housing and a range of other uses (WAPC 1998). The outline in *Industry 2030* was based on the *Preston Industrial Park Land Use and Port Access Study* (Feilman Planning Consultants *et al.*1997) which provided a Strategy Plan for the area supporting the use of the area for both general and light industry.

Following release of *Industry 2030* for public comment the EPA provided advice to the WAPC in Bulletin 902 (EPA 1998) under Section 16(j) of the *Environmental Protection Act 1986*. The intent of the EPA's advice was to:

- a) identify the environmental matters which require the draft recommendations in *Industry 2030* to be modified prior to finalisation; and
- b) identify the environmental matters which will require further consideration during subsequent statutory planning processes so the environment will be adequately protected (EPA 1998).

The EPA also indicated that this advice would be used in the assessment of subsequent statutory planning processes.

In Bulletin 902 the EPA identified the main environmental issues raised by the Preston Industrial Park as:

- Buffer requirements for noise, air quality and risk;
- Protecting regionally significant wetlands, watercourses and vegetation;
- Maintaining a sustainable groundwater balance;
- Protecting water quality in the Preston and Ferguson Rivers; and
- Solid and liquid waste disposal (EPA 1998).

In relation to the *Preston Industrial Park Land Use Port Access Study* (Feilman Planning Consultants *et al.* 1997) the EPA advised that the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP Lakes), watercourses and their associated vegetation should be protected with appropriate separation from industrial development in order to adequately protect the environment (EPA 1998).

The EPA also advised that:

- modelling in accordance with the EPA's criteria is required to demonstrate that the strategy plan for the Preston industrial area can accommodate the appropriate buffer requirements for noise, air quality and risk; and
- criteria for water management and drainage management should be adopted by Government as part of the assessment of the Bunbury Region Scheme. The criteria and drainage management should aim to protect water levels and water quality in significant wetlands and the Preston and Ferguson Rivers (EPA 1998).

In addition the EPA recommended that the following issues be deferred for assessment at the subsequent statutory planning stages:

- subsequent planning instruments should adequately protect and also prevent incompatible land uses from locating near the EPP Lakes and watercourses;
- there are several areas of intact remnant vegetation that should be assessed by the EPA to determine their conservation value prior to the land being rezoned in the town planning scheme. A vegetation survey would be required as part of this assessment; and
- the magnitude of solid and liquid waste generated at PIP should be estimated and details of where the waste will be disposed and how it will be managed should be considered as part of the review for the Bunbury Region Scheme (EPA 1998).

After consideration of the submissions received during the public consultation period, including the EPA's Section 16(j) advice, the final version of *Industry 2030-Greater Bunbury Industrial Land and Port Access Planning* was released by the WAPC in April 2000. The document contains an *Interim Strategy Plan* for the PIP which was intended to be an indicative plan pending the completion of a number of technical investigations, including the following environmental studies:

- a) Environmental impact modelling in accordance with the EPA's criteria is required to demonstrate that the strategy plan for the Preston industrial area can accommodate the appropriate buffer requirements for noise, air quality and risk.
- b) A comprehensive water and drainage management strategy (which specifically addresses coordination and implementation issues and clarifies flooding risk in the Ferguson Basin).
- c) A detailed vegetation survey.

- d) A detailed survey of wetlands.
- e) A more thorough investigation of liquid waste disposal (WAPC 2000).

The DPI, on behalf of the WAPC, has been undertaking a review of the *Preston Industrial Park Interim Strategy Plan* with a view to preparing a final Structure Plan to provide the planning framework within which land use and development decisions can be made. The review has included undertaking a number of the environmental technical studies listed above. The final Structure Plan will be dependent on the outcomes of these and other studies.

A Technical Advisory Group (TAG) comprising of Local and State Government agencies, and non government agencies, was formed to provide guidance on technical aspects, and to assist with the preparation of the Structure Plan. Representatives of the Department of Environment and Conservation (DEC) have been involved in the TAG since 2002.

A number of studies have been commissioned by the DPI to address the required technical investigations, including the *Preston Industrial Park Buffer Definition Study* (SKM 2004) and the *Preston Industrial Park Structure Plan: Water Resources and Vegetation Management Strategy* (ENV 2005). In July 2006 the DEC provided written advice in response to these studies. This advice addressed the issues of vegetation, flora, wetlands, air quality, noise, risk, stormwater and floodway mapping. Additionally, it included a scope of works for a further study to be undertaken in order to identify the regionally significant vegetation, and ecological linkages within the PIP.

The DPI commissioned Connell Wagner to undertake this study entitled the *Preston Industrial Park – Environmental Study* (Connell Wagner and Ecoscape 2007), which has now been finalised, and submitted to the EPA with the request from the Minister for the Environment for Section 16(e) advice on the areas of remnant vegetation to be retained in the PIP.

4. Policy Context

The Greater Bunbury Region Scheme (GBRS), prepared by the WAPC under the *Western Australian Planning Commission Act 1985*, defines the broad pattern of land use for the City of Bunbury and the Shires of Harvey, Dardanup and Capel. The GBRS was referred to the EPA, under Section 48A of the EP Act, in August 1996. The EPA deemed that the GBRS should be formally assessed and the EPA's report and recommendations on the GBRS (Bulletin 1108) was released in September 2003. The Minister for the Environment issued the environmental conditions (Statement No. 697) on 31 October 2005. The GBRS was tabled in Parliament on 17 October 2007 and came into effect in November 2007.

The PIP is located wholly within the GBRS, the current land use zoning under the GBRS is shown in Figure 3.

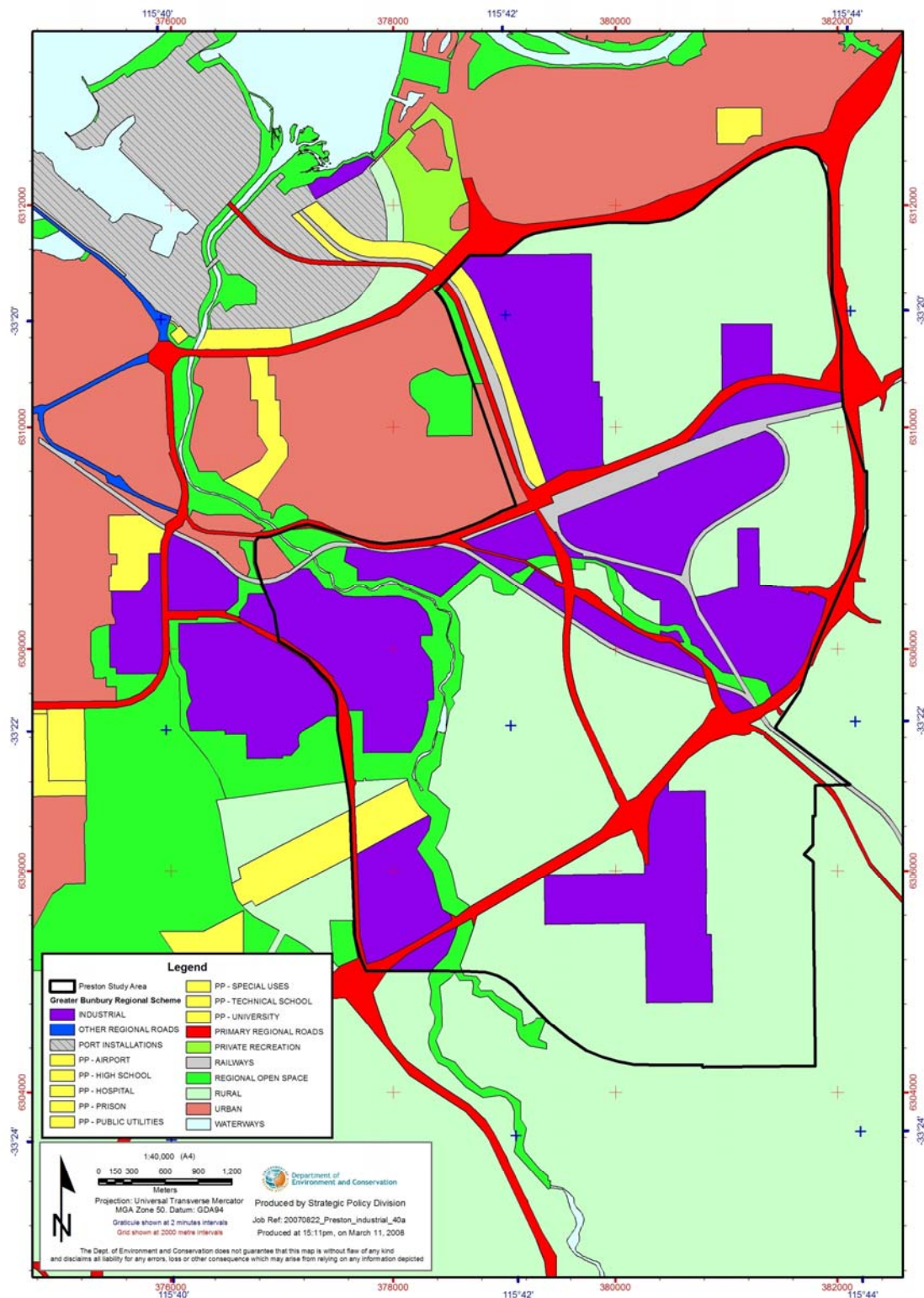


Figure 3. Greater Bunbury Region Scheme Zoning in the Preston Industrial Park

The EPA's assessment of the GBRS included specific consideration of the following areas within the PIP:

- Reserve 670 North Boyanup Road and the vegetated land to the north of this site;
- Lot 15 North Boyanup Road, Davenport;
- Lots 1 and Part Lot 5 North Boyanup Road, Davenport;
- Lots 8 and 10 Ferguson River Foreshore, Picton;
- Bunbury Outer Ring Road; and
- Port Access Road.

The EPA's recommendations in Bulletin 1108 in relation to these areas of land have been considered in the preparation of the advice to the Minister for the Environment contained in this Bulletin.

In addition to the assessment of regionally significant environmental issues raised by the new zones in the proposed GBRS, the EPA also provided advice on regionally significant environmental issues across the whole of the GBRS area. Of relevance to the PIP is the EPA's advice in relation to:

- a strategy to conserve regionally significant natural areas on the Swan Coastal Plain;
- wetland management;
- waterway management; and
- acid sulfate soils (EPA 2003a).

The EPA's assessment of the GBRS acknowledged that a number of environmental factors were not included in the assessment due to the broad scale of the assessment or because insufficient information was available. Accordingly, the EPA "deferred" these factors to ensure that a more detailed assessment of future local government scheme amendments, subdivisions or development proposals, whichever comes first, can be undertaken by the EPA under Part IV of the EP Act. These deferred factors included:

- 1) All rural zoned land in the GBRS.
Deferred Factors – remnant vegetation and wetlands.
- 2) All land in the GBRS.
Deferred Factor – site contamination.
- 3) Port Access Road.
Deferred Factors – remnant vegetation, wetland, watercourses, fauna and noise.
- 4) Reserve 670 North Boyanup Road, Davenport and the land to the north of this site.
Deferred Factors – remnant vegetation, fauna and ecological linkage.
- 5) Lot 15 North Boyanup Road.
Deferred Factors – remnant vegetation and fauna.
- 6) Bunbury Outer Ring Road.
Deferred Factors – remnant vegetation, wetland, watercourses, fauna and noise (EPA 2003a).

5. Assessment Methodology

In considering the GBRS in 2003 the EPA prepared a strategy for the identification of regionally significant natural areas. This Strategy measures an individual area's natural values against the selection criteria for the identification of regionally significant natural areas developed for System 6 and Part System 1 Update and the Bush Forever Project. In order to establish whether an area falls into this category it needs to be either part of the existing or proposed conservation system or to meet, in part or whole, a range of criteria which are outlined in this Strategy (EPA 2003a and 2006a). The selection criteria are:

- 1) representation of ecological communities;
- 2) diversity;
- 3) rarity;
- 4) maintaining ecological processes or natural systems;
- 5) scientific or evolutionary importance; and
- 6) general criteria for the protection of wetland, streamline, and estuarine fringing vegetation and coastal vegetation.

The first criterion, 'representation of ecological communities' requires consideration of all remaining areas of native vegetation. To encompass current recognised levels of remnant native vegetation retention, the Greater Bunbury Region strategy (EPA 2003a) used a standard level of native vegetation retention of at least 30% of the pre-clearing extent of the ecological communities on the Swan Coastal Plain. These levels are modified for the 'Greater Bunbury Region Constrained Area' of the Swan Coastal Plain, which focus on consolidated areas of urban, urban deferred and industrial zoned land, to seek to retain at least 10% of the pre-clearing extent of each ecological community (EPA 2003a).

The PIP area is located within the 'Constrained Area' as defined in the EPA's report and recommendations on the GBRS. The EPA's objective within the constrained area is to:

- retain at least 10% of the pre-clearing extent of the ecological community in the 'Constrained Area' of the Greater Bunbury Region where greater than 10% of the ecological community remains on the Swan Coastal Plain (the natural region); or
- retain all remaining areas of each ecological community in the 'Constrained Area' of the Greater Bunbury Region where 10% or less than 10% of this ecological community remains on the Swan Coastal Plain (EPA 2003a).

In the application of this strategy the following policy statements apply to the Greater Bunbury Region:

- the general protection of remnant native vegetation on the Swan Coastal Plain in the Greater Bunbury Region be achieved through the preferential location of developments in cleared areas;
- there is a presumption that all areas of remnant native vegetation containing Threatened Ecological Communities or vegetation of the major landform elements of which less than 10% currently remains on the Swan Coastal Plain will be retained and conserved in the Greater Bunbury Region; and

- that there be proactive planning for the restoration of ecological communities and landscape rehabilitation between and around selected sequences of the small remaining remnants on the eastern side of the Swan Coastal Plain in the Greater Bunbury Region (EPA 2003a).

In assessing the GBRS the EPA also broadly identified a series of preliminary regionally significant ecological linkages (Appendix 3). Of the two types of linkage identified being vegetated sequences and river corridors, several of these preliminary linkages transverse the PIP area, namely:

- McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage;
- Maidens/Preston River east-west ecological linkage (also known as the Ocean to Preston Link or Ocean to Preston River Park);
- Preston River ecological linkage (portion of Preston River in the City of Bunbury outside of the McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage); and
- Ferguson River, east-west ecological linkage.

6. Other EPA Assessments Relevant to this Advice

In addition to the assessment of the GBRS, the EPA has undertaken a number of other assessments pursuant to Section 38 and 48A of the EP Act which are located within the PIP. In preparing this advice the EPA has taken into account its previous decisions, advice, and report and recommendations in relation to these previous assessments. A table of these previous assessments is provided in Appendix 4, and where relevant to this assessment, have been discussed in Section 8 and 9 below.

The EPA's records also indicate that there are several areas within the PIP area which are currently zoned for industrial purposes where the rezoning occurred prior to the 1996 *Legislation Amendment Act*, and therefore have not been assessed by the EPA. These zonings are reflected in the GBRS, and in some cases, were not considered by the EPA in Bulletin 1108 which focused on new zonings or areas raised in submissions. It is particularly important there is adequate assessment and consideration of environmental issues undertaken in these areas, prior to any further development or subdivision.

7. Key Environmental Factors

It is the EPA's opinion that the following are the key environmental factors relevant to the Minister's request for advice on this PIP, which require detailed evaluation in this report:

1. Native Vegetation and Flora;
2. Native Fauna;
3. Wetlands and Waterways (Preston and Ferguson Rivers); and
4. Ecological Linkage.

The EPA has also identified other environmental factors which are relevant to the PIP and these are discussed further in Section 10.

7.1 Native Vegetation and Flora

The EPA's environmental objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge (EPA 2004b).

Of the 2950ha of the PIP approximately 980ha, or 33% of the area, is remnant vegetation.

7.1.1 Vegetation Complexes

The PIP contains vegetation of the Southern River, Swan, Guildford and Karrakatta Central and South complexes as mapped by Heddle *et al.* (1980). The EPA's Assessment of the GBRS indicated the areas and corresponding percentages of the original extent of these complexes remaining on the Swan Coastal Plain (Table 1) and within the Greater Bunbury Region (Table 2). This data is based on remnant vegetation mapping derived from 1998 aerial photography and has not been updated since the GBRS was assessed, and therefore should be considered as conservative figures for what presently remains and is protected.

All four Vegetation Complexes present in the PIP are below the target level of native vegetation retention of at least 30% of the pre-clearing extent of the ecological communities on the Swan Coastal Plain.

Table 1: Native vegetation on the Swan Coastal Plain (SCP) for those vegetation complexes found in the PIP.

Vegetation Complex	SCP				
	Original Area (ha)	Remains		Protected	
		Area (ha)	% of original	Area (ha)	% of original
Southern River	57979	11501	19.8	882	1.5
Swan	15783	2454	15.6	0	0
Guildford	92497	4662	5.0	143	0.2
Karrakatta Central and South	51620	14811	28.7	1256	2.4

Original = Pre-clearing (1750) extent derived using Heddle *et al.* (1980).

Remains = Remaining area in 1997/98 as mapped by Beeston *et al.* (2001).

Protected = National Parks, Nature Reserves, Conservation Parks and 5(g) Reserves

Table 2: Native vegetation in the Greater Bunbury Region (GBR) and the GBR Constrained Area within those vegetation complexes found in the PIP.

Vegetation Complex	GBR					GBR Constrained Area				
	Original	Remains		Protected		Original	Remains		Protected	
	Area (ha)	Area (ha)	% of original	Area (ha)	% of original	Area (ha)	Area (ha)	% of original	Area (ha)	% of original
Southern River	16070	3320	20.7	631	3.9	3862	1247	32.3	292	7.6
Swan	5646	917	16.0	164	2.9	917	196	21.4	116	12.6
Guildford	33294	1470	4.4	121	0.4	572	75	13.2	2	0.4
Karrakatta Central and South	11686	6091	52.1	1587	13.6	3040	1617	53.2	336	11.0

Original = Pre-clearing (1750) extent derived using Heddle *et al.* (1980).

Remains = Remaining area in 1997/98 as mapped by Beeston *et al.* (2001).

Protected = Regional Open Space reserves of the GBRS after WAPC (2000).

Vegetation within the Guildford complex is below the 10% threshold in the GBR Constrained Area on the Swan Coastal Plain. As described above, the EPA's objective in the 'Constrained Area' of the Greater Bunbury Region is to retain all remaining areas of each ecological community where 10% or less than 10% of this ecological community remains on the Swan Coastal Plain.

The majority of the study area is Southern River complex. 20.7% of the original extent of this complex remains in the Greater Bunbury Region. 3.9% of the original extent in the GBRS is protected in secure tenure for conservation purposes. The aim is to seek to retain at least 10% of the original extent of the complex (EPA 2003a). The current Regional Open Space (ROS) reservations under the GBRS will not protect enough to meet the target of 10% and therefore securing this vegetation type in reserves is a priority. The PIP represents an opportunity to contribute to achieving the target representation.

16% of the original extent of the Swan complex, also present in the study area, remains within the Greater Bunbury Region. 2.9% of the original extent in the GBRS is protected in secure tenure for conservation purposes. 21.4% of the original extent remains in the 'Constrained Area'. Whilst 12.6% of the original extent in the 'Constrained Area' is protected in secure tenure, the GBRS will not protect enough to meet the target of 10% for the Greater Bunbury Region. Therefore, securing this vegetation type in reserves is a priority. The PIP represents an opportunity to contribute to achieving the target representation for the Greater Bunbury Region.

Only a small area of Karrakatta Central and South complex occurs within the PIP, in the extreme north-west. However, it is significant because this area represents one of few locations where remnant vegetation occurs at the transition between the Spearwood and Bassendean Dunes with the Pinjarra Plain.

Representation of Ecological Communities is only one of the six criteria used in assessing the natural values of an area.

7.1.2 Diversity of Vegetation and Flora

The PIP is an area of high biodiversity and contains over 40 vegetation units in six floristic community types, including both upland and wetland units. Over 350 species of native flora have been recorded from 66 plant families.

7.1.3 Vegetation condition

Most of the bushland in the PIP has been subjected to historic timber cutting and grazing. In addition, weed movement has been facilitated by the two rivers that dominate the area. Despite this, the majority of the remnant vegetation in the PIP is in 'Good' or better condition on the Keighery condition scale (Government of Western Australia 2000), in addition to areas in 'Excellent' condition.

7.1.4 Flora of conservation significance

The EPA (2004a) defines flora to be of conservation significance where they are listed under State or Commonwealth legislation, are listed by DEC as Priority flora, or are considered regionally significant for various reasons. In the PIP, flora were considered for regional significance based on:

- statutory list of Declared Rare Flora under State legislation (*Wildlife Conservation Act 1950*);
- statutory list of threatened flora under Commonwealth legislation (*Environment Protection and Biodiversity Conservation Act 1999*);
- list of Priority flora maintained by DEC (2008a) and listed on *Florabase* (Western Australian Herbarium 1998);
- reservation status as 'unreserved – taxa not known from any reserve' and 'very poorly reserved – taxa known from 1 or 2 reserves' as defined in Keighery (1999); and
- Swan Coastal Plain endemism as defined in Government of Western Australia (2000).

The native flora in the study area is moderately well understood based on consultants' reports conducted for the purposes of development proposals, surveys for the preparation of this advice by consultants and DEC, and on specific searches for rare flora undertaken by regional DEC officers. To date, 31 conservation significant flora have been recorded within the PIP (Table 3). This includes one listed as Declared Rare under the State *Wildlife Conservation Act 1950* and as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*, seven listed as Priority flora, twenty one poorly reserved in the SCP and two that are endemic to the SCP.

Table 3: Flora of conservation significance recorded in the PIP.

Taxa	Conservation significance in PIP	Reference
<i>Acacia flagelliformis</i>	P4, known from 2 reserves	2, 3
<i>Acacia pulchella</i> var. <i>goadbyi</i>	Unreserved	3
<i>Acacia urophylla</i>	Unreserved	3
<i>Anarthria prolifera</i>	Known from 2 reserves	3
<i>Aponogeton hexatepalus</i>	P4, known from 2 reserves	2, 3
<i>Boronia dichotoma</i>	Known from 2 reserves	3
<i>Caesia micrantha</i> (large swamp form)	Endemic to SCP	4
<i>Caladenia speciosa</i>	P4, known from 1 reserve	2
<i>Comespernum nudiusculum</i>	Unreserved	3
<i>Darwinia citriodora</i>	Known from 2 reserves	3
<i>Daviesia incrassata</i>	Known from 1 reserve	3
<i>Deyeuxia quadriseta</i>	Known from 2 reserves	3
<i>Diuris drummondii</i>	DRF	1
<i>Drosera macrantha</i> (Swan Coastal Plain form)	Endemic to SCP	4
<i>Drosera pulchella</i>	Known from 1 reserve	3
<i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	P4	2
<i>Juncus subsecundus</i>	Known from 1 reserve	3
<i>Lepidosperma striatum</i>	Known from 1 reserve	3
<i>Lepyrodia glauca</i>	Known from 1 reserve	3
<i>Loxocarya cinerea</i>	Unreserved	3
<i>Meeboldina scariosa</i>	Known from 2 reserves	3
<i>Patersonia umbrosa</i>	Known from 2 reserves	3
<i>Platysace filiformis</i>	Known from 2 reserves	3
<i>Pterostylis aspera</i>	Known from 2 reserves	3
<i>Pultenaea skinneri</i>	P4, known from 1 reserve	2, 3
<i>Scaevola pilosa</i>	Known from 1 reserve	3
<i>Siloxerus filifolius</i>	Known from 2 reserves	3
<i>Tetratheca setigera</i>	Known from 2 reserves	3
<i>Verticordia attenuata</i>	P3	2
<i>Villarsia submersa</i>	P4	2
<i>Xanthorrhoea gracilis</i>	Known from 1 reserve	3

References include *Wildlife Conservation (Rare Flora) Notice 2008* (Government of Western Australia 2008a) under the *Wildlife Conservation Act 1950*¹, *Florabase* 1998², *Keighery* (1999)³ and *Government of Western Australia* (2000)⁴.

The State's second largest known population of the Declared Rare Flora *Diuris drummondii* (Tall Donkey Orchid) has been recorded within Investigation Area 14 of the PIP by DEC regional officers (DEC 2007b). The only other population known to be larger occurs within a shire road verge in the Peel region.

Of the seven priority flora that have been recorded in the PIP, four are also known to be poorly reserved. This includes *Caladenia speciosa* (P4) which had only been recorded at Investigation Area 9 in previous surveys but was recorded within Investigation Area 11 by DEC (2007a).

All of the Flooded Gums in the study area are of the subspecies *Eucalyptus rudis* subsp. *cratyantha* (P 4).

7.1.5 Vegetation of conservation significance

The EPA (2004a) defines vegetation to be of conservation significance where it is listed under Commonwealth legislation or by the WA Minister for Environment as a Threatened Ecological Community (TEC) or considered regionally significant for a range of reasons.

No TECs are known to occur within the PIP. However while further floristic analysis is required to confirm this, it is likely that any TECs identified in the future would occur within the core conservation areas recommended in this report for retention (“conservation areas” or “subdivision/rezoning protection areas”).

In the PIP vegetation is considered to be of regional significance at vegetation complex level. The EPA has a target to retain all remaining areas of each complex where less than 30% remains on the SCP (EPA 2003a). The exception to this is within ‘Constrained Areas’ such as the GBR Constrained Area and the Perth Metropolitan Region, where the target is 10%. The PIP lies within the GBR ‘Constrained Area’, therefore all remaining areas of any complex where less than 10% remains is considered significant.

Of the four vegetation complexes within the PIP, the Guildford vegetation complex is considered of highest conservation significance because it falls below the 10% target for retention. However, all four of the vegetation complexes have less than 30% of their original extent remaining on the SCP (Table 1 in 7.1.1 above). Therefore all remaining vegetation within the PIP is in need of retention and some level of protection for the EPA’s target to be met.

7.2 Native Fauna

The EPA’s environmental objective for native fauna is to maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge (EPA 2004b).

The native fauna in the study area is largely dependent on the remaining bushland remnants that were once part of the vegetation continuum that covered the project area. Apart from some information on birds, there is little available detailed information on the assemblage of faunal species that occupy the bushland remnants in the study area. It is clear from studies elsewhere on the Swan Coastal Plain (e.g. (How and Dell 1993, 1994, 2000) that the fauna has particular habitat, area and spatial requirements, and responds poorly to the effects of fragmentation and its associated perturbations, such as fire, weeds and predators, with the populations of many species having declined significantly since European settlement.

Because the fauna has particular habitat and spatial requirements and responds poorly to the effects of fragmentation and its associated perturbations (such as fire, weeds and predators), it is therefore necessary to retain the maximum possible habitat network of remnants with appropriate linkages for fauna to persist in a disturbed and rapidly changing landscape. As stated by Saunders *et al.* (1991) the loss of a single

remnant could affect the capability of other remnants to maintain their functions and hence the likelihood of maintaining all their species. Conservation planning for fauna also needs to allow for future changes. This is particularly so in regard to climate change. Studies all over the world (briefly reviewed by Low 2007) show that plants given more carbon dioxide produce less-nutritious leaves because they are lower in nitrogen and other elemental nutrients in proportion to carbon content. As nitrogen is a key nutrient for leaf-eating insects it is a major determinant of insect abundance. Any reduction of insect abundance will further reduce the ability of dietary specialised sedentary species, especially insectivorous birds, to persist in any given area. Negative impacts as a result of climate change affecting the persistence of fauna can be ameliorated by maximising the size of retained bushland in the area and ensuring that the diverse and representative range of native vegetation communities are adequately connected by appropriate ecological linkages.

Some vertebrate (Table 4) and invertebrate species inhabiting the study area are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and /or the State *Wildlife Conservation Act 1950* or are listed as Priority fauna by DEC because of limited distribution, few populations or regional declines. Other species in the PIP area, particularly some birds and reptiles, are of regional conservation significance because they have undergone major status reductions or distributional reductions in the PIP area and more widely on the Swan Coastal Plain (Government of WA 2000). Wetlands throughout the PIP area are also likely to be of regional significance for waterbirds.

Table 4: Conservation significant vertebrate fauna recorded in the Preston Industrial study area. For records in individual Investigation Areas see Appendix 5

KEY

Conservation Significance

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (DEH 2005)
 - E = Endangered
 - VU = Vulnerable
 - I = Internationally Protected Migratory Species
- *Wildlife Conservation (Specially Protected Fauna) Notice 2008* (Government of Western Australia 2008b)
 - R1 Schedule 1 — being fauna that is rare or likely to become extinct.
 - R2 Schedule 2 — being fauna that is presumed to be extinct.
 - R3 Schedule 3 — being birds that are protected under an international agreement.
 - R4 Schedule 4 — being fauna that is in need of special protection otherwise than for the reasons mentioned under Schedules 1, 2 and 3.
- CALM Priority Fauna List (DEC 2008b)
 - P1 Priority One — Taxa with few, poorly known populations on threatened lands.
 - P2 Priority Two — Taxa with few, poorly known populations on conservation lands.
 - P3 Priority Three — Taxa with several, poorly known populations, some on conservation lands.
 - P4 Priority Four — Taxa in need of monitoring.
 - P5 Priority Five — Taxa in need of monitoring.
- Regionally declining species (Government of Western Australia 2000)
 - Category 3 = habitat specialists with a reduced distribution on the Swan Coastal Plain and the Preston Industrial Area.
 - Category 4 = wide-ranging species with reduced populations on the Swan Coastal Plain and the Preston Industrial Area.

Scientific Name	Common Name	Conservation Significance
Order FALCONIFORMES		
Family ACCIPITRIDAE		
<i>Accipiter fasciatus</i>	Brown Goshawk	Category 4
<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Category 4
<i>Aquila audax</i>	Wedge-tailed Eagle	Category 4
<i>Aquila morphnoides</i>	Little Eagle	Category 4
Order GRUIFORMES		
Family RALLIDAE		
<i>Porphyrio porphyrio</i>	Purple Swamphen	Category 3
Order COLUMBIFORMES		
Family COLUMBIDAE		
<i>Phaps chalcoptera</i>	Common Bronzewing	Category 3
Order PSITTACIFORMES		
Family PSITTACIDAE		
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black Cockatoo	R1, Category 3
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo	E, R1, Category 4
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoo	VU, R1, Category 4
<i>Platycercus icterotis</i>	Western Rosella	Category 4
Order PASSERIFORMES		
Family MALURIDAE		
<i>Malurus splendens</i>	Splendid Fairy-wren	Category 3
Family ACANTHIZIDAE		
<i>Sericornis frontalis</i>	White-browed Scrubwren	Category 3
<i>Smicrornis brevirostris</i>	Weebill	Category 3
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	Category 3
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Category 3
Family MELIPHAGIDAE		
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Category 4
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	Category 4
<i>Phylidonyris melanops</i>	Tawny-crowned Honeyeater	Category 4
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	Category 4
Family PETROICIDAE		
<i>Petroica multicolor</i>	Scarlet Robin	Category 3
<i>Eopsaltria australis</i>	Yellow Robin	Category 3
Family PACHYCEPHALIDAE		
<i>Pachycephala pectoralis</i>	Golden Whistler	Category 3
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Category 3
Family ARTAMIDAE		
<i>Artamus cinereus</i>	Black-faced Woodswallow	Category 4
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Category 4
MAMMALS		
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	R1 VU
<i>Isodon obesulus</i>	Quenda	P5

7.2.1 Mammals

Prior to European settlement, thirty three species of native mammals were known from the Swan Coastal Plain (How and Dell 1993, Western Australian Museum 2003-). Of these, approximately twenty two were known to have occurred in the region of the study area (Western Australian Museum 2003-). Surveys are required to determine which mammal species still occur in the study area. Limited surveys (Appendix 5) have recorded only four species: namely Western Grey Kangaroo, Western Ringtail Possum, Common Brushtail Possum, and Quenda (Southern Brown Bandicoot). The threatened Western Ringtail Possum has significant populations in the study area and was recorded in 14 remnants (Appendix 5). This indicates that connectivity of remnants by ecological linkages is likely to be significant in maintaining this species in the event of severe disturbances.

The Western Ringtail Possum is currently listed on Schedule 1 of the *Wildlife Conservation Act 1950* as fauna that is rare or likely to become extinct, and “vulnerable” under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Major threats to the Western Ringtail Possum include habitat loss and fragmentation.

The Quenda or Southern Brown Bandicoot, is currently listed on the DEC’s Priority Fauna list as a Priority 5 (Taxa in need of monitoring). They are also listed as Conservation Dependent by the Threatened Species Consultative Committee.

7.2.2 Birds

Birds are the best known documented vertebrate group in the PIP area. While Storr and Johnstone (1988) listed 311 species of birds recorded from the Swan Coastal Plain and adjacent seas, the number of species actually occurring in the PIP area is incompletely known as there have been no comprehensive surveys. Results of recent surveys listed in Appendix 5 indicate that least 68 species have been recorded in the PIP area.

As discussed in *Bush Forever* (Government of WA 2000), many non-passerine species have decreased in number on the Coastal Plain since European settlement. Some of the waterfowl species and most of the occupants of the lake and swamp edges have suffered serious reductions as these habitats have been cleared or altered. Ducks such as the Freckled Duck, the Australasian Shoveler and Hardhead, the Little, Black and Australasian Bitterns, and the Dusky Moorhen have declined seriously. Birds of prey, including the Square-tailed Kite, Whistling Kite, Brown Falcon, Brown Goshawk and Collared Sparrowhawk, and habitat-specialist species like the Painted Button-quail and Brush Bronzewing, have declined with habitat removal.

Similarly, nearly half of the passerine bird species have decreased in abundance on the Coastal Plain since European settlement. Nearly all of the insectivorous and nectarivorous species have declined as a direct result of the clearing of the natural vegetation. Some of these species are scarce in many parts of the region, and in the PIP area are dependent on the surviving vegetation remnants. These species include

the Western Yellow Robin, Scarlet Robin, Golden Whistler, Grey Shrike-thrush, Weebill, Broad-tailed and Yellow-rumped Thornbills, White-browed Scrubwren, Splendid Fairy-wren, Varied Sittella, Tawny-crowned, Western White-naped, New Holland and White-cheeked Honeyeaters, and Black-faced and Dusky Woodswallow. Most of the above still have more continuous populations in the adjacent Darling Scarp and/or Darling Plateau.

The presence of the above significant species in particular remnant areas is indicated in Appendix 5.

The PIP contains all three of the cockatoo species endemic to Western Australia, namely the Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, and Baudin's Black Cockatoo.

The Carnaby's Black Cockatoo is listed under Schedule 1 of the Western Australian *Wildlife Conservation Act 1950* as fauna that is rare or likely to become extinct, "endangered" under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and is ranked as endangered by the Threatened Species Consultative Committee.

The Baudin's Black Cockatoo is listed under Schedule 1 of the *Wildlife Conservation Act 1950* as fauna that is rare or likely to become extinct, "vulnerable" under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and is currently ranked as endangered by the Threatened Species Consultative Committee.

The Red-tailed Black Cockatoo is listed under Schedule 1 of the *Wildlife Conservation Act 1950* as fauna that is rare or likely to become extinct, and is currently ranked as vulnerable by the Threatened Species Consultative Committee.

7.2.3 Reptiles

The herpetofauna of the PIP area is relatively poorly known compared to elsewhere on the Swan Coastal Plain where there have been numerous studies, as listed in How and Dell (2000). These studies have resulted in a detailed knowledge of the pattern of distribution in other areas, which allows some understanding of the likely patterning in the PIP area. The reptile fauna in the PIP area consists of at least forty five species (Western Australian Museum 2003-).

Of the reptiles likely to be found in the PIP area, one Carpet Python, is included in Schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008* (Government of Western Australia 2008b). In addition, other reptiles that occur or may still occur within the PIP area have been identified as regionally declining species including Barking Gecko, *Underwoodisaurus milii*, South-western Odd-striped Ctenotus, *Ctenotus impar*, Jewelled Ctenotus, *Ctenotus gemmula*, Red-legged Ctenotus, *Ctenotus labillardieri*, and Rosenberg's Monitor, *Varanus rosenbergii*. Some species are likely to have been naturally scarce or rare in the PIP area and others are likely to have suffered significant declines as a consequence of habitat loss. Further surveys would be required to determine the current status of reptile species within the PIP area.

7.2.4 Amphibians

Eleven species of amphibians, representing two families and seven genera (Western Australian Museum 2003-) are known from the region of the PIP area. Wetlands which have a good assemblage of breeding species and high population levels should be regarded as significant habitats because of population declines in other parts of the Swan Coastal Plain. Frogs are abundant in some parts of the PIP area because of the presence of swamps. Appendix 5 lists those remnants where different species of frogs have been recorded. However there is little information on the changes in abundance or local distribution of amphibians since European settlement and extensive replacement of natural ecosystems with agricultural ones would have markedly reduced the habitat available for many species. Current and future threats, including the Chytrid fungus, pollutants, and climate change, are likely to cause further population declines.

7.2.5 Invertebrates

Invertebrates are a major, essential and abundant component of faunal assemblages but little information is available on the PIP area. Although invertebrate species that are listed under Schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008* (Government of Western Australia 2008b) as 'fauna that is rare or likely to become extinct' or have been listed as 'Priority' species by DEC are known from other parts of the Coastal Plain, no surveys have been conducted in the PIP area.

7.3 Wetlands and Waterways

The EPA's environmental objectives for this factor are to:

- maintain the integrity, ecological functions and environmental values of waterways (EPA 2004g);
- protect the environmental quality of wetland ecosystems; and to have as an aspirational goal, no net loss of wetland values and functions; and
- maintain the abundance, diversity, geographic distribution and productivity of flora at the species and ecosystem levels through the avoidance or management of adverse impacts and through improvement in knowledge (EPA 2004d).

The proposed PIP contains two major waterways: the Preston River situated at the east of the site flowing in a northerly direction; and the Ferguson River following in a westerly direction, adjacent to the southwest highway. The confluence of the Preston and Ferguson Rivers occurs within the study area and continues on to the Leschenault Estuary.

The PIP contains ten wetlands identified as Conservation Category Wetlands (CCW), and six Resource Enhancement Wetlands (REW) as identified on the DEC's *Geomorphic Wetlands Swan Coastal Plain dataset* (2007c) (Figure 4). The majority of the remainder of the PIP is identified as a Multiple Use Wetland. In addition the PIP contains four wetlands recognised under the *Environmental Protection (Swan Coastal Lakes) Policy 1992* (EPP Lakes).

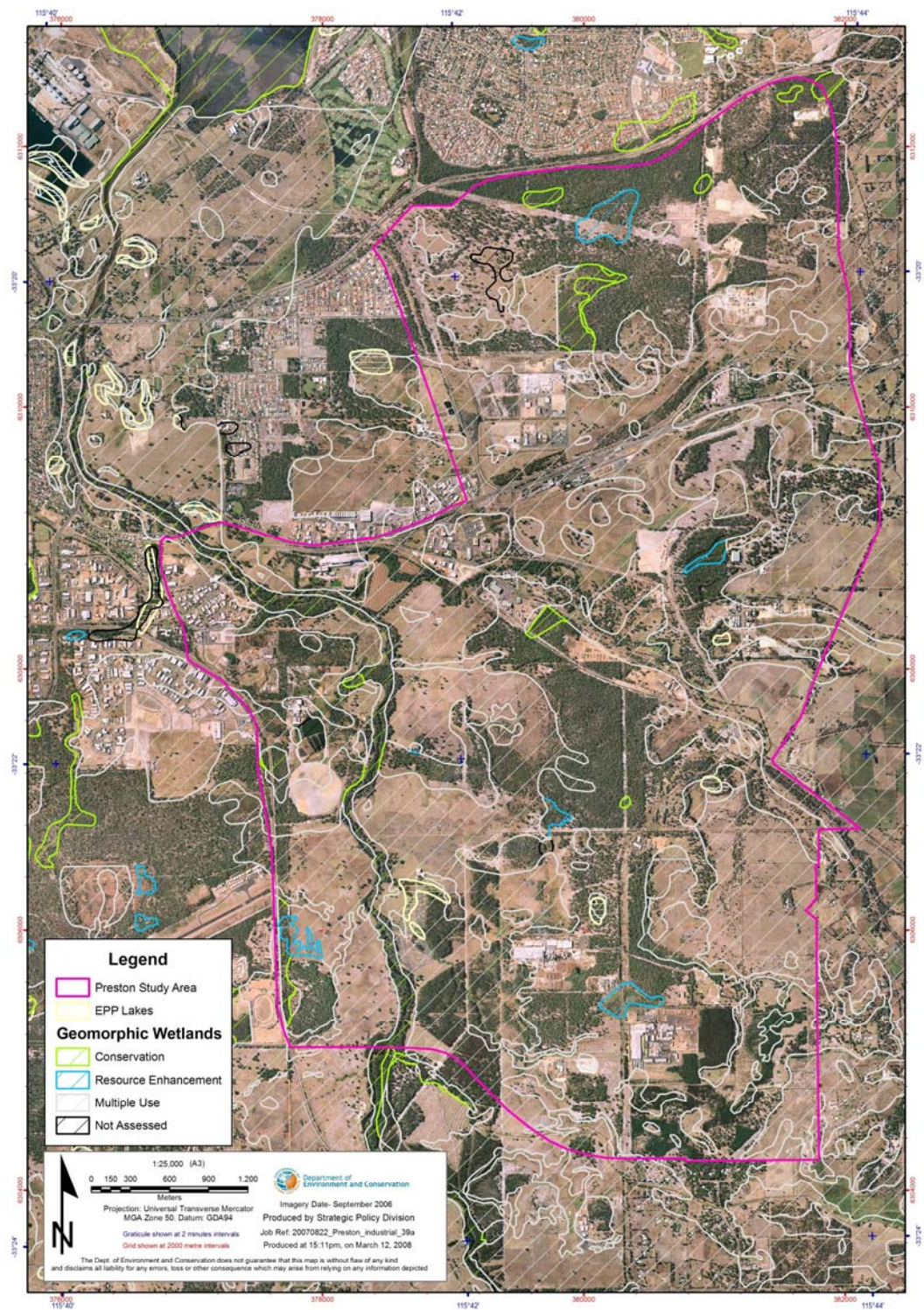


Figure 4. Geomorphic wetlands and EPP Lakes in the Preston Industrial Park

The Wetlands Program of the DEC has previously (2006/2007) undertaken re-evaluation of several wetlands within the PIP area resulting in updates to the *Geomorphic Wetlands Swan Coastal Plain* dataset of several wetlands identified in an earlier study undertaken by Bennett Environmental Consulting. The Preston Industrial Park – Environmental Study (Connell Wagner and Ecoscape 2007) and validations undertaken by DEC have identified further wetlands that appear likely to have higher values than previously recognised in the *Geomorphic Wetlands Swan Coastal Plain* dataset. Based on the new information obtained on the wetlands values, requests to modify the dataset have been submitted to the Wetlands Program of DEC. Therefore, where indicated on the Assessment Sheets (Appendix 6) the management category is currently subject to review by DEC.

7.4 Ecological Linkage

In the GBRS the EPA (2003a) presented its policy on the identification of the regionally significant sequences of ecological communities within and between the major landform elements which it referred to as ecological linkages as identified in the Ecological Linkages Plan (Appendix 3). The EPA considered that sufficient information had been gathered to broadly identify a series of regionally important ecological linkages(EPA 2003a).

The vegetation within the PIP forms part of the following regional ecological linkages previously identified by the EPA, namely:

- McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage;
- Maidens/Preston River east-west ecological linkage (also known as Ocean to Preston Link or Ocean to Preston River Park);
- Preston River ecological linkage (portion of Preston River in the City of Bunbury outside of the McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage); and
- Ferguson River ecological linkage(EPA 2003a).

The PIP occurs at the junction of these four ecological linkages, and therefore the natural areas within the PIP have a considerably greater linkage role in both north-south and east-west directions. The natural areas within the PIP provide ecological linkage to the west to the Indian Ocean, to the north to the Leschenault Estuary, and east and south to the Darling Scarp and Plateau.

The EPA considers that naturally vegetated areas in the area of the linkages should be priorities for retention and protection (EPA 2003a).

8. Assessment

In providing strategic advice on the areas of Native Vegetation to be retained within the PIP the EPA has applied the Strategy to Identify Regionally Significant Natural Areas described in Section 5.

In order to identify the areas of regional significance the EPA has considered the environmental studies put forward by the WAPC, in particular the *Preston Industrial Park – Environmental Study (2007)* undertaken by Connell Wagner and Ecoscape. This study consolidated previous environmental studies that had been undertaken for the PIP area with regard to native vegetation and provides information on fauna and wetlands.

The EPA has reviewed and validated the Environmental Study, considered other biological studies in the area, and in undertaking further work to verify the findings of the study, added substantial fauna information. Information from both Connell Wagner and Ecoscape (2007) and the DEC's investigations (DEC 2007a) has been collated to apply the strategy for the identification of regionally significant natural areas.

The PIP area has been divided into 25 Investigation Areas (Figure 5). Investigation Areas were delineated by considering the draft remnant vegetation mapping from Swan Bioplan and the areas defined in Connell Wagner and Ecoscape (2007), to include all natural areas with bushland of 'Good' or better condition on the Keighery condition scale (Government of Western Australia 2000). A Natural Area Assessment Sheet has been completed for each of the Investigation Areas to assess them against the EPA's criteria for regional significance and are contained in Appendix 6. A brief description of each Investigation Area and how it meets the EPA's criteria is provided below in Sections 8.1.1 – 8.1.25.

The EPA has also identified further areas which are considered suitable for the enhancement and restoration of ecological linkage within the PIP. These are discussed in Section 9.

Where the EPA has undertaken a previous assessment relevant to these areas they are discussed in the relevant Investigation, or Recommendation Area.

The EPA has used these assessments to formulate strategic recommendations for protection of priority areas of regional conservation significance, enhancing and restoring ecological linkage. A summary of the overall recommendations is provided in Section 9.

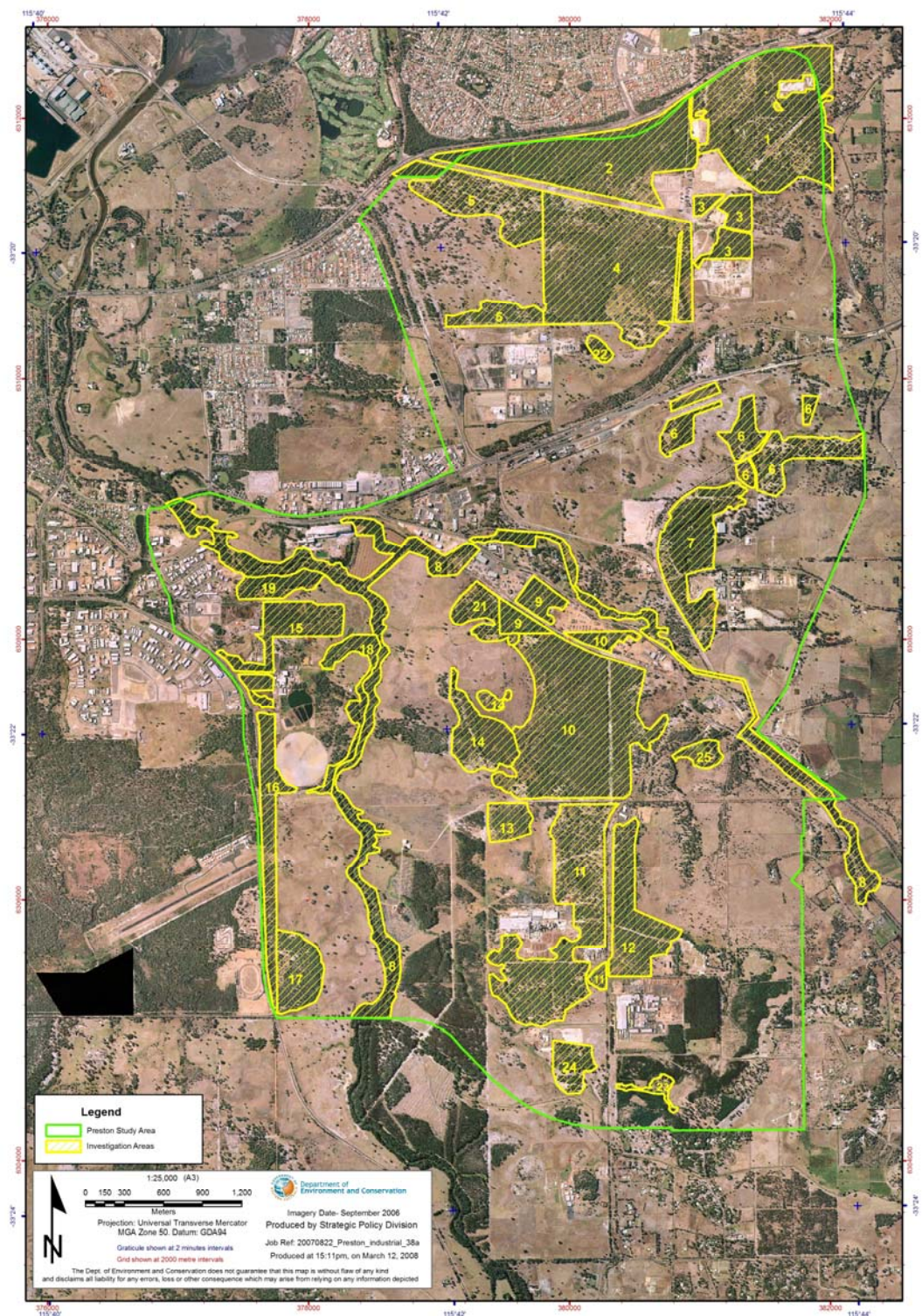


Figure 5. Investigation Areas

8.1 Investigation Areas

As mentioned above the study area has been divided into 25 Investigation Areas (Figure 5). Table 5 below indicates which criteria for regional significance each of the Investigation Areas meet. Please note there is no Investigation Area 20 as this area was determined to be a plantation.

Table 5: Criteria met for regional significance for each Investigation Area

<i>Investigation Area</i>	<i>Representation of communities</i>	<i>Diversity</i>	<i>Rarity</i>	<i>Maintenance of Processes</i>	<i>Scientific or Evolutionary</i>	<i>Wetland Protection</i>	<i>Number of Criteria Met</i>
1	x	x	x	x		x	5
2	x	x	x	x		x	5
3		x	x	x		x	4
4		x	x	x		x	4
5			x				1
6	x		x	x			3
7	x		x	x		x	4
8	x		x	x		x	4
9		x	x	x		x	4
10		x	x	x		x	4
11		x	x	x		x	4
12		x	x	x			3
13			NK*	x			1
14			x	x			2
15			x	x		x	3
16			x	x		x	3
17			x	x		x	3
18			NK*	x		x	2
19			NK*	x		x	2
21			x	x			2
22			NK*				1?
23			x				1
24			x	x			2
25	x	x	x	x		x	5

X = Criteria Met

*NK = Not Known, may meet this criteria but not verified because site specific information not available.

Almost all areas meet the criterion for Maintaining Ecological Processes and Natural Systems as they form part of the four regional ecological linkages previously recognised by the EPA within the PIP (EPA 2003a). The EPA (2003a) stated that naturally vegetated areas in the area of the linkages will be priorities for retention and protection, particularly if larger and relatively intact.

In undertaking the studies for the PIP no information was collected in order to apply the criterion for scientific or evolutionary importance. Therefore it should not be inferred that any particular area does not meet this criterion.

8.1.1 Investigation Area 1

Description

Investigation Area 1 is located on Lots 2 on diagram 78828 Picton East, Lot 84 on plan 29208 Picton East and Lot 40 on plan 232800 Taverner Road Picton East at the north west corner of the area known as the Northern Precinct of the PIP (Figure 5). The remnant vegetation covers an area of approximately 88ha. The land is currently zoned Rural and Primary Regional Roads under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

This area is marginally impacted by the alignment of the Bunbury Outer Ring Road. The position of this road was assessed in the GBRS (Bulletin 1108) and the final alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to this road, including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 1 are described in detail in Sheet 1 (Appendix 6). Investigation Area 1 is considered to be a regionally significant natural area meeting 5 criteria. The natural attributes of Investigation Area 1 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in predominately Very Good condition of the Southern River Vegetation complex.
- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.
- Rarity;
 - Location for 4 Priority and 1 poorly reserved Flora.
 - Location for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), 1

Priority species (Quenda) and at least 9 bird species listed as conservation significant on the Swan Coastal Plain.

- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains 2 Conservation Category wetlands and 1 wetland that has previously not been identified in the *Geomorphic Wetlands Swan Coastal Plain* dataset.

It is the EPA's opinion that:

- a) Investigation Area 1 is a regionally significant natural areas of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 1 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 1 is included in Area A as shown in Figure 6.

8.1.2 Investigation Area 2

Description

Investigation Area 2 is located on Lot 4 on diagram 71939 Picton East, and Part Lots 42 and 43 on plan 232805, Picton East and Part Lot 1 on diagram 71887 Temple Road Picton and Lot 44 on plan 232805 Temple Road Picton within the area known as the Northern Precinct of the PIP (Figure 5). The remnant covers an area of approximately 72ha. The land is currently zoned Rural and Industrial under the GBRS, General Farming under the Shire of Dardanup Town Planning Scheme No. 3 and Industry under the City of Bunbury Town Planning Scheme No. 7.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 2 are described in detail in Sheet 2 (Appendix 6). Investigation Area 2 is considered to be a regionally significant natural area meeting 5 criteria. The natural attributes of Investigation Area 2 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in Good to Very Good condition of the Southern River and Karrakatta Central and South vegetation complex.
- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.

- Rarity;
 - Location for 3 Priority and 5 poorly reserved Flora.
 - Location for 2 threatened bird species (Baudin's and Carnaby's Black Cockatoos), 1 threatened mammal species (Western Ringtail Possum), and at least 13 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains 2 Conservation Category wetlands.

The EPA acknowledges that a small portion of the Investigation Area is currently zoned industrial under the GBRS, consistent with the Town Planning Scheme. The EPA's records indicate that it has not previously assessed this zoning.

Summary

It is the EPA's opinion that:

- a) Investigation Area 2 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 2 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 2 is included in Area A as shown in Figure 6.

8.1.3 Investigation Area 3

Description

Investigation Area 3 is located on Lot 2 on diagram 17429 Picton East within the area known as the Northern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 15ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Sand excavation is currently being undertaken through a portion of the site.

Assessment

The natural attributes of Investigation Area 3 are described in detail in Sheet 3 (Appendix 6). Investigation Area 3 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 3 that contribute to meeting the criteria are listed below.

- Diversity;
 - A highly diverse area with respect to diversity of landform, wetland and upland vegetation units, habitat and fauna.
- Rarity;
 - Location for 3 threatened bird species (Red-tailed Black, Baudin's and Carnaby's Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 6 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a likely Conservation Category wetland.

Summary

It is the EPA's opinion that:

- a) Investigation Area 3 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 3 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 3 is included in Area A as shown in Figure 6.

8.1.4 Investigation Area 4

Description

Investigation Area 4 is located on Lot 2010 on diagram 43721 Picton East, Lots 42 and 43 on plan 232805, Picton East and Lot 1 on diagram 71887 Temple Road Picton within the area known as the Northern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 106ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 4 are described in detail in Sheet 4 (Appendix 6). Investigation Area 4 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 4 that contribute to meeting the criteria are listed below.

- Diversity;

- A highly diverse area with respect to diversity of landform, wetland and upland vegetation units, habitat and fauna.
- Rarity;
 - Location for 2 Priority and 1 poorly reserved flora.
 - Location for 1 priority mammal species (Quenda), and at least 8 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains 1 Conservation Category wetland.

Summary

It is the EPA's opinion that:

- a) Investigation Area 4 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 4 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 4 is included in Area A as shown in Figure 6.

8.1.5 Investigation Area 5

Description

Investigation Area 5 is located on Lot 44 on plan 232805 Temple Road and Lot 45 on plan 232805 Wimbridge Road Picton within the area known as the Northern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 46ha. The land is currently zoned Industrial under the GBRS and Industry under the City of Bunbury Town Planning Scheme No. 7.

Assessment

The natural attributes of Investigation Area 5 are described in detail in Sheet 5 (Appendix 6). Investigation Area 5 is considered to be a regionally significant natural area meeting 1 criterion. The natural attributes of Investigation Area 5 that contribute to meeting the criterion are listed below.

- Rarity;
 - Location for 2 threatened bird species (Red-tailed Black and Baudin's Black Cockatoo), and at least 2 bird species listed as conservation significant on the Swan Coastal Plain.

The EPA acknowledges that the Investigation Area is within larger lots that are currently zoned Industrial under the GBRS, consistent with the TPS. The EPA considers that adequate protection of the values of this site can be provided through conservation and management as part of future planning proposals. The EPA

considers that land outside of the Investigation Area within these lots can be developed for the intended industrial purpose.

Summary

It is the EPA's opinion that:

- a) Investigation Area 5 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 5 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 5 is included in Area F as shown in Figure 6.

8.1.6 Investigation Area 6

Description

Investigation Area 6 is located on Lot 61 on plan 11034 Picton East, Lots 104 and 105 on diagram 96, Picton East, Lot 1 on plan 232800, Martin Pelusey Road, Picton East and Lot 603 on plan 246179, Martin Pelusey Road, Picton East within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 41ha. The land is currently zoned Industrial and Rural under both the GBRS and Restricted Use R2 and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA has previously considered the rezoning of a portion of this land under S48A of the EP Act in relation to rezoning of Lots 104 and 105 on diagram 96, Picton East. The most recent of these rezonings was in 2005 when the subject land was rezoned from Restricted Use – Integrated Wool Processing Plant to Restricted Use – Dry Industry.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 6 are described in detail in Sheet 6 (Appendix 6). Investigation Area 6 is considered to be a regionally significant natural area meeting 3 criteria. The natural attributes of Investigation Area 6 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in degraded to completely degraded condition of the Guildford and Southern River Vegetation complexes.
- Rarity;
 - Location for 1 threatened bird species (Red-tailed Black Cockatoo), and at least 4 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;

- Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).

The EPA acknowledges previous decisions may impact upon the ability to protect natural areas of regional significance within the Investigation Area. The EPA's opinion on this area has been reached because the EPA has reassessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated. The EPA acknowledges that the Investigation Area is within larger lots that are currently zoned Industrial under the GBRS, consistent with the TPS. The EPA considers that adequate protection of the values of this site can be provided through conservation and management as part of future planning proposals. The EPA considers that land outside of the Investigation Area within these lots can be developed for the intended industrial purpose.

Summary

It is the EPA's opinion that:

- a) Investigation Area 6 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 6 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 6 is included in Area G as shown in Figure 6.

8.1.7 Investigation Area 7

Description

Investigation Area 7 is located on Lots 104 and 102 on diagram 96, Picton East, Lot 200 on plan 34987 Picton East, Lot 3 on diagram 50159 (Harris Road), Picton East, Lot 0 on plan 529, Picton East, Lot 100 on diagram 88, Harris Road, Picton East and Lot 87 on plan 13869 Picton East within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 38ha. The land is currently zoned Industrial and Rural under the GBRS and Restricted Use R2, Additional Use A4 and General Farming under the Shire of Dardanup Town Planning Scheme No.3, and Light Industrial and General Industry and Public Open Space under the Shire of Dardanup Town Planning Scheme No.7.

The EPA has previously considered the majority of the site within Investigation Area 7. In September of 2003 the EPA released its Report and Recommendations (Bulletin 1112) in relation to the proposed clearing of approximately 22ha of native vegetation for agriculture Collie Agricultural Area Lot 37 Harris Road Picton. The EPA concluded in this report that the proposal could not be managed to meet the EPA's objectives in relation to Biodiversity and Conservation, and Wetlands (EPA 2003b). The Minister for the Environment subsequently upheld the EPA's recommendation. Accordingly this decision is reflected in the consideration of this Investigation Area.

The EPA has previously considered the rezoning of the southern portion of Investigation Area 7 under S48A of the EP Act in relation to rezoning of the Harris Road Parkland Estate under the Shire of Dardanup Town Planning Scheme No. 7.

More recently the EPA considered the subdivision of Lot 3 on diagram 50159 (Harris Road), Picton East under Section 38 of the EP Act.

Assessment

The natural attributes of Investigation Area 7 are described in detail in Sheet 7 (Appendix 6). Investigation Area 7 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 7 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in Good to Very Good condition of the Guildford vegetation complex.
- Rarity;
 - Location for 3 Priority and 5 poorly reserved Flora
 - Location for 2 threatened bird species (Baudin's and Red-tailed Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 3 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains 1 EPP Lake and 2 likely Conservation Category wetlands.

The EPA acknowledges that previous decisions made under Section 48A, and subsequently S38, have impacted upon its ability to protect natural areas of regional significance within this Investigation Area. Accordingly the EPA has taken this into consideration in making its recommendations.

Summary

It is the EPA's opinion that:

- a) Investigation Area 7 is a regionally significant natural area of high value which should be retained within the future planning for the PIP area.
- b) Investigation Area 7 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 7 is included in Recommendation Area E as shown in Figure 6.

8.1.8 Investigation Area 8

Description

Investigation Area 8 is located on various lots along both the Preston and Ferguson Rivers within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 105ha. The land is currently zoned Regional Open Space under the GBRS and Parks and Recreation

under the City of Bunbury Town Planning Scheme No.7, and Recreation and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

Assessment

The natural attributes of Investigation Area 8 are described in detail in Sheet 8 (Appendix 6). Investigation Area 8 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 8 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in predominately Good to Degraded condition of the Southern River, Swan and Guildford Vegetation Complexes.
- Rarity;
 - Location for 1 Priority and 4 poorly reserved flora.
 - Location for 1 threatened bird species (Baudin's Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 4 bird species that are of regional conservation significance.
- Maintaining Ecological Processes or Natural Systems;
 - Part of 3 regional ecological linkages: Ferguson River, Preston River and McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains both the Preston and Ferguson Rivers.
 - The area contains Conservation Category wetlands.

Summary

It is the EPA's opinion that:

- a) Investigation Area 8 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 8 should be retained as Regional Open Space, as a future amendment to the GBRS where not previously reserved, and appropriately managed.

Accordingly Investigation Area 8 is included in Area C as shown in Figure 6.

8.1.9 Investigation Area 9

Description

Investigation Area 9 is located on Lot 5545 on plan 21705, Crown Reserve 40552, South Western Highway, Picton within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 13ha. The land is currently zoned Rural, Primary Regional Roads, Railways and Industrial under the GBRS and Industry, Rural, Primary Distributor Road and Railway under the City of Bunbury Town Planning Scheme No. 7.

This Investigation Area is intersected by the alignment of the Port Access Road. The alignment of this road was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to the Port Access Road including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road, and a foreshore management plan for the Ferguson River in the vicinity of the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, and remnant vegetation, wetland, watercourses, fauna and noise for the Port Access Road, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 9 are described in detail in Sheet 9 (Appendix 6). Investigation Area 9 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 9 that contribute to meeting the criteria are listed below.

- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.
- Rarity;
 - Location for 3 Priority and 9 poorly reserved Flora
 - Location for 1 threatened species (Western Ringtail Possum) and at least 7 regionally significant bird species.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage) and adjacent to the Ferguson River ecological linkage.
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a Conservation Category wetland.

The EPA acknowledges that a portion of the Investigation Area is currently zoned industrial under the GBRS, consistent with the Town Planning Scheme. The EPA's records indicate that it has not previously assessed this zoning.

Summary

It is the EPA's opinion that:

- a) Investigation Area 9 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 9 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 9 is included in Area B as shown in Figure 6.

8.1.10 Investigation Area 10

Description

Investigation Area 10 is located on Lot 5, on plan 7878, Boyanup-Picton Road Picton East and Lot 520 on plan 301384, Picton East within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 111ha. The land is currently zoned Rural, Industrial, Railways and Primary Regional Roads under the GBRS and General Farming, General Industry and Public Utilities under the Shire of Dardanup Town Planning Scheme No. 3.

This Investigation Area is intersected by the alignment of the Bunbury Outer Ring Road and Port Access Road. The alignment of these roads was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to these roads including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, and remnant vegetation, wetland, watercourses, fauna and noise for the Port Access Road and Bunbury Outer Ring Road, to allow for a more detailed assessment at later stages of the planning process.

The EPA is also currently undertaking an Environmental Review of an amendment for the proposed rezoning of the subject land from General Farming to Development Zone under the Shire of Dardanup Town Planning Scheme No. 3.

Assessment

The natural attributes of Investigation Area 10 are described in detail in Sheet 10 (Appendix 6). Investigation Area 10 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 10 that contribute to meeting the criteria are listed below.

- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.
- Rarity;
 - Guildford vegetation complex
 - Location for 1 Priority and 9 poorly reserved Flora
 - Location for 2 threatened bird species (Red-tailed Black and Carnaby's Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 11 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).

- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a Conservation Category wetland

Summary

It is the EPA's opinion that:

- a) Investigation Area 10 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 10 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 10 is included in Area B as shown in Figure 6.

8.1.11 Investigation Area 11

Description

Investigation Area 11 is located on Lots 1, 2 and 3 on diagram 46933, Moore Road Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 75ha. The land is currently zoned Rural, Industrial and Primary Regional Roads under the GBRS and General Farming, General Industry and Important Regional Roads under the Shire of Dardanup Town Planning Scheme No. 3.

This Investigation Area is intersected by the alignment of the Bunbury Outer Ring Road and Port Access Road. The alignment of these roads was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to these roads including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, and remnant vegetation, wetland, watercourses, fauna and noise for the Port Access Road and Bunbury Outer Ring Road, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 11 are described in detail in Sheet 11 (Appendix 6). Investigation Area 11 is considered to be a regionally significant natural area meeting 4 criteria. The natural attributes of Investigation Area 11 that contribute to meeting the criteria are listed below.

- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.
- Rarity;

- Location for 1 Priority and 5 poorly reserved Flora.
- Location for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 9 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains an EPP Lake.

The EPA acknowledges that a portion of the Investigation Area is currently zoned industrial under the GBRS, consistent with the Town Planning Scheme. The EPA does not consider that the recommendations in this report prevent the continued Industrial land use at this locality.

Summary

It is the EPA's opinion that:

- a) Investigation Area 11 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 11 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 11 is included in Area B as shown in Figure 6.

8.1.12 Investigation Area 12

Description

Investigation Area 12 is located on Lots 4 on diagram 46933 Dardanup West, Lot 10 on diagram 82158, Busher Road, Dardanup West and Lot 609 on plan 246174, Resta Rd Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 31ha. The land is currently zoned Industrial under the GBRS and General Farming and General Industry, under the Shire of Dardanup Town Planning Scheme No. 3.

Assessment

The natural attributes of Investigation Area 12 are described in detail in Sheet 12 (Appendix 6). Investigation Area 12 is considered to be a regionally significant natural area meeting 3 criteria. The natural attributes of Investigation Area 12 that contribute to meeting the criteria are listed below.

- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units and habitat.

- Rarity;
 - Location for 1 poorly reserved Flora.
 - Location for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo), and at least 3 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage)

The EPA acknowledges that this Investigation Area is currently zoned industrial under the GBRS. The EPA's opinion on this area has been reached because the EPA has reassessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated.

Summary

It is the EPA's opinion that:

- a) Investigation Area 12 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 12 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 12 is included in Area B as shown in Figure 6.

8.1.13 Investigation Area 13

Description

Investigation Area 13 is located on Lot 1 on diagram 46933 Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 9ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 13 are described in detail in Sheet 13 (Appendix 6). Investigation Area 13 is considered to be a regionally significant natural area meeting 1 criterion and likely to meet a second. The natural attributes of Investigation Area 13 that contribute to meeting the criteria are listed below.

- Rarity (Not Known, insufficient information);
 - Location for at least 3 bird species listed as conservation significant on the Swan Coastal Plain.
 - Likely habitat for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo)

- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage)

Summary

It is the EPA's opinion that:

- a) Investigation Area 13 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 13 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 13 is included in Area B as shown in Figure 6.

8.1.14 Investigation Area 14

Description

Investigation Area 14 is located on Lot 5 on plan 7878, Boyanup-Picton Road Picton East within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 23ha. The land is currently zoned Rural under the GBRS, and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA is currently undertaking an Environmental Review of an amendment for the proposed rezoning of the subject land from General Farming to Development Zone under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 14 are described in detail in Sheet 14 (Appendix 6). Investigation Area 14 is considered to be a regionally significant natural area meeting 2 criteria. The natural attributes of Investigation Area 14 that contribute to meeting the criteria are listed below.

- Rarity;
 - Location for Declared Rare Flora *Diuris drummondii*
 - Location for 1 threatened mammal species (Western Ringtail Possum), and at least 5 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).

Summary

It is the EPA's opinion that:

- a) Investigation Area 14 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 14 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 14 is included in Area B as shown in Figure 6.

8.1.15 Investigation Area 15

Description

Investigation Area 15 is located on Lot 3 on plan 17167 Davenport within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 21ha. The land is currently zoned Industrial under the GBRS and Industry and Parks and Recreation under the City of Bunbury Town Planning Scheme No. 7.

In its assessment of the GBRS, the EPA identified land within in Investigation Area 15 as an area that is suitable for providing a consolidate linkage between Reserve 670 (Investigation Area 16) and the Preston River. The EPA determined that the environmental factors of native vegetation, flora, fauna and ecological linkage should be deferred for this area.

Assessment

The natural attributes of Investigation Area 15 are described in detail in Sheet 15 (Appendix 6). Investigation Area 15 is considered to be a regionally significant natural area meeting 3 criteria. The natural attributes of Investigation Area 15 that contribute to meeting the criteria are listed below.

- Rarity;
 - Location for 1 threatened mammal species (Western Ringtail Possum) and at least 3 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: Maidens/Preston River (east-west ecological linkage)
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a likely Conservation Category wetland.

The EPA acknowledges that this Investigation Area is currently zoned industrial under the GBRS, consistent with the TPS. The EPA's records indicate that it has not previously assessed this zoning. The EPA's opinion on this area has been reached because the EPA has now assessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated.

Summary

It is the EPA's opinion that:

- a) Investigation Area 15 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 15 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 15 is included in Area D as shown in Figure 6.

8.1.16 Investigation Area 16

Description

Investigation Area 16 is located on Lots 1050 on plan 33291, Crown Reserve 670 South Western Highway Davenport, Lot 549 on plan 213069 South Western Highway, Lot 5 on diagram 50137 South West Highway Davenport and Lots 14 and 15 on plan 64665 South West Highway Davenport within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 28ha. The land is currently zoned Regional Open Space, Public Purpose, Rural, Primary Regional Roads and Industrial under the GBRS and Industry, Special Use 17 and 18, Parks and Recreation, Rural Public Purposes, Primary Distributor Road and Development Zone-Industrial under the City of Bunbury Town Planning Scheme No. 7.

The EPA's assessment of the GBRS considered the zoning of Lot 15 on plan 64665 South Western Highway (North Boyanup Road) Davenport and the reservation of part Lot 5 on diagram 50137 South West Highway (North Boyanup Road) Davenport and Crown Reserve 670 South Western Highway (North Boyanup Road).

In considering Lot 15, the EPA recommended that the vegetation in the southern corner should be protected through the future planning process. The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and fauna for Lot 15 North Boyanup Road, Davenport under the GBRS to allow for a more detailed assessment at later stages of the planning process

Part Lot 5 and the southern portion of Reserve 670 was reserved in the GBRS, however at this time the EPA considered that there may be some scope for development in the northern portion. Accordingly the EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation fauna and ecological linkage for Reserve 670 North Boyanup Road, Davenport under the GBRS to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 16 are described in detail in Sheet 16 (Appendix 6). Investigation Area 16 is considered to be a regionally significant natural area meeting 3 criteria. The natural attributes of Investigation Area 16 that contribute to meeting the criteria are listed below.

- Rarity;
 - Location for 5 poorly reserved Flora.
 - Location for 1 threatened bird species (Baudin's Black Cockatoo), and at least 7 bird species listed as conservation significant on the Swan Coastal Plain.

- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: Maidens/Preston River (east-west ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains 2 Conservation Category wetlands.

The EPA's opinion on this area has been reached because the EPA has reassessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated. The EPA acknowledges that the Investigation Area is within larger lots that are currently zoned industrial under the GBRS, consistent with the TPS. The EPA considers that adequate protection of the values of this site can be provided through conservation and management as part of future planning proposals. The EPA does consider that land outside of the Investigation Area within these lots can be developed for the intended industrial purpose.

Summary

It is the EPA's opinion that:

- a) Investigation Area 16 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 16 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 16 is included in Area D as shown in Figure 6.

8.1.17 Investigation Area 17

Description

Investigation Area 17 is located on Lot 15 on plan 64665 South Western Highway Davenport within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 18ha. The land is currently zoned Primary Regional Roads and Industrial under the GBRS and Primary Distributor Road and Development Zone-Industrial under the City of Bunbury Town Planning Scheme No. 7.

The EPA's assessment of the GBRS considered the zoning of Lot 15 on plan 64665 South Western Highway (North Boyanup Road) Davenport. The EPA recommended that the vegetation consistent with Investigation Area 17 was regionally significant and should be protected through the future planning process.

This area is marginally impacted by the alignment of the Bunbury Outer Ring Road. The alignment of this road was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to this

road including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and fauna for Lot 15 North Boyanup Road, Davenport and remnant vegetation, wetland, watercourses, fauna and noise for the Port Access Road, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 17 are described in detail in Sheet 17 (Appendix 6). Investigation Area 17 is considered to be a regionally significant natural area meeting 3 criteria. The natural attributes of Investigation Area 17 that contribute to meeting the criteria are listed below.

- **Rarity;**
 - Location for 1 poorly reserved Flora.
 - Location for 2 threatened species (Baudin's Black Cockatoo and Western Ringtail Possum), and at least 2 bird species listed as conservation significant on the Swan Coastal Plain.
- **Maintaining Ecological Processes or Natural Systems;**
 - Part of a regional ecological linkage: Maidens/Preston River (east-west ecological linkage).
- **General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;**
 - The area contains a Conservation Category wetland.

The EPA's opinion on this area has been reached because the EPA has reassessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated. The EPA acknowledges that the Investigation Area is within a larger lot that is currently zoned industrial under the GBRS, consistent with the TPS. The EPA considers that adequate protection of the values of this site can be provided through conservation and management as part of future planning proposals. The EPA considers that land outside of the Investigation Area within these lots can be developed for the intended industrial purpose.

Summary

It is the EPA's opinion that:

- a) Investigation Area 17 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 17 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 17 is included in Area D as shown in Figure 6.

8.1.18 Investigation Area 18

Description

Investigation Area 18 is located on Lot 1 on diagram 12060 Davenport, within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 13ha. The land is currently zoned Regional Open Space and Industrial under the GBRS and Industry, Special Use 17 and Parks and Recreation, under the City of Bunbury Town Planning Scheme No. 7.

The EPA considered the portion of land on Lot 1 that was reserved as Regional Open Space in its assessment of the GBRS.

Assessment

The natural attributes of Investigation Area 18 are described in detail in Sheet 18 (Appendix 6). Investigation Area 18 is considered to be a regionally significant natural area meeting 2, and likely to meet 3 criteria. The natural attributes of Investigation Area 18 that contribute to meeting the criteria are listed below.

- Rarity (Not Known, insufficient information);
 - Location for 1 Priority and 1 unreserved flora.
 - Likely habitat for 1 threatened mammal species (Western Ringtail Possum).
- Maintaining Ecological Processes or Natural Systems;
 - Part of 2 regional ecological linkages: Preston River and Maidens/Preston River (east-west ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a Conservation Category wetland.

The EPA acknowledges that a marginal portion of the Investigation Area is currently zoned industrial under the GBRS, consistent with the Town Planning Scheme. The EPA's opinion on this area has been reached because the EPA has reassessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated. The EPA's records indicate that it has not previously assessed this zoning.

Summary

It is the EPA's opinion that:

- a) Investigation Area 18 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 18 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 18 is included in Area C as shown in Figure 6.

8.1.19 Investigation Area 19

Description

Investigation Area 19 is located on Lot 74 on plan 40593 Davenport within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 10ha. The land is currently zoned Industrial under the GBRS, and Industry and Parks and Recreation under the City of Bunbury Town Planning Scheme No. 7.

In its assessment of the GBRS, the EPA identified the land within Investigation Area 19 as an area that is suitable for providing a consolidated linkage between Reserve 670 (Investigation Area 16) and the Preston River. The EPA determined that the environmental factors of native vegetation, flora, fauna and ecological linkage should be deferred for this area.

Assessment

The natural attributes of Investigation Area 19 are described in detail in Sheet 19 (Appendix 6). Investigation Area 19 is considered to be a regionally significant natural area meeting 2 criteria, and likely to meet a third. The natural attributes of Investigation Area 19 that contribute to meeting the criteria are listed below.

- Rarity (Not Known, insufficient information);
 - Location for 1 priority flora.
 - Likely habitat for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo) and 1 threatened mammal species (Western Ringtail Possum).
- Maintaining Ecological Processes or Natural Systems;
 - Part of 2 regional ecological linkages: Preston River and Maidens/Preston River (east-west ecological linkage).
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains a Conservation Category wetland.

The EPA acknowledges that this Investigation Area is currently zoned industrial under the GBRS, consistent with the Town Planning Scheme. The EPA's records indicate that it has not previously assessed this zoning. The EPA also acknowledges it has now identified a larger area for retention. The EPA's opinion on this area has been reached because the EPA has now assessed the regional natural values of the site using the criteria to identify regionally significant areas and has found that the site has higher values than previously indicated.

Summary

It is the EPA's opinion that:

- a) Investigation Area 19 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 19 should be retained as Regional Open Space as a future amendment to the GBRS and appropriately managed.

Accordingly Investigation Area 19 is included in Area C as shown in Figure 6.

8.1.21 Investigation Area 21

Description

Investigation Area 21 is located on Lot 5 on plan 7878 Boyanup-Picton Road Picton East within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 12ha. The land is currently zoned Rural under the GBRS and Rural under the City of Bunbury Town Planning Scheme No. 7.

This Investigation Area is marginally impacted by the alignment of the Port Access Road. The alignment of this road was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to this road including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, and remnant vegetation, wetland, watercourses, fauna and noise for the Port Access Road, to allow for a more detailed assessment at later stages of the planning process.

The EPA is also currently undertaking an Environmental Review of an amendment for the proposed rezoning of the subject land from General Farming to Development Zone - Industrial under the City of Bunbury Town Planning Scheme No. 7.

Assessment

The natural attributes of Investigation Area 21 are described in detail in Sheet 21 (Appendix 6). Investigation Area 21 is considered to be a regionally significant natural area meeting 2 criteria. The natural attributes of Investigation Area 21 that contribute to meeting the criteria are listed below.

- Rarity;
 - Location for 1 poorly reserved flora.
 - Location for 1 threatened mammal species (Western Ringtail Possum) and likely location for at least 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo).
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).

Summary

It is the EPA's opinion that:

- a) Investigation Area 21 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.

- b) Investigation Area 21 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 21 is included in Area H as shown in Figure 6.

8.1.22 Investigation Area 22

Description

Investigation Area 22 is located on Lots 2009 and 2010 on plan 43721 Picton East within the area known as the Northern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 2ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 22 are described in detail in Sheet 22 (Appendix 6). Investigation Area 22 may be considered to be a regionally significant natural area, likely to meet 1 criterion. The natural attributes of Investigation Area 22 that may contribute to meeting the criterion are listed below, but without further survey cannot be confirmed.

- Rarity (Not known, insufficient information);
 - Likely location for 3 threatened bird species (Baudin's, Carnaby's and Red-tailed Black Cockatoo) and 1 threatened mammal species (Western Ringtail Possum).

Summary

It is the EPA's opinion that:

- a) Investigation Area 22 may be a regionally significant natural area, but due to insufficient information, no specific recommendations have been made. However, since it may be regionally significant as habitat for threatened fauna, the, EPA's precautionary principle means there is a presumption that this area shall be retained. The onus is on the proponent of any proposal for development in this area to demonstrate that this area is not a significant habitat for rare fauna species.

8.1.23 Investigation Area 23

Description

Investigation Area 23 is located on Lot 75 on plan 21441 Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 3ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, to allow for a more detailed assessment at later stages of the planning process.

The EPA recently assessed the rezoning of Lot 75 from General Farming to Restricted Use under an amendment to the Shire of Dardanup Town Planning Scheme. The EPA determined that the environmental factors of native vegetation and fauna should be deferred for this area.

Assessment

The natural attributes of Investigation Area 23 are described in detail in Sheet 23 (Appendix 6). Investigation Area 23 is considered to be a regionally significant natural area meeting 1 criterion. The natural attributes of Investigation Area 23 that contribute to meeting the criterion are listed below.

- Rarity;
 - Location for 1 Priority flora.
 - Location for 1 threatened mammal species (Western Ringtail Possum).

The EPA considers that adequate protection of values can be provided through conservation and management as part of future planning proposals.

Summary

It is the EPA's opinion that:

- a) Investigation Area 23 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 23 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 23 is included in Area K as shown in Figure 6.

8.1.24 Investigation Area 24

Description

Investigation Area 24 is located on Lot 352 on plan 230087 Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 10ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 24 are described in detail in Sheet 24 (Appendix 6). Investigation Area 24 is considered to be a regionally significant natural area meeting 2 criteria. The natural attributes of Investigation Area 24 that contribute to meeting the criteria are listed below.

- Rarity;
 - Location for 1 threatened bird species (Baudin's Black Cockatoo), 1 threatened mammal species (Western Ringtail Possum), and at least 4 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Part of a regional ecological linkage: McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup (north-south ecological linkage).

The EPA considers that adequate protection of values can be provided through conservation and management as part of future planning proposals.

Summary

It is the EPA's opinion that:

- a) Investigation Area 24 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 24 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 24 is included in Area J as shown in Figure 6.

8.1.25 Investigation Area 25

Description

Investigation Area 25 is located on Lot 7 on plan 21434 Dardanup West within the area known as the Southern Precinct of the Preston Industrial Park (Figure 5). The Remnant covers an area of approximately 5ha. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

The EPA's assessment of the GBRS "deferred" the environmental factors of remnant vegetation and wetlands for all rural zoned land under the GBRS, to allow for a more detailed assessment at later stages of the planning process.

Assessment

The natural attributes of Investigation Area 25 are described in detail in Sheet 25 (Appendix 6). Investigation Area 25 is considered to be a regionally significant natural area meeting 5 criteria. The natural attributes of Investigation Area 25 that contribute to meeting the criteria are listed below.

- Representation of Ecological Communities;
 - Representative area of natural vegetation in predominately Very Good condition of the Guildford Vegetation complex.
- Diversity;
 - A highly diverse area with respect to diversity of landforms, wetland and upland vegetation units, habitat and fauna.

- Rarity;
 - Location for 2 threatened bird species (Carnaby's and Red-tailed Black Cockatoo), and at least 1 bird species listed as conservation significant on the Swan Coastal Plain.
- Maintaining Ecological Processes or Natural Systems;
 - Important bird breeding habitat.
- General Criteria for the Protection of Wetland, Streamline, and Estuarine Fringing Vegetation and Coastal Vegetation;
 - The area contains an EPP lake.

Summary

It is the EPA's opinion that:

- a) Investigation Area 25 is a regionally significant natural area of high value which should be retained within the future planning for the Preston Industrial Park area.
- b) Investigation Area 25 should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Accordingly Investigation Area 25 is included in Area I as shown in Figure 6.

9. Recommendation Areas

Based on these assessments the EPA considers that all Investigation Areas are regionally significant natural areas that should be retained in the future planning for the PIP. This is consistent with the EPA's policy in the GBRS that the general protection of remnant native vegetation on the Swan Coastal Plain should be achieved through the preferential location of developments in cleared areas (EPA 2003a).

The EPA has used these assessments to formulate strategic recommendations for protection of priority areas of regional conservation significance. Further to this the EPA has made recommendations for a series of natural areas in the PIP, for the purpose of enhancing and restoring ecological linkage. This is consistent with the EPA's policy statement in the GBRS that there be proactive planning for the restoration of ecological communities and landscape rehabilitation between and around selected sequences of the small remaining remnants on the eastern side of the Swan Coastal Plain in the Greater Bunbury Region (EPA 2003a).

The EPA's recommendations are discussed below and are divided into several categories. The categories acknowledge subsequent planning approvals processes that apply to the future development of the Preston Industrial Park which can provide for conservation and management. It should be noted that where Investigation Areas are described, the Lot numbers affected are not repeated below. The reader is referred to Section 8 above that details lot numbers which form Investigation Areas.

Conservation Areas

The EPA has identified areas that are considered to be the regionally significant natural areas of highest conservation value and should be retained as Regional Open

Space as a future amendment to the Greater Bunbury Region Scheme and appropriately managed for conservation purposes.

Conservation Areas A, B, C, D and E have been identified in this category (Figure 6).

Subdivision/Rezoning Protection

The EPA has also identified areas that are considered to be regionally significant natural areas of high conservation value which should be retained within the future planning for the Preston Industrial Park. Due to the size, shape, location or isolation of these areas the EPA considers that adequate protection of the values can be provided through conservation and management as part of future planning proposals. These areas should be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.

Subdivision/Rezoning Protection Areas F, G, H, I, J and K have been identified in this category (Figure 6).

Linkage – Enhancement or Restoration

The EPA has identified areas for enhancement or restoration in strategic locations between the Conservation and Subdivision/Rezoning Protection areas that contribute to regionally significant ecological linkage. These are natural areas that were not of a condition suitable to be included in an Investigation Area.

Opportunities should be explored through future rezoning, subdivision or development, including the implementation of other developments where offsets may be required, or conservation initiatives targeting the restoration and/or enhancement of these areas.

Identification of such areas allows for:

- Enhancement where some natural values remain, or
- Restoration where little or no natural values remain.

Linkage Enhancement Areas are identified as L, M, N, P and U (Figure 6).

Linkage Restoration Areas are identified as Q, R & S (Figure 6).

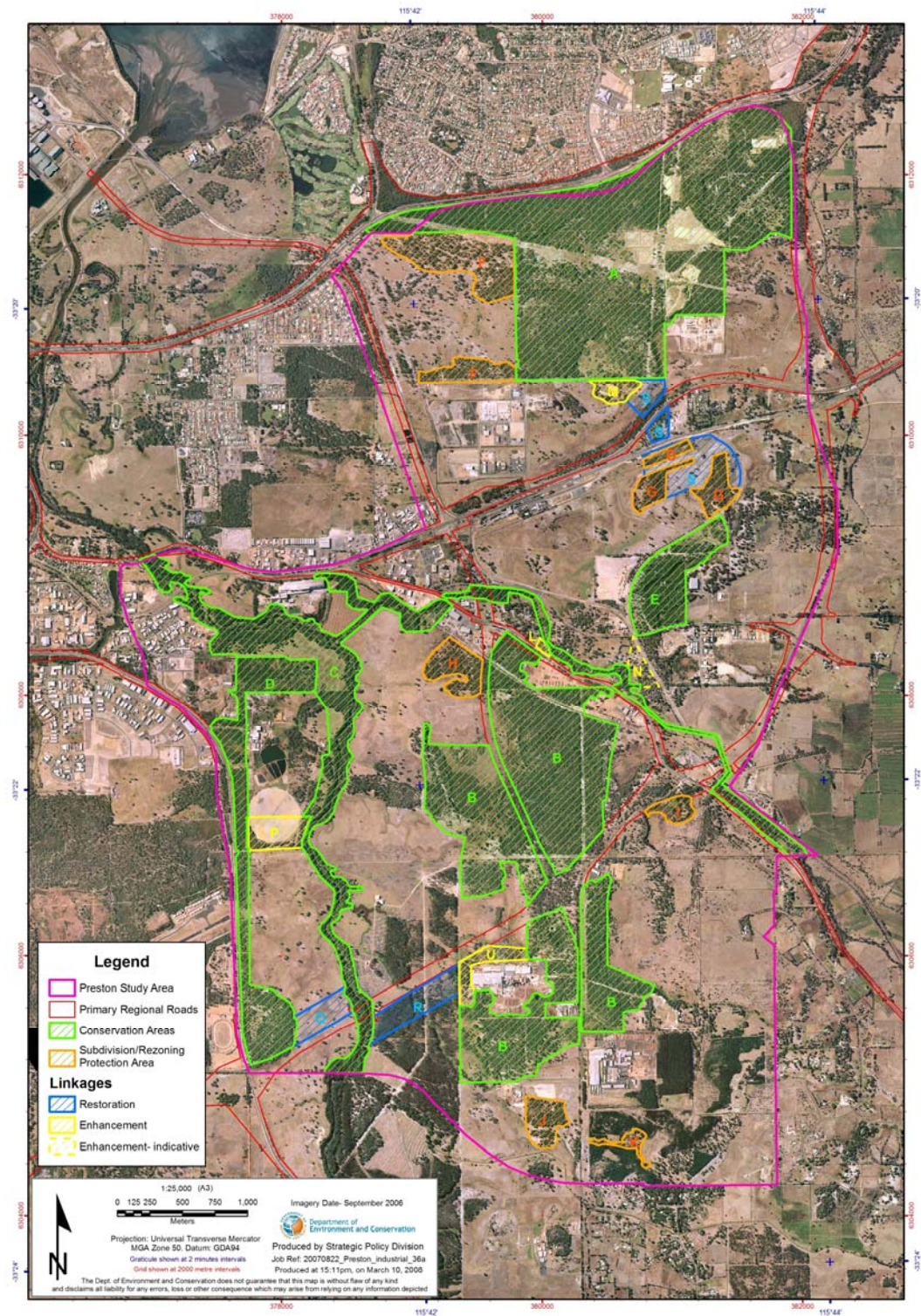


Figure 6. Recommendation Areas

9.1 Conservation Areas

These 5 areas represent the highest conservation values in the PIP, as they each meet at least 4 criteria for regional significance (Table 6). The EPA recommends that these 5 areas be retained as Regional Open Space as a future amendment to the Greater Bunbury Region Scheme and appropriately managed for conservation purposes.

Table 6: Criteria met for regional significance for proposed conservation areas

Conservation Area	Representation of communities	Diversity	Rarity	Maintenance of Processes and Systems	Scientific or Evolutionary	Wetland Protection	Total Criteria met for Regional Significance
A	x	x	x	x		x	5
B		x	x	x		x	4
C	x		x	x		x	4
D		x	x	x		x	4
E	x		x	x		x	4

9.1.1 Recommendation Area A

Recommendation Area A covers an area of approximately 314ha and includes Investigation Areas 1, 2, 3 and 4. The majority of the land is currently zoned Rural with a small part Industrial and Primary Regional Roads under the GBRS, General Farming under the Shire of Dardanup Town Planning Scheme No. 3, and Industry under the City of Bunbury Town Planning Scheme No. 7.

Area A meets the highest number of criteria for regional conservation significance of all the sites, includes areas in best condition, is the largest and most consolidated and is therefore the highest priority conservation area in the PIP.

9.1.2 Recommendation Area B

Recommendation Area B covers an area of approximately 269ha and includes Investigation Areas 9, 10, 11, 12, 13 and 14. The majority of the land is currently zoned Rural with a part zoned Industrial and Railways under the GBRS. At the local scale, it includes land zoned General Farming, General Industry and Public Utilities under the Shire of Dardanup Town Planning Scheme No. 3 and Rural, Industry and Railway under the City of Bunbury Town Planning Scheme No. 7.

Area B meets 4 criteria for regional conservation significance, and includes the second largest population in the state of the threatened flora *Diuris drummondii* (Tall Donkey Orchid) (DEC unpublished data).

9.1.3 Recommendation Area C

Recommendation Area C covers an area of approximately 133ha and includes Investigation Area 8, 18 and 19. The majority of the land is already zoned under the GBRS as Regional Open Space with a portion zoned Industrial and Railways. At the local scale, it includes land zoned Parks and Recreation, Special Use 18 and Railway under the City of Bunbury Town Planning Scheme No. 7 and General Farming and Public Utilities under the Shire of Dardanup Town Planning Scheme No. 3.

Area C meets 4 criteria for regional conservation significance, and is particularly significant for regional ecological linkage, providing linkage from north and west of the PIP through to the Darling and Whicher Scarps. Therefore this area connects major landforms in the Greater Bunbury Region, the coastal and estuarine areas of the portion of the Swan Coastal Plain to the Darling and Blackwood Plateaus.

This recommendation includes areas that are Completely Degraded and do not meet the criteria for regional conservation significance, but because they are within areas of high conservation significance they are not deemed to be suitable for development. Development of these areas is likely to indirectly impact on the significant environmental values that surround them. Such areas are recommended for reservation to Regional Open Space to be used for conservation and complementary purposes.

9.1.4 Recommendation Area D

Recommendation Area D covers an area of approximately 61ha and includes Investigation Areas 15, 16 and 17. The land is zoned Regional Open Space, Rural, Industrial and Public Purpose-Airport under the GBRS and Parks and Recreation, Rural, Development Zone-Industrial, Industry, Public Purposes (Local Government) and Special Use 17 and 18 under the City of Bunbury Town Planning Scheme No. 7.

Area D meets 4 criteria for regional conservation significance, and provides an important part of the Maidens/Preston ecological linkage.

9.1.5 Recommendation Area E

Recommendation Area E covers an area of approximately 32ha and includes the majority of Investigation Area 7. The land is zoned Rural and Industrial under the GBRS and Rural and Restricted Uses (R2 Dry Industry) under the Shire of Dardanup Town Planning Scheme No. 3.

Area E meets 4 criteria for regional conservation significance, and includes the best representation of the Guildford complex in the PIP.

The southern portion of Investigation Area 7 is not included in this recommendation in recognition of previous decisions.

9.2 Subdivision/Rezoning Protection Areas

These 6 areas include areas of regional conservation significance for which the EPA considers that adequate protection of the values can be provided through conservation and management as part of future planning proposals. These areas should be retained, as they each meet at least 1 criterion for regional significance (Table 7), and protected as part of any future rezoning, subdivision or development, whichever comes first.

Table 7: Criteria met for regional significance for proposed subdivision protection areas

<i>Conservation Area</i>	<i>Representation of communities</i>	<i>Diversity</i>	<i>Rarity</i>	<i>Maintenance of Processes and Systems</i>	<i>Scientific or Evolutionary</i>	<i>Wetland Protection</i>	<i>Total Criteria met for Regional Significance</i>
F			x				1
G	x		x	x			3
H			x	x			2
I	x	x	x	x		x	5
J			x	x			2
K			x				1

9.2.1 Recommendation Area F

Recommendation Area F covers an area of approximately 43ha and includes Investigation Area 5. The land is currently zoned Industrial under the GBRS and Industry under the City of Bunbury Town Planning Scheme No. 7.

Area F is generally in Good to Degraded condition but contains areas of habitat for 2 threatened bird species (Red-tailed Black Cockatoo and Baudin's Black Cockatoo). The regionally significant values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.2.2 Recommendation Area G

Recommendation Area G covers an area of approximately 18ha and includes Investigation Area 6. The land is currently zoned Industrial under the GBRS and Restricted Uses (R2 Dry Industry) under the Shire of Dardanup Town Planning Scheme No. 3.

Area G meets 3 criteria for regional conservation significance. Area G contains vegetation of the Guildford complex, provides habitat for 1 threatened bird species (Red-tailed Black Cockatoo) and forms a critical part of the ecological linkage between the northern and southern precincts of the PIP. However it is fragmented and in generally Degraded condition. The EPA considers that the regionally significant

values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.2.3 Recommendation Area H

Recommendation Area H covers an area of approximately 13ha and includes Investigation Area 21. The land is currently zoned Rural under the GBRS and Rural under the City of Bunbury Town Planning Scheme No. 7.

Area H meets 1 criterion for regional conservation significance, supporting populations of 1 threatened mammal species (Western Ringtail Possum). However Area H is small and isolated and the EPA considers that the regionally significant values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.2.4 Recommendation Area I

Recommendation Area I covers an area of approximately 5ha and includes Investigation Area 25. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

Area I meets 5 criteria for regional conservation significance, however due to the small size and isolation of Area I, the EPA considers that the regionally significant values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.2.5 Recommendation Area J

Recommendation Area J covers an area of approximately 10ha and includes Investigation Area 24. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

Area J meets 2 criteria for regional conservation significance, supporting populations of 1 threatened bird species (Baudin's Black Cockatoo) and 1 threatened mammal species (Western Ringtail Possum), and contributing to ecological linkage. However Area J is small and isolated and the EPA considers that the regionally significant values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.2.6 Recommendation Area K

Recommendation Area K covers an area of approximately 3ha and includes Investigation Area 23. The land is currently zoned Rural under the GBRS and Rural under the Shire of Dardanup Town Planning Scheme No. 3.

Area K meets 1 criterion for regional conservation significance and was observed to support a significant population of 1 threatened mammal species (Western Ringtail Possum), however due to the small size and isolation of Area K, the EPA considers that the regionally significant values of this area can be adequately protected through conservation and management as part of future planning proposals.

9.3 Linkage Enhancement Areas

The EPA has recommended areas in strategic locations for enhancement and restoration given the fragmented distribution of the remaining natural areas in the study area and the negative impact this has on long term viability in a changing climate. Where these areas have not been previously discussed in Section 8 the Lot numbers are identified below.

9.3.1 Recommendation Area L

Recommendation Area L is located on Lot 10 on diagram 60475, South Western Highway Picton on the Ferguson River Foreshore, within the area known as the Southern Precinct of the PIP (Figure 6). The recommendation covers an area of approximately 0.7ha. The land is currently zoned Rural under the GBRS and Parks and Recreation under the City of Bunbury Town Planning Scheme No. 7.

The EPA previously recommended this area for retention as ROS in its assessment of the GBRS in order to consolidate the size and shape of the Ferguson River Foreshore and provide linkage to the nearby Crown Reserve 5545. The EPA acknowledges that through the appeals process that it was determined by the Minister that the EPA's recommendation not be adopted. However, the ecological linkage values remain and require some level of protection.

The EPA makes its current recommendation on the basis that development of the area for industrial purposes will be incompatible with residential land use. Therefore during the rezoning process there is an opportunity to protect the ecological linkage and it is recommended that this land be acquired at this time and appropriately reserved or protected through planning approvals processes.

9.3.2 Recommendation Area M

Recommendation Area M is located on Lot 2010 on diagram 43721 Picton East, within the area known as the Northern Precinct of the Preston Industrial Park (Figure 6). The recommendation covers an area of approximately 5ha and includes part Investigation Area 4. The land is currently zoned Rural under the GBRS and General Farming under the Shire of Dardanup Town Planning Scheme No. 3.

This area is located directly adjacent to Conservation Area A and contains a Resource Enhancement wetland. This area contributes to the ecological linkage between core conservation areas (Conservation Areas A and E). While vegetation condition of this area is Degraded, management actions (such as weed control and enhancement plantings with native flora) would further enhance the ecological linkage values of this area.

9.3.3 Recommendation Area N

Recommendation Area N is located on Lot 37 on plan 128640 Harris Road Picton East on the Ferguson River Foreshore, within the area known as the Northern Precinct of the Preston Industrial Park (Figure 6). The recommendation covers an area of approximately 4ha. The land is currently zoned Industrial under the GBRS and

General Farming and Public Utilities under the Shire of Dardanup Town Planning Scheme No. 3.

There is a need to maintain and enhance the ecological linkage between the Ferguson River (Conservation Area C) and Conservation Area E. The boundary of this recommendation is indicative only and subject to review based on detailed investigation of the site.

9.3.4 Recommendation Area P

Recommendation Area P is located on Lots 5 on diagram 50137 South West Highway Davenport and Lot 1 on diagram 10260 (North Boyanup Road) Davenport within the area known as the Southern Precinct of the PIP (Figure 6). The Recommendation Area covers an area of approximately 11ha. The land is currently zoned Regional Open Space under the GBRS and Special Use 18 under the City of Bunbury Town Planning Scheme No. 7.

Recommendation Area P was identified for retention of Regional Open space under the GBRS. This area was considered through the appeals process and it was determined by the Minister that the area be retained for Regional Open Space as it is a key component of the Ocean to Preston River Park and is the only area of land providing direct linkage to the Preston River. In addition Ministerial Statement No.697 required that Pt Lot 1 North Boyanup Road be reserved for conservation purposes to provide an appropriate buffer to the Preston River and shall only be used for conservation and complementary purposes.

An assessment of aerial photography indicates that the vegetation within this area has been impacted leaving only a small corridor of vegetation along its southern boundary. The EPA therefore recommends that the area be revegetated to restore this linkage.

9.3.5 Recommendation Area U

Recommendation Area U is located on Lots 1 and 2 on diagram 46933 Moore Road Dardanup West within the area known as the Southern Precinct of the PIP (Figure 6). The recommendation covers an area of approximately 8ha. The land is currently zoned Rural and Industry under the GBRS and General Farming and General Industry under the Shire of Dardanup Town Planning Scheme No. 3.

The vegetation within Recommendation Area U contributes to linkage between Conservation Area B and the Preston River (Conservation Area C). Actions to manage this area for conservation purposes (such as weed control and enhancement plantings with native flora) would enhance the natural values of this area and further strengthen the regional ecological linkage.

9.4 Linkage Restoration Areas

9.4.1 Recommendation Area Q

Recommendation Area Q is located on Lot 15 on plan 64665 South West Highway Davenport within the area known as the Southern Precinct of the PIP (Figure 6). The recommendation covers an area of approximately 9ha. The land is currently zoned Industrial under the GBRS and Development Zone-Industrial under the City of Bunbury Town Planning Scheme No. 7.

This recommendation aims to restore linkage between the Ocean to Preston River Regional Park and the Preston River. This linkage area will require rehabilitation to restore the ecological linkage values of this area.

The alignment of Bunbury Outer Ring road was assessed in the GBRS (Bulletin 1108) and the alignment subsequently determined by the Minister for the Environment through the appeals process. Ministerial Statement No. 697 provides conditions relating to this road including the provision of an environmental offset strategy to mitigate unavoidable impacts on wetlands and native vegetation associated with the road. The EPA notes that the Ministerial Condition specifically relates to the rehabilitation of the strip of land adjacent to the road in the vicinity of Lot 15 North Boyanup Road (South Western Highway). The proposed Restoration Area Q may provide a suitable option to fulfil this requirement.

9.4.2 Recommendation Area R

Recommendation Area R is located on Lot 7 on Plan 10116 Davenport within the area known as the Southern Precinct of the PIP (Figure 6). The recommendation covers an area of approximately 14ha. The land is currently zoned Rural under the GBRS and Rural under the City of Bunbury Town Planning Scheme No. 7.

This recommendation aims to restore linkage between Conservation Area B and the Preston River (Conservation Area C). To overcome significant deficiencies in the ecological linkage between these high priority conservation areas, an area for restoration is required. This should be located in a strategic position that preferably traverses the shortest distance between Areas B and C to minimise the area required. The location of Recommendation Area R abuts the Bunbury Outer Ring Road and provides a management boundary. This linkage area will require rehabilitation.

9.4.3 Recommendation Area S

Recommendation Area S is located on Lot 105 on diagram 96, Picton East, Lot 2010 on diagram 43721 Picton East and Lot 1 on diagram 22496, South Western Highway, Picton East within the area known as the Northern Precinct of the PIP (Figure 6). The recommendation covers an area of approximately 24 ha. The land is currently zoned Rural, and Industry under the GBRS and General Farming and Restricted Uses (R2 Dry Industry) under the Shire of Dardanup Town Planning Scheme No. 3.

Recommendation Area S aims to consolidate Recommendation G and restore linkage between Conservation Area's A and E. The area is in Completely Degraded

condition, including pasture and exotic tree plantings in the South Western Highway road reserve, and therefore will require rehabilitation to restore the ecological linkage values of this area.

10. Other Advice

The EPA has identified the following environmental matters which will require further consideration during subsequent statutory planning processes (i.e. structure planning, town planning schemes, subdivision and development proposals):

1. Wetland Buffers;
2. Air Quality;
3. Noise;
4. Water Quality and Quantity;
5. Flood Way Mapping;
6. Acid Sulfate Soils;
7. Solid and Liquid Waste Disposal;
8. Risk; and
9. The requirement for construction materials
10. Development priority.

10.1 Wetlands

As discussed above in Section 7.3 several wetlands within the PIP area are likely to have higher values than previously recognised in the *Geomorphic Wetlands Swan Coastal Plain dataset*. Based on new information obtained, requests to modify the dataset have been submitted. Where indicated on the Assessment Sheets (Appendix 6) the management category of the wetlands are currently subject to review by DEC due to new information on wetland values. In future decision making the most recent version of the *Geomorphic Wetlands Swan Coastal Plain dataset* should be referred to.

The EPA is confident that there are unlikely to be wetlands of regional conservation significance outside of the recommended areas for retention, with two exceptions. The first is a wetland protected under the Lakes EPP located on Lot 7 on Plan 10116 Davenport. The EPA acknowledges that the Lakes EPP is currently part of the Bluegum plantation. However it remains that if the intention is to develop this wetland, then it is a requirement to seek authorisation to undertake activities in accordance with the Lakes EPP. The second wetland is a Conservation Category wetland located on Lot 1 on diagram 12060 Davenport. The recommended area for protection is based on a management boundary and the values of this wetland should be considered as part of any future rezoning, subdivision or development, whichever comes first.

The wetlands recommended for retention do not provide for buffers to the wetlands. A wetland buffer helps to maintain the ecological process and functions associated with the wetland and protect the wetland from potential adverse impacts (EPA 2005). The extent of the buffer around a wetland will depend on the wetland's values and management objectives, proximity to environmentally sensitive areas, and the

activities, land uses and development both existing and proposed, the threats posed and management applied (EPA 2005).

Buffers should be measured from the wetland boundary as delineated in the DEC's Geomorphic Wetlands Swan Coastal Plain dataset. Wetland buffers should be determined in accordance with Water and Rivers Position Statement: Wetlands (WRC 2001) and the Environmental Protection Authority's Draft Guidance Statement No. 33 Environmental Guidance for Planning and Development (EPA 2005). In addition, the information contained within the draft Guideline for the Determination of Wetland Buffer Requirements (by Essential Environmental Services (2005) for the Department for Planning and Infrastructure), should also be considered.

The EPA expects that appropriate buffers for wetlands are determined based on the values of the wetlands and proposed land uses, and protected and appropriately managed as part of any future rezoning, subdivision or development, whichever comes first.

10.2 Air Quality

The EPA's objective in regard to air quality is to ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2004b).

The DPI has commissioned a study entitled *Preston Industrial Park Buffer Definition Study* (SKM 2004) which addresses the issue of air quality including for gaseous emissions, air toxics, particulates, and odour. The EPA notes that the DEC Air Quality Management Branch has reviewed this report and that further modelling is required to demonstrate that the PIP can accommodate appropriate buffer requirements for air quality.

In view of the advice from DEC, the EPA recommends that the DPI extend the scope of the buffer study to include the consideration of fugitive particulate sources (PM₁₀) and to include all existing odour sources within the PIP in addition to proposed new industries. The EPA expects that such studies will include consideration of cumulative impacts.

The EPA recommends that the DPI seek advice from the DEC in to assist in achieving the required air quality studies.

10.3 Noise

The EPA's objective in regard to noise is to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards (EPA 2004b).

The Preston Industrial Park Buffer Definition Study (SKM 2004), commissioned by the DPI, addressed the issue of noise. The EPA notes that the DEC Noise

Management Branch has reviewed this report and published an Environmental Noise Report entitled *Preston Industrial Park Buffer Definition Study Noise Advice EN03/06* (DoE 2006) to assist with the consideration of noise in the future planning for the PIP.

The EPA notes that urban encroachment around the PIP area will limit the capacity of the PIP to accommodate typical industrial operations within the existing buffers and further modelling is required to demonstrate that the PIP can accommodate the proposed industrial development.

The EPA advises that environmental impact modelling in accordance with the EPA's criteria is required to demonstrate that the Structure Plan for the PIP area can accommodate the appropriate buffer requirements for noise, meeting both regulatory and acceptable standards. The EPA expects that modelling will be undertaken in accordance with Draft Guidance Statement No. 8 *Environmental Noise* (EPA 2007) and that such studies will address cumulative impacts.

10.4 Water Quality and Quantity

The EPA's objective in relation to water management is to:

- maintain the quality of water (surface and ground) so that existing and potential environmental values, including ecosystem maintenance are protected, and
- ensure that the quality of water emissions (surface, ground and marine) do not adversely affect environmental values or health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2004b).

The DPI has commissioned the *Preston Industrial Park Structure Plan Water Resources and Vegetation Management Strategy* (ENV 2005). The DoW has advised this report accurately describes how to manage stormwater in WA for both quantity and quality, and the drainage strategy recognises the site constraints, however an overall strategic drainage management strategy must be prepared as part of the Structure Plan for the PIP. Furthermore, the strategic drainage management strategy should be a complete document that includes all water resources, imported scheme water, waste water, abstraction, Acid Sulfate Soils, and recycled water.

The EPA expects that the water management strategy will protect both the quantity and quality of the Preston and Ferguson Rivers and significant wetlands within the PIP area. It is recommended that DPI seek advice from the DoW in to assist in achieving the required management strategy.

The EPA expects that the principles stated in the overall strategic drainage management strategy will be implemented at the Precinct Drainage and Lot Scale Planning stage when the technical plans are prepared and submitted to the DoW for approval prior to any ground disturbing activities.

10.5 Flood Way Mapping

The 100 year ARI floodplain mapping and associated floodplain management strategies have been developed for the Preston River in this area. However, there is no 100 year ARI floodplain mapping and associated floodplain management strategies developed for the section of the Ferguson River that runs through this area and this is required. It is recommended that DPI liaise with the DoW in regard to any assistance that may be provided to assist in achieving the required mapping and management strategies.

10.6 Risk

The EPA notes that *The Preston Industrial Park Buffer Definition Study* (SKM 2004) commissioned by the DPI also addresses the issue of risk. While the EPA no longer has an active role in the consideration of public safety it is expected that advice will be sought from appropriate government agencies and that the PIP will accommodate appropriate buffer requirements for risk.

10.7 Solid and Liquid Waste Disposal

The EPA's objective in relation to waste management is to :

- maintain the integrity, ecological function and values of the environment; and
- to ensure that emissions do not adversely affect the health, welfare and amenity of people and land uses (EPA 2005).

In accordance with the EPA's previous advice in Bulletin 902 the magnitude of solid and liquid waste generated at the PIP should be estimated and details of where the waste will be disposed and how it will be managed should be considered in the future planning for the area.

The EPA supports the liquid waste strategy in that no industrial development shall occur without connection to deep sewerage.

10.8 Acid Sulfate Soils

Acid sulfate soils (ASS) are naturally occurring soils and sediments containing sulphide minerals, predominantly pyrite (an iron sulphide). In an undisturbed state below the watertable, these soils are benign and not acidic. Inappropriate disturbance of these soils, causing oxidation of the pyrites, can generate large amounts of sulphuric acid and leaching of contaminants naturally occurring in soils. Flushing acidic leachate to groundwater and surface waters can cause site impacts including:

- ecological damage to aquatic and riparian ecosystems;
- contamination of groundwater with arsenic, aluminium and heavy metals; and
- damage to infrastructure through the corrosion of concrete, steel and other sub surface assets.

The types of activities which may cause the oxidation of acid sulfate soils include, but may not be limited to:

- dewatering operations;
- excavation or other soil disturbance;
- groundwater abstraction for private or commercial water supplies;
- groundwater level control by drainage;
- dredging operations; and
- land use changes which alter the water balance.

The mapping in the WAPC's Planning Bulletin 64 classifies the majority of the PIP area as a "moderate to low" risk of ASS occurring within 3 metres of the natural soil surface with a few defined areas predicted to a "high risk" of ASS.

The areas defined as having a "high risk" of ASS generally correspond with the Preston and Ferguson Rivers and their floodplains as well as the location of other wetlands on site.

The EPA's objective for ASS is to ensure that remediation achieves an acceptable standard that protects the environment, is compatible with the intended land use, and is consistent with appropriate criteria set out by the DEC.

Where there is a risk of disturbing acid sulfate soil, the EPA expects that the procedures outlined in Western Australian Planning Bulletin No. 64 Acid Sulfate Soils (WAPC 2003) will be followed.

This Planning Bulletin sets out the information that should be provided and the procedures to follow, including seeking comments from DEC. Detailed guidance on site investigations and the preparation of acid sulfate soil management plans is provided in the DEC Acid Sulfate Soil Guidelines series. The current titles in this series are listed on the DEC website (www.dec.wa.gov.au).

10.9 Requirement for Construction Materials

The proposal would require substantial volumes of fill to be imported to ensure that infrastructure is protected from inundation. Obtaining substantial quantities of fill could have flow-on environmental consequences. It is understood that there are limited approved supplies of sand and limestone fill materials available in the region. The requirement for large volumes of materials will impact on the availability of local materials and may bring forward the need to identify and develop new extraction areas. Many sites that contain undeveloped limestone and sand resources in the region occur in locations where environmental constraints, such as vegetation and regionally significant natural areas may preclude or severely constrain extraction. Noise, dust and amenity issues may also constrain extraction.

The EPA considers that it may be appropriate to examine alternative opportunities for clean fill materials that utilise an existing waste stream.

10.10 Development Priority

The EPA acknowledges that the DPI intend to progress the structure planning for the Northern Precinct in advance of the Southern Precinct of the PIP. The EPA is aware of a Preliminary Structure Plan for this portion which broadly protects the regionally significant natural areas. The EPA expects that the issues of wetland buffers, air quality, noise, water quantity and quality, risk, solid and liquid waste disposal, acid sulfate soils and requirements for construction materials will also be addressed for the Northern Precinct. In developing a water management strategy for the PIP the EPA considers that the Northern Precinct can be treated as a sub catchment.

11. Recommendations

The EPA recommends that:

- 1. All remnant vegetation within the Preston Industrial Park is considered to be regionally significant and should be retained.**
- 2. The vegetation in its entirety within Recommendation Areas A,B,C, D and E (Figure 6) be reserved as Regional Open Space in a future amendment to the GBRS and appropriately managed.**
- 3. That vegetation in its entirety within Recommendation Areas F,G, H, I, J, and K (Figure 6) be retained and protected as part of any future rezoning, subdivision or development, whichever comes first.**
- 4. Connectivity be enhanced in Recommendation Areas L, M, N, P and U (Figure 6) and restored in Areas Q, R & S (Figure 6) given the fragmented distribution of the remaining natural areas in the study area and the negative impact this has on long term viability in a changing climate.**
- 7. Appropriate buffers for wetlands be determined based on the values of the wetlands and proposed land uses, and protected and appropriately managed as part of any future rezoning, subdivision or development, whichever comes first.**
- 8. That the Minister note the Advice Provided in Section 10 on environmental matters that will require further consideration as part of future planning processes.**

Appendix 1

Glossary

Glossary

ASS - Acid Sulfate Soils

Conservation Area - an area recommended in this Bulletin for the purpose of retaining and protecting the natural values defined within that area. These areas include the highest priority regionally significant natural areas within the PIP.

Constrained Area - an area where there is an expectation that development will be able to proceed, this may include urban, urban deferred or industrial zoned land or land with existing development approvals.

Declared Rare Flora – species protected under the Wildlife Conservation Act 1950, as identified in the current listing.

Extant Taxa - taxa which have been adequately searched for and are determined to be either rare, in danger of extinction, or otherwise in need of special protection in the wild, and have been declared under Section 23F of the *Wildlife Conservation Act* 1950 to be ‘rare flora’.

Presumed Extinct Taxa - taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, of which all known wild populations have been destroyed more recently, and which have been declared under Section 23F of the *Wildlife Conservation Act* 1950 to be ‘rare flora’.

DEC - Department of Environment and Conservation

DoW - Department of Water

DPI - Department for Planning and Infrastructure

Eastern side of the Swan Coastal Plain -the Foothills and Pinjarra Plain major landform elements. For a more comprehensive description see Government of WA (2000b).

Ecological communities - ‘Naturally occurring biological assemblages that occur in a particular type of habitat’ (English and Blyth 1997). The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified. For this Bulletin, vegetation complexes (Hedde *et al.* 1980), floristic community types (Gibson *et al.* 1994, DEP 1996) and those ecological communities listed as threatened as defined in English and Blyth (1997), are considered to meet this definition.

Ecological linkage - an ecological linkage is defined as regionally significant sequences of ecological communities within and between the major landform elements. The EPA has identified 16 ecological linkages within the GBRs (EPA 2003a, Appendix 3).

Ecological Linkage – Enhancement - An area recommended in this Bulletin to retain and enhance existing ecological linkage functions.

Ecological Linkage – Restoration - An area recommended in this Bulletin for the restoration of ecological linkage between natural areas of regional conservation significance. This is consistent with EPA advice for the “focus of restoration of ecological communities and landscape rehabilitation between and around the small remaining remnants on the eastern side of the Swan Coastal Plain” (EPA 2003a).

Floristic community types - are distinctive floristic assemblages identified on the southern Swan Coastal Plain in Gibson *et al.* (1994) and DEP (1996). The presence or absence of individual taxa in standard areas (plots, sites, quadrats) is used to define floristic groupings based on shared species.

GBR - Greater Bunbury Region - The area covered by the Bunbury, Capel, Harvey and Dardanup Local Government Authorities (LGAs).

GBRS - Greater Bunbury Region Scheme

GWSCP - Geomorphic Wetlands Swan Coastal Plain dataset - The dataset of the Geomorphic Wetlands Swan Coastal Plain of wetland types and management categories as listed/held/maintained by DEC’s Wetland Program (DEC 2007c)

Investigation Area - natural area subject to investigation by the EPASU for the preparation of this Bulletin. Consistent with the numbering of the ‘Remnants’ identified in Connell Wagner and Ecoscape (2007) where possible.

Natural area - naturally vegetated area or non-vegetated areas such as water bodies (generally rivers, lakes and estuaries), bare ground (generally sand or mud) and rock outcrops.

PIP - Preston Industrial Park

Priority Fauna - are conservation significant animal taxa listed by DEC but are not currently listed under Section 14 (2) (ba) of the *Wildlife Conservation Act 1950* as Specially Protected Fauna. There are five categories of Priority fauna, from Priority 1 to 5.

Priority Flora - are plant taxa listed by DEC that are either under consideration as Threatened Flora but are in need of further survey to adequately determine their status, or are adequately known but require monitoring to ensure that their security does not decline. There are four categories of Priority flora, from Priority 1 to 4.

Protected - refers to bushland which is under a management regime that provides for its continuing protection.

Protection is all of the processes of ensuring the continued existence and viability of bushland, and may include preservation, maintenance, reinstatement, and restoration.

Subdivision/Rezoning Protection Area - Area of regional significance recommended in this Bulletin for retention and protection through the design and

implementation of any scheme amendments, subdivision and/or development of the area and/or the surrounding land.

Regionally Conservation Significant Fauna - Fauna species, additional to gazetted threatened species or Priority fauna, that are deemed to have regional conservation significance because they have undergone major status reductions or distributional reductions in the PIP area and more widely on the Swan Coastal Plain. Fauna species in this category are based on the similar category in Bush Forever (Government of WA 2000).

Regionally Conservation Significant Flora - Flora species, additional to gazetted threatened species or Priority flora, that are deemed to have regional conservation significance because they are considered poorly reserved or endemic on the Swan Coastal Plain. Flora species in this category are based on the similar category in Bush Forever (Government of WA 2000).

Regionally Significant Natural Area - A regionally significant natural area is defined as a component of remnant native vegetation or water body that collectively aims to form a comprehensive, adequate and representative system of protected conservation areas.

Regionally Significant Ecological Linkage - A regionally significant ecological linkage is a sequence of ecological communities within and between major landform elements. Within the GBRS portion of the SCP the EPA identified 16 ecological linkages (EPA 2003a). Two types of links were identified, river corridors and vegetated sequences.

SCP - Swan Coastal Plain - Swan Coastal Plain interim biogeographic region as defined by Thackway and Creswell (1995).

Taxa (singular **Taxon**) - a taxonomic group. Depending on context this may be a subspecies, species, genus or higher taxonomic grouping.

WAPC - Western Australian Planning Commission

Appendix 2

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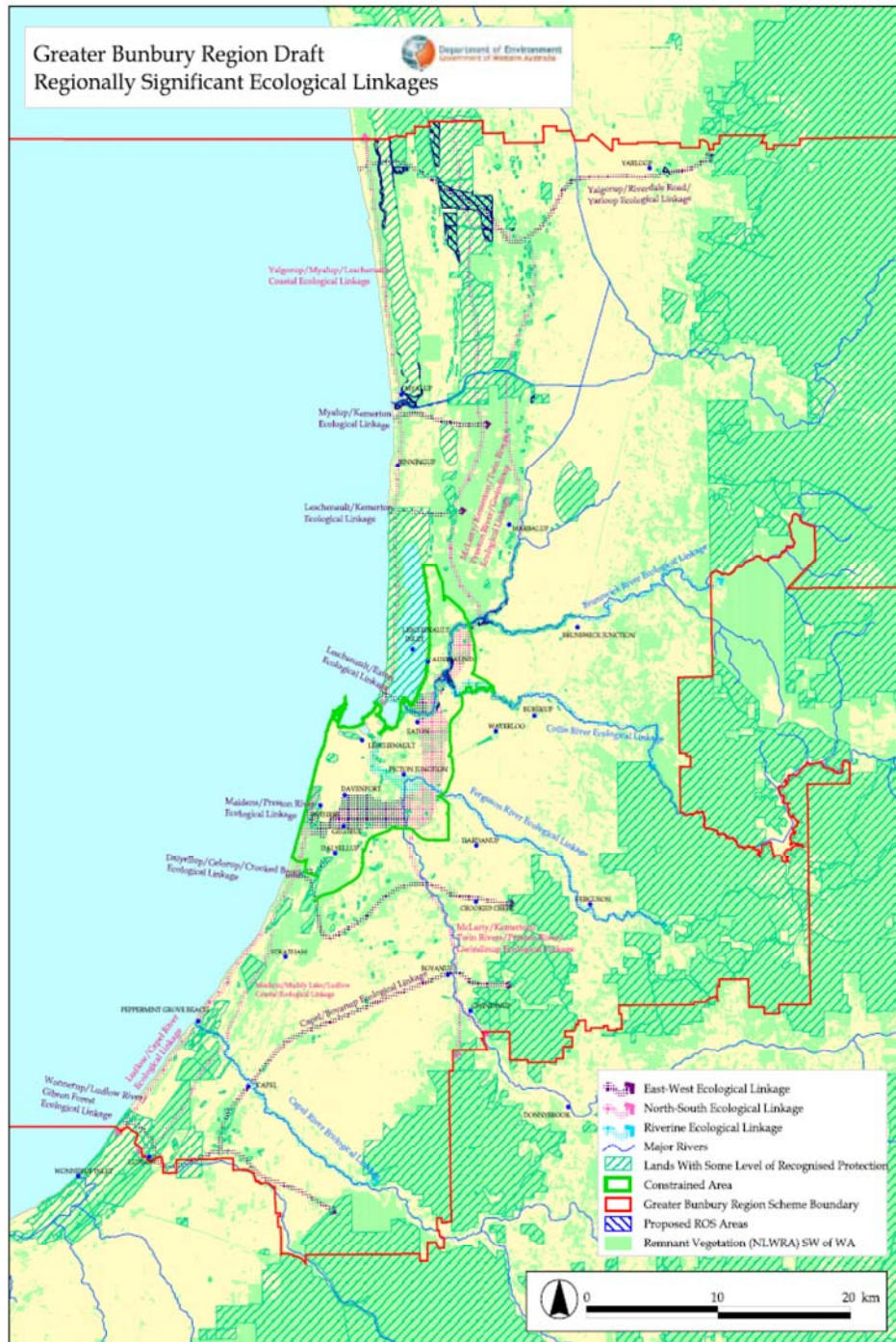
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Appendix 3

Regionally Significant Ecological Linkages

Greater Bunbury Region Draft Regionally Significant Ecological Linkages



Appendix 4

Previous EPA Assessments within the Preston Industrial Park

Previous EPA Assessments within the Preston Industrial Park

CRN	TITLE	Level of Assessment (LOA)	Date of LOA	EPA Bulletin	Relevant to Recommendation for Investigation Area
55651	Pinelog Sawmill Expansion, Moore Road Dardanup	S38 – Consultative Environmental Review	09/05/1992	EPA Bulletin 669 (1992)	N/A
100486	Greater Bunbury Region Scheme	S48A – Environmental Review	06/09/1996	EPA Bulletin 1108 (2003)	1-25
111262	Wool Scouring Operation	S38 – Not Assessed Public Advice Given	26/07/1997		6
116692	132kV Transmission Line through State Forrest Area	S38 – Not Assessed	24/10/1997		N/A
112647	Shire of Dardanup TPS 3 Amendment 90	S48A – Not Assessed Public advice Given	25/07/1997		6
114804	Service Station and associated cafeteria/restaurant	S38 – Not Assessed Pubic Advice Given	19/19/1997		17
128784	City of Bunbury TPS 6 Amendment 205	S48A – Not Assessed Public Advice Given	07/08/1998		N/A
133043	132kV Transmission Line	S38 – Not Assessed	13/11/1998		N/A
126788	Greater Bunbury Industrial Land and Port Access Planning	S16 – Report	12/06/1998	EPA Bulletin 902 (1998)	1-25
143942	Shire of Dardanup TPS3 Amendment 104	S48 – Not Assessed Public Advice Given	10/09/1999		N/A
165236	Shire of Dardanup TPS7 Amendment 2	S48 – Not Assessed Public Advice Given	26/02/2001		7
187034	Clearing for approximately 28 hectares of native Vegetation for Cattle	S38 – Proposal Unlikely to be Environmentally Acceptable	19/05/2003	EPA Bulletin 1112 (2003)	7
203821	Bunbury International Motorsports Complex	S38 – Assessment on Referral Information	29/03/2004	EPA Bulletin 1129 (2004)	14

203179	Shire of Dardanup TPS 7 Amendment 4	S48A - Not Assessed Public Advice Given	22/12/2003		7
211763	Shire of Dardanup TPS3 Amendment 134	S48A – Not Assessed	14/02/2005		6
212119	Shire of Dardanup TPS3 Amendment 128	S48A - Not Assessed Public Advice Given	28/02/2005		N/A
212385	Shire of Dardanup TPS3 Amendment 134	S48A - Not Assessed Public Advice Given	14/03/2005		N/A
217345	Shire of Dardanup TPS3 Amendment 134	S48A - Not Assessed	27/02/2006		N/A
219731	Dampier to Bunbury Natural Gas Pipeline Stage 5 Expansion	S38 – Assessment on Referral Information	03/10/2006	Bulletin 1231 (2006)	N/A
220544	Subdivision Lot 3 Harris Road Picton East.	S38 – Not Assessed Public Advice Given	05/11/2007		7
220954	Shire of Dardanup TPS 3 Amendment 151	S48A – Environmental Review	21/05/2007	Assessment in progress	14, 10
221053	City of Bunbury TPS 7 Amendment 18	S48A – Environmental Review	13/08/2007	Assessment in progress	21
221096	Subdivision Lot 5 Boyanup Picton Road, Picton East	S38 – LOA yet to be determined			14
	Pine Sawmill, Dardanup – Noise Regulation 17 Variation to assigned noise Levels			EPA Bulletin 1062 (2002)	
220979	Shire of Dardanup TPS 3 Amendment 135	S48A - Not Assessed Public Advice Given	12/12/2007		23,12
**Please note this table does not include proposals for which a Level of Assessment was set by the EPA but the proposal was subsequently withdrawn by the proponent.					

Appendix 5

List of vertebrate species recorded within Preston Industrial Park

Appendix 5. List of vertebrate species recorded from Investigation Areas (1-25) and for road verges, linkages and minor remnants (OP) in the Preston Industrial Estate project area. Data in column OP are combined from all DEC surveys. For list of conservation significant vertebrate fauna recorded in the Preston Industrial study area see Table 4.

X = species recorded by DEC during site inspections during 26-28 September and 9-11 October 2007; Y = species recorded by DEC during site inspections on 1 July 2003; E = species recorded during EPA visit on 14-15 February 2008; O = species recorded by Western Wildlife during 19-21 September 2006; H = data from HGM (2002); B indicates breeding record. NOTE: no data were available for Area 19 and there is no Area 20.

[illegible]

INVESTIGATION AREA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	21	22	23	24	25	OP
Family RECURVIROSTRIDAE																								
Black-winged Stilt																								
Family RALLIDAE																								
Purple Swampphen												X											X	+
Coot																								+
Family COLUMBIDAE																								
Laughing Dove																								+
Common Bronzewing		XO		E						XO	X	O	X		X						XO			+
Crested Pigeon				E							X	O										O		+
Family PSITTACIDAE																								
Red-tailed Black Cockatoo	XO		X		X	X	X			X	XO												X	+
Carnaby's Black Cockatoo	XO	X	X							OE	O												O	
Baudin's Black Cockatoo	X	X	X		X		X	X		E	XO					X	X					X		+
Galah								X							X						X			+
Corella							X				X										X			+
Red-capped Parrot	XO	XO	X	E	X	XO	X	X		OE	XO		X		O	H	OX		X		X	XO	O	+
Australian Ringneck	X	XO	X	XO E	X	XO	X	X		XO YE	X		X	X	O	H	X		X	X	XO	O		+
Western Rosella		X																						+
Elegant Parrot		X																						
Family CUCULIDAE																								
Fan-tailed Cuckoo															O									
Horsfield's Bronze Cuckoo																						O		
Shining Bronze Cuckoo										O	X					H	X				X	X	O	
Family MEROPIDAE																								
Rainbow Bee-eater										E														+
Family HALCYONIDAE																								
Laughing Kookaburra	XO	X									XO				X	H	O				X	XB		+
Sacred Kingfisher						O		X								X	X							+
Family MALURIDAE																								
Splendid Fairy-wren	X	XO E	X	XO		X			Y	XO	XO		X	X		XH								+
Family PARDALOTIDAE																								
Spotted Pardalote		O																						
Striated Pardalote	XB	XO						X		XO	X				XO	H						XO	O	+
Family ACANTHIZIDAE																								
White-browed Scrubwren	X								Y	XO	O			X	O									
Weebill		O						X																
Western Gerygone	XO	XO	X	XO	X	XO	X	XY	O	XO	XO	O	X	X		XH	X				X	XO		+
Inland Thornbill	XO	XE	X	XO E		O	XB	XY	Y	X	XO		X	X		XB H	X				X	X		+

INVESTIGATION AREA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	21	22	23	24	25	OP
Yellow-rumped Thornbill	XO B	X		XO	XB	XO	X	X	YO	XO	XO	O				XB H	X					XO		+
Family MELIPHAGIDAE																								
Red Wattlebird	XO	XO		X	X	O	X	XY		O	XO				XO	H	XO		X		X	O	O	+
Brown Honeyeater	XO	XO	X	XO E		XO	X	Y		O	XO	X	X		XO	H						XO		+
New Holland Honeyeater		O					X															X		+
White-cheeked Honeyeater																								
Tawny-crowned Honeyeater		X																						
Western Spinebill	X	XO	X						Y	O														
Family PETROICIDAE																								
Scarlet Robin	XO	XO	XB	XO						O	X					XH								
Western Yellow Robin			X						Y	E	XO													

INVESTIGATION AREA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	21	22	23	24	25	OP
Family PACHYCEPHALIDAE																								
Golden Whistler	XO	XO	X	O				Y	Y	XO Y	X			X										+
Rufous Whistler	X	XO	X	X	X	XO		XY		O	XO		X			H	X				X	XO		+
Grey Shrike-thrush	O	O		O						O	O					H								
Family DICURIDAE																								
Magpie-lark				E				X								OH	X						O	+
Grey Fantail	XO	XO	X	XO E		XO	X	XY	OY	XO E	X		X		X	OH	X				O	XO		+
Willie Wagtail		X		E		X		X							X					X	X		O	+
Family CAMPEPHAGIDAE																								
Black-faced Cuckoo-shrike	XO	XO			X			X	Y	XY					X	H			X		X			+
White-winged Triller																								+
Family CRACTICIDAE																								
Grey Butcherbird				X	X	XO		XY	Y	X	X		X	X	X	H	X				XO		O	+
Australian Magpie	X	O		X	X	X	X	XY		O	X					XB					X	X	O	+
Family CORVIDAE																								
Australian Raven	XB O	XO	X	XO E		XO	X	XB	OY	XO	XO		X	X	X	XO HB				X	XO		O	+
Family ZOSTEROPIDAE																								
Silvereye	XO	XO	X	XO		X		XY		O	X					OH	O					XO	O	+
Family ARTAMIDAE																								
Black-faced Woodswallow								X																+
Dusky Woodswallow		X																						
Family HIRUNDINIDAE																								
Welcome Swallow		X					X	X	Y						X	H								+

[illegible]

Appendix 6

Natural Area Assessment Sheets Preston Industrial Park

Appendix 6

Natural Area Assessment Sheets Preston Industrial Park

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 1
Location	Lots 2 on diagram 78828 Picton East, Lot 84 on plan 29208 Picton East and Lot 40 on plan 232800 Taverner Road Picton East
Size (ha)	88 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning -GBRS	Rural, Primary Regional Roads

Environmental Considerations - Natural Attributes	
Landforms	
<i>Southern River Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2003); GHD (2002); DEC (2007).
Summary of findings	<p>Southern River Complex Vegetation:</p> <p><u>Unit 1 (Bennett 2003, 1.1i)</u> Low Open Woodland of <i>Banksia attenuata</i> over Closed Tall Scrub of <i>Kunzea glabrescens</i> over a Sedgeland of <i>Loxocarya cinerea</i>, <i>Phlebocarya ciliata</i> and <i>Conostylis aculeata</i> in grey sand.</p> <p><u>Unit 2 (GHD 2002, Area 7)</u> Woodland of <i>Melaleuca raphiophylla</i> over Open Herbland of <i>Triglochin ?lineare</i> fringed by Woodland of <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> with Emergent <i>Banksia littoralis</i> over shrubs and herbs.</p> <p><u>Unit 3 (DEC 2007, 1.1)</u> Open Woodland of <i>Eucalyptus marginata</i> and <i>Banksia attenuata</i> over Closed Tall Scrub of <i>Jacksonia furcellata</i> and <i>Melaleuca thymoides</i> over shrubs and herbs.</p> <p><u>Unit 4 (DEC 2007, 1.3)</u> Woodland of <i>Melaleuca preissii</i> with Emergent <i>Banksia littoralis</i> over Tall Shrubland of <i>Pericalymma ellipticum</i> and <i>Astartea fascicularis</i>.</p>

	<p><u>Unit 5 (DEC 2007, 1.4)</u> Woodland of <i>Corymbia calophylla</i> over <i>Banksia ilicifolia</i>, <i>Banksia grandis</i> and <i>Agonis flexuosa</i>.</p> <p><u>Unit 6 (DEC 2007, 1.8)</u> Woodland of <i>Melaleuca raphiophylla</i> over Open Shrubland of <i>Astartea fascicularis</i> and sedges fringed by Woodland of <i>Melaleuca preissiana</i>.</p> <p>Vegetation Condition: <u>Unit 1</u> Good to Very Good <u>Unit 2</u> Very Good <u>Unit 3</u> Very Good to Excellent <u>Unit 4</u> Excellent <u>Unit 5</u> Degraded <u>Unit 6</u> Good</p> <p>Total Flora: 69 native taxa, 20 weed taxa Significant Flora: <i>Acacia flagelliformis</i> (P4), <i>Aponogeton hexatepalus</i> (P4), <i>Verticordia attenuate</i> (P3), <i>Villarsia submerse</i> (P4); poorly reserved flora <i>Patersonia umbrosa</i></p>
Vegetation & Flora Survey Limitations	Bennett (2003) survey undertaken 16-06-2003 and 17-06-2003, some specimens found to be too small for positive identification, revee sites no GPS. GHD (2002) survey undertaken 27-02-2002, assessment based on aerial interpretation and brief site visit, revee sites no GPS. DEC (2007) survey undertaken 26-09-2007, revee sites no plots.
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a*
National/International Significance	No, but regionally significant
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Thirty-one bird species recorded including three threatened species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Carnaby's Black Cockatoo) and nine species listed as conservation significant on the Swan Coastal Plain (Brown Goshawk, Splendid Fairy-wren, White-browed Scrubwren, Broad-tailed Thornbill, Yellow-rumped Thornbill, Western Spinebill, Scarlet Robin, Golden Whistler, Grey Shrike-thrush.) Four native

	mammal species including threatened Western Ringtail Possum and Quenda. Three amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Three Schedule 1 bird species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum) one Priority fauna species (Quenda). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetland
Management Category	2 Conservation Category, 3 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		YES
Regional vegetation representation		
Vegetation Complexes	Southern River	
Floristic Community types	21a*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, and Marri and Peppermint Woodland	
Size and Shape >20ha (88ha), is a preferable compact shape; circle square or squat rectangle, and is adjacent to other remnants to the south, east and west		
Vegetation Condition The area is predominantly in Very Good Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	The area consists of two Conservation Category wetland	
Other regionally significant naturally vegetated areas	Adjacent to west Investigation area 2 is regionally significant. Adjacent to south Investigation area 3 is regionally significant.	
Contains areas suitable for ecological restoration	Water treatment plant could be restored as artificial wetland	
Comment:		
Diversity		YES
Landforms	Bassendean Dunes and Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	1	
Vegetation units	8	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands.	
Fauna	High fauna diversity (relatively large area, vegetation in good condition).	

Comment:	
Rarity	YES
Vegetation Complex <10% remaining	No
Threatened Ecological Communities	None
Flora	4 Priority flora: <i>Acacia flagelliformis</i> (P4), <i>Aponogeton hexatepalus</i> (P4), <i>Verticordia attenuate</i> (P3), <i>Villarsia submerse</i> (P4). 1 poorly reserved flora <i>Patersonia umbrosa</i>
Habitats	The six different vegetation units are significant habitat for Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Western Ringtail Possum, Quenda, and at least nine conservation significant Swan Coastal Plain bird species.
Fauna	Four Schedule 1 species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Western Ringtail Possum), one Priority species (Quenda). Nine conservation significant Swan Coastal Plain bird species (Brown Goshawk, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Western Spinebill, Scarlet Robin, Golden Whistler, Grey Shrike-thrush)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	None
<i>Contains areas suitable for ecological restoration</i>	Water treatment plant could be restored as artificial wetland
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	
YES	
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 5 criteria: Representation, Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 2
Location	Lot 4 on diagram 71939 Picton East, and Part Lots 42 and 43 on plan 232805, Picton East and Part Lot 1 on diagram 71887 Temple Road Picton and Lot 44 on plan 232805 Temple Road Picton
Size (ha)	72 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming and Industry
Current zoning - GBRS	Rural and Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean and Spearwood Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005); DEC (2007).
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (Bennett 2005, PCRA)</u> Tall Open Scrub of <i>Pericalymma ellipticum</i> over Low Open Shrubland of mixed species.</p> <p><u>Unit 2 (Bennett 2005, PCRB)</u> Low Open Forest of <i>Banksia ilicifolia</i> and <i>Kunzea glabrescens</i> with emergent <i>Corymbia calophylla</i> over a Sedgeland.</p> <p><u>Unit 3 (Bennett 2005, PC1)</u> Low Open Forest of <i>Banksia attenuata</i>, <i>Corymbia calophylla</i>, <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Xylomelum occidentale</i> over a Tall Open Scrub of <i>Melaleuca thymoides</i> over an Open Sedgeland.</p> <p><u>Unit 4 (Bennett 2005, PC2 and PC4)</u> Scattered <i>Eucalyptus marginata</i> subsp. <i>marginata</i> with Emergent <i>Corymbia calophylla</i> over Low Open Forest of <i>Banksia ilicifolia</i> and <i>Kunzea glabrescens</i> over a Sedgeland.</p>

	<p><u>Unit 5 (Bennett 2005, PC3)</u> Low Open Woodland of <i>Banksia littoralis</i> and <i>Melaleuca preissiana</i> over a Tall Open Scrub of <i>Acacia saligna</i> over a Grassland dominated by <i>Cyathochaeta avenacea</i>.</p> <p><u>Unit 6 (Bennett 2005, PC5)</u> Tall Open Scrub of <i>Melaleuca preissiana</i> and <i>Kunzea glabrescens</i> over litter.</p> <p><u>Unit 7 (DEC 2007, 2.6)</u> Woodland of <i>Melaleuca raphiophylla</i> with Emergent <i>Banksia littoralis</i> over Closed Heath of <i>Hypocalymma angustifolium</i> and <i>Hakea varia</i> over a Sedgeland.</p> <p>Karrakatta Central and South Complex Vegetation: <u>Unit 8 (DEC 2007, Bec to do)</u> Spearwood Shrubland in western portion of Area 2.</p> <p>Vegetation Condition: <u>Unit 1</u> Very Good <u>Unit 2</u> Good to Very Good <u>Unit 3</u> Very Good <u>Unit 4</u> Good to Very Good, with patches of Degraded <u>Unit 5</u> Good <u>Unit 6</u> Very Good <u>Unit 7</u> Excellent <u>Unit 8</u> Excellent</p> <p>Total Flora: 292 native taxa, 31 weed taxa Significant Flora: <i>Acacia flagelliformis</i> (P4), <i>Verticordia attenuata</i> (P3), <i>Pultenaea skinneri</i> (P4). Poorly Reserved Flora: <i>Lepidosperma striatum</i>, <i>Lepyrodia glauca</i>, <i>Meeboldina scariosa</i>, <i>Patersonia umbrosa</i>, <i>Tetradlea setigera</i></p>
Vegetation & Flora Survey Limitations	<p>Bennet (2005) survey undertaken 24th to 27th of March 2004 with follow up spring survey 20th to 23rd October 2004. Flora collected was not compared to the collections at the Western Australian Herbarium. Survey method included both 10x10 and GPS coordinates and relevee sites with no GPS coordinates.</p> <p>DEC (2007) survey undertaken 26th September 2007 limited to verification of Bennett (2005) and Ecoscape (2007) surveys.</p>
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp. and 6: Medium Woodland; Tuart and Jarrah
Floristic Community Types (FCT) *type inferred	21a* & 4*
National/International	No, but Regionally significant

Significance	
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during 26-28 September and 9-11 October 2007.
Summary of findings	Thirty-four bird species recorded including two threatened species (Baudin's Black Cockatoo and Carnaby's Black Cockatoo) and 13 species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Western Rosella, Splendid Fairy-wren, Weebill, Inland Thornbill, Yellow-rumped Thornbill, New Holland Honeyeater, Tawny-crowned Honeyeater, Western Spinebill, Scarlet Robin, Golden Whistler, Grey Shrike-Thrush, and Dusky Woodswallow). Three native mammal species including threatened Western Ringtail Possum. One amphibian species.
Fauna Survey Limitations	Site was visited briefly by Western Wildlife as part of a short site visit and the DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Two Schedule 1 bird species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species are likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetland
Management Category	2 Conservation Category, 1 Resource Enhancement and 1 Multiple Use.
Suite	N/A see Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		YES
Regional vegetation representation		
Vegetation Complexes	Southern River and Karrakatta Central and South	
Floristic Community types	21a* & 4*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, and Marri and Peppermint Woodland	
Size and Shape		
>20ha (72ha), is a preferable compact shape; oval, rectangle, or symmetrical triangle , and is close to two other remnants to the east and south		
Vegetation Condition		
The area is predominantly in Good to Very Good Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	The area consists of 2 Conservation Category wetlands	

Other regionally significant naturally vegetated areas	Adjacent to east Investigation area 1 is regionally significant. Adjacent to south Investigation area 4 is regionally significant.
<i>Contains areas suitable for ecological restoration</i>	No
Comment: Large area in Very Good condition	
Diversity	YES
Landforms	Interface between Bassendean and Spearwood Dunes, and combination of Bassendean Dunes with Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	7
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands
Fauna	High fauna diversity including threatened species and regionally significant declining species (relatively large area, vegetation mostly in excellent condition).
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	No
Threatened Ecological Communities	None
Flora	3 Priority Flora: <i>Acacia flagelliformis</i> , <i>Verticordia attenuata</i> , <i>Pultenaea skinneri</i> 5 Poorly Reserved Flora: <i>Lepidosperma striatum</i> , <i>Lepyrodia glauca</i> , <i>Meeboldina scariosa</i> , <i>Patersonia umbrosa</i> , <i>Tetralthea setigera</i>
Habitats	The seven vegetation units are significant habitat for Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Western Ringtail Possum, and at least 13 conservation significant Swan Coastal Plain bird species.
Fauna	Three Schedule 1 species (Baudin's Black Cockatoo, Carnaby's Black Cockatoo and Western Ringtail Possum), and at least 13 bird species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Western Rosella, Splendid Fairy-wren, Weebill, Inland Thornbill, Yellow-rumped Thornbill, New Holland Honeyeater, Tawny-crowned Honeyeater, Western Spinebill, Scarlet Robin, Golden Whistler, Grey Shrike-Thrush, and Dusky Woodswallow).
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i>	
Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	None
<i>Contains areas suitable</i>	No

<i>for ecological restoration</i>	
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	YES
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 5 criteria, being: Representation, Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 3
Location	Lot 2 on diagram 17429 Picton East
Size (ha)	15 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Southern River Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (DEC 2007, 3.1)</u> Tall Open Woodland of <i>Eucalyptus marginata</i> over Open Forest of <i>Banksia attenuata</i> and <i>B. ilicifolia</i> over Shrubland of <i>Hibbertia hypericoides</i>, <i>Stirlingia latifolia</i> and <i>Bossiaea eriocarpa</i> over Sedgeland and Herbland.</p> <p><u>Unit 2 (DEC 2007, 3.2)</u> Woodland of <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> over Mixed Shrubland.</p> <p><u>Unit 3 (DEC 2007, 3.3)</u> Open Forest of <i>Melaleuca preissiana</i> with Emergent <i>Banksia littoralis</i> over Shrubland of <i>Hypocalymma angustifolium</i> over Sedgeland.</p> <p><u>Unit 4 (DEC 2007, 3.4)</u> Tall Open Woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over Open Forest of <i>Banksia attenuata</i> and <i>B. ilicifolia</i> over Mixed Open Shrubland over Herbland.</p>

	Vegetation Condition: <u>Unit 1</u> Good <u>Unit 2</u> Very Good <u>Unit 3</u> Excellent <u>Unit 4</u> Good Total Flora: Not assessed Significant Flora: Not assessed
Vegetation & Flora Survey Limitations	Inspected by Ecoscape (2006) but no reference sites established. DEC (2007) site visit undertaken 28-09-2007, no plots.
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a* and 4*
National/International Significance	No, but regionally significant
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Seventeen bird species recorded including three threatened species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Carnaby's Black Cockatoo) and six species listed as conservation significant on the Swan Coastal Plain (Splendid Fairy-wren, Inland Thornbill, Western Spinebill, Scarlet Robin, Western Yellow Robin, and Golden Whistler). Three native mammal species including threatened Western Ringtail Possum. Two amphibian species.
Fauna Survey Limitations	Site not visited by Western Wildlife due to restricted access and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Three Schedule 1 bird species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetland
Management Category	1 Multiple Use that is a likely Conservation Category
Suite	N/A See Semeniuk 1998 Vol 2B
Conclusions from survey	Dampland UFI 1551 is currently identified as Multiple Use management category in the Geomorphic Wetlands Swan Coastal Plain dataset (2007), however the management category is currently subject to review by DEC due to new information on wetland values. Also note the boundary in the GWSCP dataset

	requires correction.
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Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River	
Floristic Community types	21a* & 4*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, and Stout Paperbark Woodland,	
Size and Shape <20ha (15ha), is an irregular shape with indentations, is close to three other remnants to the east and south.		
Vegetation Condition The area is predominantly in Excellent Condition.		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	None	
Other regionally significant naturally vegetated areas	Areas 1 and 2 directly north, Area 4 directly west	
Contains areas suitable for ecological restoration	sand quarry enclosed by remnant	
Comment:		
Diversity		YES
Landforms	Southern River Complex: Bassendean B2 phase, Bassendean B6 phase	
Vegetation Complexes	1	
Floristic Community Types	2	
Vegetation units	4	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands.	
Fauna	Relatively high fauna diversity including four threatened species and at least six regionally significant declining bird species (relatively small area, vegetation in excellent condition)	
Comment:		
Rarity		YES
Vegetation Complex <10% remaining	No	
Threatened Ecological Communities	None	
Flora	Not assessed	
Habitats	The four vegetation units are significant habitat for Red-tailed Black Cockatoo, Carnaby’s Black Cockatoo, Baudin’s Black Cockatoo, Western Ringtail Possum, and at least six conservation significant Swan Coastal Plain bird species.	
Fauna	Four Schedule 1 species recorded (Red-tailed Black Cockatoo, Carnaby’s Black Cockatoo, Baudin’s Black Cockatoo, Western Ringtail Possum), and at least six bird species listed as	

	conservation significant on the Swan Coastal Plain (Splendid Fairy-wren, Inland Thornbill, Western Spinebill, Scarlet Robin, Western Yellow Robin, and Golden Whistler).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	None
<i>Contains areas suitable for ecological restoration</i>	Includes a sand quarry.
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	
Comment: Has likely Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria, being: Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 4
Location	Lot 2010 on diagram 43721 Picton East, Lots 42 and 43 on plan 232805, Picton East and Lot 1 on diagram 71887 Temple Road Picton
Size (ha)	106 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Southern River Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005), DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (Bennett 2005, PC6)</u> Shrubland of <i>Astartea scoparia</i> over Sedgeland of <i>Juncus pallidus</i> fringed with <i>Melaleuca preissiana</i>.</p> <p><u>Unit 2 (Bennett 2005, PC7)</u> Woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Corymbia calophylla</i> over Shrubland dominated by <i>Xanthorrhoea brunonis</i> over a Grassland of weeds.</p> <p><u>Unit 3 (Bennett 2005, PC8)</u> Low Woodland of <i>Melaleuca preissiana</i> and <i>Banksia littoralis</i> over an Open Heath of <i>Pericalymma ellipticum</i> and <i>Xanthorrhoea brunonis</i> subsp. <i>brunonis</i> over an Open Grassland/Open Sedgeland of <i>Loxocarya cinerea</i>.</p> <p><u>Unit 4 (Bennett 2005, PC9)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i> over a Closed Sedgeland of mixed species.</p>

	<p><u>Unit 5 (Bennett 2005, PCRC)</u> Low Open Woodland of <i>Melaleuca raphiophylla</i> over Tall Open Scrub of <i>Melaleuca teretifolia</i> over a Herbland of <i>Cotula coronopifolia</i> and Grassland of *<i>Cynodon dactylon</i>.</p> <p><u>Unit 6 (DEC 2007, 4.1)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i> over a Tall Open Scrub of <i>M. lateritia</i> and <i>M. viminea</i> with Emergent <i>Hakea varia</i>.</p> <p><u>Unit 7 (DEC 2007, 4.2)</u> Woodland of <i>Corymbia calophylla</i> over Low Open Forest of <i>Agonis flexuosa</i> over Shrubland of <i>Xanthorrhoea preissii</i> and <i>Hypocalymma angustifolium</i>.</p> <p><u>Unit 8 (DEC 2007, 4.3)</u> Woodland of <i>Banksia attenuata</i>, <i>B. grandis</i> and <i>Agonis flexuosa</i> with Emergent <i>Corymbia calophylla</i> over Mixed Shrubland and Herbland of <i>Dasypogon bromeliifolius</i>.</p> <p>Vegetation Condition: <u>Unit 1</u> Degraded <u>Unit 2</u> Good <u>Unit 3</u> Good to Very Good <u>Unit 4</u> Good to Very Good <u>Unit 5</u> Good to Degraded <u>Unit 6</u> Good <u>Unit 7</u> Very Good <u>Unit 8</u> Good</p> <p>Total Flora: 71 native species, 36 weeds Significant Flora: <i>Pultenaea skinneri</i> (P4), <i>Acacia flagelliformis</i> (P4) Poorly Reserved Flora: <i>Patersonia umbrosa</i></p>
Vegetation & Flora Survey Limitations	Bennett (2005) survey undertaken 24 to 27 of March 2004 with follow up spring survey 20 to 23 October 2004. Flora collected was not compared to the collections at the Western Australian Herbarium. Survey method included both 10x10 and GPS coordinates and relevee sites with no GPS coordinates. DEC (2007) survey undertaken 28 September 2007 and 9 October 2007, relevee sites no plots
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a* & 4*
National/International Significance	No
Fauna	
Area Specific	

Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007 and February 2008.
Summary of findings	Twenty-three bird species recorded including eight species listed as conservation significant on the Swan Coastal Plain (Little Eagle, Common Bronzewing, Splendid Fairy-wren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, Golden Whistler and Grey Shrike-Thrush). Two native mammal species including threatened Quenda. One reptile species and two amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Priority mammal species (Quenda). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	3 Conservation Category, 1 Resource Enhancement, 4 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River	
Floristic Community types	21a* & 4*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, and Marri and Peppermint Woodland	
Size and Shape		
>20ha (106ha), is a preferable compact rectangular shape; close to three other remnants to the north, east and south.		
Vegetation Condition		
The area is predominantly in Good Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated 1 Conservation Category wetland Remnant 1 and 2 directly north	
Protected areas		
Other regionally significant naturally vegetated areas		
Contains areas suitable for ecological restoration	Yes much of remnant previously grazed	
Comment:		
Diversity		YES
Landforms	Bassendean Dunes intersecting with Pinjarra Plain	

Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	8
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Medium to high fauna diversity (relatively large area, vegetation in good condition).
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	No
Threatened Ecological Communities	None
Flora	2 Priority taxa; <i>Pultenaea skinneri</i> , <i>Acacia flagelliformis</i> . Poorly Reserved Flora; <i>Patersonia umbrosa</i> .
Habitats	The eight vegetation units are significant habitat for the threatened mammal species, Quenda, and at least eight conservation significant declining bird species.
Fauna	One Priority 5 species (Quenda) and at least eight bird species listed as conservation significant on the Swan Coastal Plain (Little Eagle, Common Bronzewing, Splendid Fairy-wren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, Golden Whistler, and Grey Shrike-thrush).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	None
<i>Contains areas suitable for ecological restoration</i>	yes much of remnant previously grazed
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria: Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 5
Location	Lot 44 on plan 232805 Temple Road and Lot 45 on plan 232805 Wimbridge Road, Picton
Size (ha)	46 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry
Current zoning - GBRS	Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Southern River Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation:</p> <p><u>Unit 1 (DEC 2007, 5.1)</u> Open Forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over Low Open Shrubland of <i>Dasypogon bromeliifolius</i> and <i>Xanthorrhoea brunonis</i> over Very Open Sedgeland of <i>Desmocladius flexuosus</i>.</p> <p><u>Unit 2 (DEC 2007, 5.2)</u> Low Open Woodland of <i>Melaleuca raphiophylla</i> over Shrubland of <i>Kunzea glabrescens</i>.</p> <p><u>Unit 3 (DEC 2007, 5.3)</u> Open Woodland of <i>Eucalyptus rudis</i>, <i>E. marginata</i> and <i>Corymbia calophylla</i> over Low Open Woodland of <i>Melaleuca preissiana</i> over Open Grassland and Open Herbland.</p> <p><u>Unit 4 (DEC 2007, 5.4)</u> Sedgeland of <i>Juncus pallidus</i> over Herbland of <i>Cotula coronipifolia</i>.</p> <p><u>Unit 5 (DEC 2007, 5.5)</u></p>

	<p>Open Woodland of <i>Eucalyptus marginate</i>, <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> over Low Woodland of <i>Banksia attenuata</i>, <i>B. illicifolia</i> and <i>B. grandis</i> over Tall Shrubland of <i>Kunzea glabrescens</i> over Shrubland of <i>Dasypogon bromeliifolius</i> and <i>Xanthorrhoea brunonis</i> over Very Open Sedgeland.</p> <p>Vegetation Condition: <u>Unit 1</u> Degraded <u>Unit 2</u> Degraded to Good <u>Unit 3</u> Degraded <u>Unit 4</u> Degraded <u>Unit 5</u> Good</p> <p>Total Flora: Not assessed Significant Flora: Not assessed</p>
Vegetation & Flora Survey Limitations	DEC (2007) site visit undertaken 26 September 2007, relevee only no plots.
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. And 6: Medium Woodland; tuart and jarrah
Floristic Community Types (FCT) *type inferred	Not assessed
National/International Significance	No
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Twelve bird species recorded including two threatened species (Red-tailed Black Cockatoo, and Baudin's Black Cockatoo) and two species listed as conservation significant on the Swan Coastal Plain (Little Eagle, and Yellow-rumped Thornbill). One native mammal species. Two reptile species and three amphibian species.
Fauna Survey Limitations	Site not visited by Western Wildlife due to restricted access and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Two Schedule 1 bird species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River	
Floristic Community types	NA	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands	
Size and Shape		
>20ha (46ha), is irregular shape with few indentations, and is close to two other remnants to the north and east.		
Vegetation Condition		
The area is a combination of Good and Degraded condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	None	
Other regionally significant naturally vegetated areas	Investigation area 2 directly north and 4 to east, both are regionally significant.	
Contains areas suitable for ecological restoration	yes as most of remnant has previously been grazed	
Comment:		
Diversity		NO
Landforms	Spearwood Dunes, Bassendean Dunes and Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	NA	
Vegetation units	NA	
Flora	Wetland and upland diversity	
Habitats	Uplands only.	
Fauna	Medium fauna diversity (relatively small area, mostly Degraded vegetation)	
Comment:		
Rarity		YES
Vegetation Complex <10% remaining	No	
Threatened Ecological Communities	NA	
Flora	NA	
Habitats	The five vegetation units are significant habitat for two threatened species (Red-tailed Black Cockatoo and Baudin’s Black Cockatoo) and two bird species listed as conservation significant on the Swan Coastal Plain (Little Eagle and Yellow-rumped Thornbill	
Fauna	Two Schedule 1 species recorded: (Red-tailed Black Cockatoo, Baudin’s Black Cockatoo). At least two bird species listed as conservation significant on the Swan Coastal Plain (Little Eagle and Yellow-rumped Thornbill). Other threatened species likely to occur.	
Comment:		

Maintaining Ecological Processes and Natural Systems		NO
<i>Relationship/proximity to:</i>		
Regional Ecological Link	Part of a high and moderate priority potential linkage	
Creekline/River/Estuary	None	
<i>Contains areas suitable for ecological restoration</i>	yes as most of remnant has previously been grazed	
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities		
Comment:		
Scientific or Evolutionary Importance		NO
Comment:		
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation		NO
Comment:		

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 1 criteria, being: Rarity (habitat for Red-tailed Black Cockatoo, Baudin's Black Cockatoo) and regionally significant declining bird species.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 6
Location	Lot 61 on plan 11034 Picton East, Lots 104 and 105 on diagram 96, Picton East, Lot 1 on plan 232800, Martin Pelusey Road, Picton East and Lot 603 on plan 246179, Martin Pelusey Road, Picton East
Size (ha)	41 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S38 CRN111262, S48A CRN112647, S48A 211763.

Planning Considerations	
General	
Current zoning – Local	Restricted Use R2 and General Farming
Current zoning - GBRS	Industrial and Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Pinjarra Plain and Bassendean Dunes</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation: <u>Unit 1 (DEC 2007, 6.1)</u> Woodland of <i>Corymbia calophylla</i> over Low Woodland of <i>Agonis flexuosa</i>. <u>Unit 2 (DEC 2007, 6.2)</u> Open Woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over Low Open Forest of <i>Banksia attenuata</i>, <i>Agonis flexuosa</i> and <i>Banksia illicifolia</i> over Tall Shrubland of <i>Kunzea glabrescens</i>. Guildford Complex Vegetation: <u>Unit 3 (DEC 2007, 6.3)</u> Low Open Forest of <i>Melaleuca raphiophylla</i> and <i>M. preissiana</i> over Tall Open Shrubland of <i>M. lateritia</i>.</p>

	Vegetation Condition: <u>Unit 1</u> Degraded to Completely Degraded <u>Unit 2</u> Degraded <u>Unit 3</u> Good to Degraded Total Flora: Not assessed Significant Flora: <i>Verticordia attenuata</i> (P3)
Vegetation & Flora Survey Limitations	DEC (2007) site visit undertaken 10 October 2007, no plots.
Regional	
Vegetation Complex	Guilford and Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp. and 968: Medium Woodland; Jarrah, Marri and Wandoo
Floristic Community Types (FCT) *type inferred	21c* and 4*
National/International Significance	No, but regionally significant
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Twenty bird species recorded including one threatened species (Red-tailed Black Cockatoo) and four species listed as conservation significant on the Swan Coastal Plain (Wedge-tailed Eagle, Splendid Fairy-wren, Inland Thornbill, and Yellow-rumped Thornbill). Three amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 bird species (Red-tailed Black Cockatoo). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	YES
<i>Regional vegetation representation</i>	
Vegetation Complexes	Guilford and Southern River
Floristic Community types	21c* and 4*
Uplands and Wetlands	Both

Habitats	Jarrah and Banksia Woodlands, and Freshwater Paperbark Woodland
<i>Size and Shape</i> >20ha (41ha), is irregular shape with few indentations, and is close to two other remnants to the north and east	
<i>Vegetation Condition</i> The area is predominantly Degraded	
<i>Relationship/proximity to:</i> Naturally vegetated areas Protected areas Other regionally significant naturally vegetated areas	The area is naturally vegetated None Area 7 to the south west is regionally significant
<i>Contains areas suitable for ecological restoration</i>	yes as it is fragmented and much is Degraded to Completely Degraded
Comment: Although fragmented and Degraded, contributes to at least 10% Guildford complex	
Diversity NO	
Landforms	Bassendean Dunes and Pinjarra Plain
Vegetation Complexes	2
Floristic Community Types	2
Vegetation units	3
Flora	Wetland and upland diversity
Habitats	Uplands and Wetlands.
Fauna	Limited surveys indicate at least moderate to high fauna diversity
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	Yes Guildford Complex
Threatened Ecological Communities	NA
Flora	NA
Habitats	The three vegetation units are significant habitat for Red-tailed Black Cockatoo, and at least four conservation significant Swan Coastal Plain bird species.
Fauna	One Schedule 1 species recorded (Red-tailed Black Cockatoo) and at least four species listed as conservation significant on the Swan Coastal Plain (Wedge-tailed Eagle, Splendid Fairy-wren, Inland Thornbill, and Yellow-rumped Thornbill).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link Creekline/River/Estuary	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage) None
<i>Contains areas suitable for ecological restoration</i>	yes as much of the remnant is degraded to completely degraded

<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	NO
Comment:	

<i>SUMMARY NATURAL VALUES</i>	
<i>Regional Significance - Assessment area against the Criteria</i>	
The area meets 3 criteria, being: Representation, Rarity and Maintaining Ecological Processes and Natural Systems	

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 7
Location	Lots 104 and 102 on diagram 96, Picton East, Lot 200 on plan 34987 Picton East, Lot 3 on diagram 50159 (Harris Road), Picton East, Lot 0 on plan 529, Picton East, Lot 100 on diagram 88, Harris Road, Picton East and Lot 87 on plan 13869 Picton East
Size (ha)	38 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	<i>Environmental Protection (Swan Coastal Lakes) Policy 1992</i> (EPP Lake)
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S38 EPA Bulletin 1112 (2003), S48A CRN165236, S48A CRN.203179, S38 CRN220544.

Planning Considerations	
General	
Current zoning – Local	Restricted Use R2, Additional Use A4, General Farming Light Industrial, General Industry and Public Open Space
Current zoning - GBRS	Industrial and Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007) roadside assessment only due to access constraints
Summary of findings	Guildford Complex Vegetation: <u>Unit 1</u> (DEC 2007, 7.1) Low Woodland of <i>Melaleuca raphiophylla</i> over Open Herbland and Grassland. <u>Unit 2</u> (DEC 2007, 7.2) Low Open Forest of <i>Agonis flexuosa</i> and <i>Corymbia calophylla</i> over Mixed Shrubland over Very Open Herbland of <i>Dasypogon bromeliifolius</i> and <i>Phlebocarya ciliata</i> . Vegetation Condition: <u>Unit 1</u> Good <u>Unit 2</u> Good to Very Good Total Flora: Not assessed Significant Flora: Not assessed

Vegetation & Flora Survey Limitations	DEC (2007 roadside assessment only on 10 October 2007 due to access constraints. Additional wetland and upland units inferred from aerial were not observable from roadside, particularly within Lot 200 Harris Road.
Regional	
Vegetation Complex	Guildford Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. And 968: Medium Woodland; jarrah, marri and wandoo
Floristic Community Types (FCT) *type inferred	4* and 21a*
National/International Significance	No, but recognised as Regionally significant
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Nineteen bird species recorded including two threatened species (Red-tailed Black Cockatoo and Baudin's Black Cockatoo) and three species listed as conservation significant on the Swan Coastal Plain (Inland Thornbill, Yellow-rumped Thornbill, and New Holland Honeyeater). Two native mammal species including threatened Western Ringtail Possum. Three amphibian species.
Fauna Survey Limitations	Site not visited by Western Wildlife due to restricted access and DEC site visit was opportunistic only. A comprehensive survey would significantly increase the number of species confirmed on the site especially wetland birds and amphibian species.
Regional	
National/International Significance	Two Schedule 1 bird species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Resource Enhancement, 2 Multiple Use, 1 Not Assessed, 1 EPP Lake. 2 of the wetlands are likely to be Conservation Category
Suite	N/A See Semeniuk 1998 Vol 2B
Conclusions from survey	The RE and NA wetlands appear to have higher values than previously recognised in the GWSCP dataset and are recommended for review.

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	YES
<i>Regional vegetation representation</i>	
Vegetation Complexes	Guildford Complex
Floristic Community types	NA

Uplands and Wetlands	Both
Habitats	Marri and Peppermint Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, Herblands and Grasslands
<i>Size and Shape</i> >20ha (38ha), is mostly consolidated, with additional irregular shaped areas, is close to two other remnants to the north and south	
<i>Vegetation Condition</i> The area is predominantly of Very Good	
<i>Relationship/proximity to:</i> Naturally vegetated areas Protected areas Other regionally significant naturally vegetated areas	The area is naturally vegetated EPP Lake Is regionally significant and has the Ferguson River to the south which is also recognised as regionally significant
<i>Contains areas suitable for ecological restoration</i>	yes as parts of remnant completely degraded
Comment:	
Diversity NO	
Landforms	Bassendean Dunes and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	>2
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	High fauna diversity.
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	Yes: Guildford Complex
Threatened Ecological Communities	Not assessed
Flora	Not assessed
Habitats	Low Open Forest of <i>Agonis flexuosa</i> and <i>Corymbia calophylla</i> is significant habitat for threatened species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Western Ringtail Possum) <i>Melaleuca raphiophylla</i> Woodland wetlands are significant habitat for threatened Western Ringtail Possum and regionally significant bird species.
Fauna	Three Schedule 1 species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Western Ringtail Possum) and at least three species listed as conservation significant on the Swan Coastal Plain (Inland Thornbill, Yellow-rumped Thornbill, and New Holland Honeyeater).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin

Creekline/River/Estuary	Rivers/Preston River/Gwindinnup – north-south ecological linkage) Ferguson River to the south
<i>Contains areas suitable for ecological restoration</i>	yes as parts of remnant completely degraded
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	
Comment: Has 1 EPP Lake and likely Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria, being: Representation of Ecological Communities, Rarity, Maintaining Ecological Processes and Natural Systems & General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation. Previously assessed by EPA as regionally significant.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 8
Location	Various Lots - Ferguson and Preston River
Size (ha)	107 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Parks and Recreation, Recreation and General Farming
Current zoning - GBRS	Regional Open Space

Environmental Considerations - Natural Attributes	
Landforms	
<i>Swan Complex, Southern River and Guilford Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005), GHD (2002), DEC (2007)
Summary of findings	<p>Swan Complex, Southern River and Guilford Complex Vegetation</p> <p><u>Unit 1 (Bennett 2005, PC10)</u> Open Forest or Open Woodland of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Open Forest or Low Open Woodland of <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> and <i>Melaleuca raphiophylla</i> over a Herbland/Grassland.</p> <p><u>Unit 2 (Bennett 2005, PC11)</u> Open Forest or Open Woodland of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Open Forest or Low Open Woodland of <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> and <i>Melaleuca raphiophylla</i> over a Herbland/Grassland.</p> <p><u>Unit 3 (Bennett 2005, PC14)</u> Open Forest or Open Woodland of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Open Forest or Low Open Woodland of <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> and <i>Melaleuca raphiophylla</i> over a Herbland/Grassland.</p> <p><u>Unit 4 (Bennett 2005, PC16)</u> Woodland of <i>Agonis flexuosa</i> subsp. <i>flexuosa</i>, <i>Banksia attenuata</i>,</p>

	<p><i>B. ilicifolia</i> and <i>Kunzea glabrescens</i> over a Sedgeland or bare ground. <u>Unit 5</u> (GHD 2002, Area 6) Woodland of <i>Eucalyptus rudis</i> and <i>Agonis flexuosa</i> over scattered <i>Pteridium esculentum</i> and Grassland of weeds.</p> <p>Vegetation Condition: <u>Unit 1</u> Degraded <u>Unit 2</u> Good to Degraded <u>Unit 3</u> Degraded <u>Unit 4</u> Very Good to Excellent <u>Unit 5</u> not assessed</p> <p>Total Flora: 47 native taxa, 18 weed taxa Significant Flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4). Poorly reserved flora: <i>Acacia pulchella</i> var. <i>goadbyi</i>, <i>Comesperma nudiusculum</i>, <i>Drosera pulchella</i>, <i>Lepyrodia glauca</i></p>
Vegetation & Flora Survey Limitations	Bennett (2005) survey undertaken March and October 2004, included 10x10 and GPS coordinates, but specimens collected were not compared to the collections at the Western Australian Herbarium. GHD (2002) survey undertaken February 2002, assessment based on aerial interpretation and brief site visit, revee sites no GPS. DEC (2007) site visit in September and October 2007, opportunistic only.
Regional	
Vegetation Complex	Swan Complex, Southern River and Guilford Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. And 968 Medium Woodland; Jarrah, Marri and Wandoo and 1182: Medium Woodland; <i>Eucalyptus rudis</i> and <i>Melaleuca raphiophylla</i>
Floristic Community Types (FCT) *type inferred	21c, 11 and Not assessed
National/International Significance	No, but recognised as regionally significant
Fauna	
Area Specific	
Fauna Survey	Reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during July 2003 and September and October 2007.
Summary of findings	Thirty-one bird species recorded including threatened Baudin's Black Cockatoo and four species listed as conservation significant on the Swan Coastal Plain (Weebill, Yellow-rumped Thornbill, Golden Whistler, and Black-faced Woodswallow). Three native mammal species including threatened Western Ringtail Possum.

	Three amphibian species. Western Wildlife (2007) considered the area may support a Priority 3 fish species Black-striped Minnow (<i>Galaxiella nigrostriata</i>) and a Priority 5 mammal species Water Rat (<i>Hydromys chrysogaster</i>).
Fauna Survey Limitations	Site visited briefly by Western Wildlife and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 bird species (Baudin's Black Cockatoo) and one mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Rivers and Wetlands
Management Category	1 Conservation Category, 3 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B
Conclusions from survey	Consistent with information given by the DEC (2007) updating GWSCP dataset (2007).

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		YES
Regional vegetation representation		
Vegetation Complexes	Swan Complex, Southern River and Guilford Complex	
Floristic Community types	11*	
Uplands and Wetlands	Both	
Habitats	Flooded Gum Woodland	
Size and Shape		
>20ha (107ha), is a Long thin shape with large proportion of area less than 50 m wide and stretches across the entire site in an east west direction.		
Vegetation Condition		
The area is predominantly in Good to Degraded Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	Conservation Category wetland	
Other regionally significant naturally vegetated areas	Is regionally significant and remnant 7 is located just north of Ferguson river and Remnant 9 is just south of the Ferguson both of which are regionally significant	
Contains areas suitable for ecological restoration	remnant degraded	
Comment:		
Diversity		NO
Landforms	Pinjarra Plain, Bassendean Dunes	
Vegetation Complexes	3	
Floristic Community Types	2	
Vegetation units	4	
Flora	Wetland and upland diversity	
Habitats	Wetland and upland habitats	
Fauna	High fauna diversity.	

Comment:	
Rarity	YES
Vegetation Complex <10% remaining	Yes: Guildford Complex
Threatened Ecological Communities	NA
Flora	One Priority flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4) Four poorly reserved flora: <i>Acacia pulchella</i> var. <i>goadbyi</i> , <i>Comesperma nudiusculum</i> , <i>Drosera pulchella</i> , <i>Lepyrodia glauca</i>
Habitats	The five vegetation units are significant habitat for threatened species Baudin's Black Cockatoo and Western Ringtail Possum and a range of bird (including regionally significant species) and amphibian species
Fauna	Two Schedule 1 species occur (Western Ringtail Possum and Baudin's Black Cockatoo), and other threatened species may occur. Four bird species listed as conservation significant on the Swan Coastal Plain (Weebill, Yellow-rumped Thornbill, Golden Whistler, and Black-faced Woodswallow)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
Relationship/proximity to: Regional Ecological Link	Part of Ferguson River, Preston River and Mclarty/Kemerton/Twin Rivers/Preston River/Gwindinup ecological linkages
Creekline/River/Estuary	Includes the Ferguson and Preston River
Contains areas suitable for ecological restoration	yes entirety of remnant as its degraded
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	YES
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria: Representation of Ecological Communities, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 9
Location	Lot 5545 on plan 21705, Crown Reserve 40552, South Western Highway, Picton
Size (ha)	13ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry, Rural, Primary Distributor Road and Railway
Current zoning - GBRS	Rural, Primary Regional Roads, Railways and Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2003b), GHD (2002)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (Bennett 2003b, 2.1i)</u> Low Open Forest of <i>Corymbia calophylla</i> over a Low Shrubland of <i>Xanthorrhoea brunonis</i> over a Closed Sedgeland of <i>Phlebocarya ciliata</i>.</p> <p><u>Unit 2 (Bennett 2003b, 1.1)</u> Woodland of <i>Eucalyptus marginata</i> and <i>Banksia attenuata</i> over a Tall Shrubland of <i>Kunzea glabrescens</i> over Low Open Shrubland of <i>Hibbertia hypericoides</i> and an Open Sedgeland of <i>Dasypogon bromeliifolius</i> and <i>Phlebocarya ciliata</i>.</p> <p><u>Unit 3 (Bennett 2003b, 4.5i)</u> Low Woodland of <i>Melaleuca preissiana</i> over an Open Shrubland of <i>Kunzea glabrescens</i> and <i>Hakea varia</i> over an Open Low Heath of <i>Leptospermum erubescens</i> and <i>Verticordia attenuata</i> over an Open Sedgeland of <i>Lepidosperma longitudinale</i>.</p> <p><u>Unit 4 (Bennett 2003b, 4.5ii)</u> Low Woodland of <i>Melaleuca preissiana</i> over a Closed Sedgeland</p>

	<p>of <i>Baumea juncea</i>. <u>Unit 5 (Bennett 2003b, 7)</u> Emergent <i>Melaleuca preissiana</i> over Closed Heath of <i>Pericalymma ellipticum</i> and <i>Hakea varia</i> over a Sedgeland of <i>Lepidosperma longitudinale</i>. <u>Unit 6 (Bennett 2003b, 1.3)</u> Open Forest of <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i> and <i>Banksia attenuata</i> over a Tall Open Scrub of <i>Kunzea glabrescens</i> over a Sedgeland of <i>Phlebocarya ciliata</i> or <i>Tetraria octandra</i> or <i>Dasypogon bromeliifolius</i>. <u>Unit 7 (Bennett 2003b, 2.1ii)</u> Open Forest of <i>Corymbia calophylla</i> over an Open Heath of <i>Xanthorrhoea brunonis</i> over a Sedgeland of <i>Phlebocarya ciliata</i>. <u>Unit 8 (Bennett 2003b, 3.1)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i>, <i>Melaleuca preissiana</i> and <i>Banksia littoralis</i> over a Dense Sedgeland of <i>Gahnia trifida</i> or <i>Lepidosperma longitudinale</i> in damp, grey sand.</p> <p>Vegetation Condition: <u>Unit 1</u> Good to Very Good <u>Unit 2</u> Good to very Good <u>Unit 3</u> Very Good to Excellent <u>Unit 4</u> Degraded to Good <u>Unit 5</u> Excellent <u>Unit 6</u> Very Good <u>Unit 7</u> Very Good to Excellent <u>Unit 8</u> Excellent</p> <p>Total Flora: 292 native taxa, 31 weed taxa Significant Flora: Priority flora: <i>Acacia flagelliformis</i> (P4), <i>Verticordia attenuata</i> (P3), <i>Caladenia speciosa</i> (P4) Poorly reserved flora: <i>Acacia pulchella</i> var. <i>goadbyi</i>, <i>Darwinia citriodora</i>, <i>Daviesia incrassata</i>, <i>Deyeuxia quadriseta</i>, <i>Lepidosperma striatum</i>, <i>Loxocarya cinerea</i>, <i>Meeboldina scariosa</i>, <i>Patersonia umbrosa</i>, <i>Pterostylis aspera</i></p>
Vegetation & Flora Survey Limitations	(Bennett 2003b) survey undertaken 30 May 2003, indicative sites with no GPS coordinates, specimens collected were not compared to the collections at the Western Australian Herbarium. GHD (2002) survey undertaken October 2002, relevee sites no GPS.
Regional	
Vegetation Complex	Southern River
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a
National/International Significance	No, but Regionally significant

Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during July 2003.
Summary of findings	Thirteen bird species recorded including seven species listed as conservation significant on the Swan Coastal Plain (Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Western Spinebill, Western Yellow Robin, and Golden Whistler). Three native mammal species including threatened Western Ringtail Possum. One amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetland
Management Category	1 Conservation Category
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River	
Floristic Community types	21a*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, Stout Paperbark Woodland, and Marri and Peppermint Woodland	
Size and Shape		
<20ha (13ha) but is adjacent to a larger remnant that is larger than 20 ha (111 ha). It ranges from upland to wetland with corresponding communities/habitats. Contains significant habitat for fauna. Its shape is classed as Oval, rectangle or symmetrical triangle.		
Vegetation Condition		
The area is predominantly in Good to Very Good Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	Crown Reserve 40522, Loc 5545, contains a Conservation Category wetland.	
Other regionally significant naturally vegetated areas	Is regionally significant and is just south of the Ferguson river also recognised as regionally significant	
Contains areas suitable for ecological restoration	no	
Comment:		

Diversity	YES	
Landforms	Bassendean Dunes and Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	1	
Vegetation units	8.	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands.	
Fauna	Medium fauna diversity (small area, vegetation in good condition).	
Comment:		
Rarity	YES	
Vegetation Complex <10% remaining	No	
Threatened Ecological Communities	None	
Flora	3 Priority taxa; <i>Acacia flagelliformis</i> (P4), <i>Verticordia attenuata</i> (P3), <i>Caladenia speciosa</i> (P4). 9 Poorly Reserved Flora; <i>Acacia pulchella</i> var. <i>goadbyi</i> , <i>Darwinia citriodora</i> , <i>Daviesia incrassata</i> , <i>Deyeuxia quadriseta</i> , <i>Lepidosperma striatum</i> , <i>Loxocarya cinerea</i> , <i>Meeboldina scariosa</i> , <i>Patersonia umbrosa</i> , <i>Pterostylis aspera</i>	
Habitats	The eight vegetation units are good habitats (see Vegetation and Flora, above) for conservation significant bird species on the Swan Coastal Plain and threatened Western Ringtail Possum	
Fauna	One Schedule 1 species, Western Ringtail Possum recorded and other threatened species may occur. At least seven regionally significant bird species (Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Western Spinebill, Western Yellow Robin, and Golden Whistler)	
Comment:		
Maintaining Ecological Processes and Natural Systems		YES
Relationship/proximity to: Regional Ecological Link	Part of McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage and adjacent to Ferguson River ecological linkage.	
Creekline/River/Estuary	Ferguson River to the north	
Contains areas suitable for ecological restoration	no	
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities		
Comment:		
Scientific or Evolutionary Importance		NO
Comment:		
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation		
YES		
Comment: Has Conservation Category wetland within a recognised regionally significant bushland		

SUMMARY NATURAL VALUES***Regional Significance - Assessment area against the Criteria***

The area meets 4 criteria: Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 10
Location	Lot 5, on plan 7878, Boyanup-Picton Road Picton East and Lot 520 on plan 301384, Picton East
Size (ha)	111 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S48A CRN220954.

Planning Considerations	
General	
Current zoning – Local	General Farming, General Industry and Public Utilities
Current zoning - GBRS	Rural, Industrial, Railways and Primary Regional Roads

Environmental Considerations - Natural Attributes	
Landforms	
<i>Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2003a), GHD (2002), DEC (2007)
Summary of findings	<p>Southern River and Guildford Complex Vegetation</p> <p><u>Unit 1 (Bennett 2003a, 1.1)</u> Woodland of <i>Eucalyptus marginata</i> and <i>Banksia attenuata</i> over a Tall Shrubland of <i>Kunzea glabrescens</i> over Low Open Shrubland of <i>Hibbertia hypericoides</i> and an Open Sedgeland of <i>Dasypogon bromeliifolius</i> and <i>Phlebocarya ciliata</i></p> <p><u>Unit 2 (Bennett 2003a, 3.2)</u> Low Open Forest of <i>Melaleuca raphiophylla</i>, <i>M. preissiana</i> and <i>M. viminea</i> over a Closed Grassland / Sedgeland of <i>Lepidosperma longitudinale</i> and <i>Gahnia trifida</i></p> <p><u>Unit 3 (Bennett 2003a, 3.3)</u> Open, disturbed wetland dominated by introduced species with scattered <i>Melaleuca lateritia</i>, surrounded by remnant of Low Open Woodland to Low Woodland of <i>Melaleuca raphiophylla</i> and <i>M. preissiana</i></p> <p><u>Unit 4 (Bennett 2003a, 2.2)</u> Open Forest of <i>Corymbia calophylla</i> over a Low Open Woodland</p>

	<p>of <i>Agonis flexuosa</i> over a Closed Grassland / Herbland of grass species and / or <i>Pteridium esculentum</i> <u>Unit 5 (Bennett 2003a, 4.3)</u> Low Woodland of <i>Melaleuca preissiana</i> over an Open Shrubland to Shrubland of <i>Astartea aff. fascicularis</i> over a Sedgeland of <i>Juncus pallidus</i> and / or <i>Lepidosperma longitudinale</i> <u>Unit 6 (Bennett 2003a, 5.3)</u> Emergent <i>Melaleuca preissiana</i> over Closed Tall Scrub of <i>Kunzea glabrescens</i> over a Tall Shrubland of <i>Astartea aff. fascicularis</i> over an Open Sedgeland of <i>Lepidosperma longitudinale</i> <u>Unit 7 (Bennett 2003a, 5.1)</u> Emergent <i>Melaleuca preissiana</i> over Closed Tall Scrub of <i>Kunzea glabrescens</i> over Low to Tall Shrubland of <i>Verticordia attenuata</i> and <i>Astartea aff. fascicularis</i> over an Open Sedgeland of <i>Lepidosperma longitudinale</i> <u>Unit 8 (Bennett 2003a, 4.1)</u> Low Woodland of <i>Melaleuca preissiana</i> over a Closed Heath of <i>Astartea aff. fascicularis</i> over an Open Sedgeland of <i>Lepidosperma longitudinale</i> or bare ground <u>Unit 9 (Bennett 2003a, 4.2)</u> Low Open Forest of <i>Melaleuca preissiana</i> and <i>Agonis flexuosa</i> over an Open Heath of <i>Astartea aff. fascicularis</i> over a Low Shrubland of <i>Xanthorrhoea brunonis</i> and an Open Sedgeland of <i>Lepidosperma longitudinale</i> or bare ground <u>Unit 10 (GHD 2002, Area 9)</u> Scattered <i>Melaleuca raphiophylla</i> and <i>M. preissiana</i> with <i>Agonis flexuosa</i>, <i>Astartea fascicularis</i> and <i>Cotula coronopifolia</i> fringed by Woodland of <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i> over scattered <i>Xanthorrhoea preissii</i> and Herbs</p> <p>Vegetation Condition: <u>Unit 1:</u> Very Good to Excellent and Degraded to Completely Degraded <u>Unit 2:</u> Good to Completely Degraded <u>Unit 3:</u> Degraded to Completely Degraded <u>Unit 4:</u> Very Good to Completely Degraded <u>Unit 5:</u> Degraded <u>Unit 6:</u> Good to Very Good <u>Unit 7:</u> Very Good to Excellent <u>Unit 8:</u> Very Good to Excellent <u>Unit 9:</u> Very Good</p> <p>Total Flora: 338 native taxa, 35 weed taxa Significant Flora: <i>Acacia flagelliformis</i> (P4) 9 poorly reserved flora: <i>Anarthria prolifera</i>, <i>Darwinia citriodora</i>, <i>Juncus subsecundus</i>, <i>Lepidosperma striatum</i>, <i>Loxocarya cinerea</i>, <i>Meeboldina scariosa</i>, <i>Pterostylis aspera</i>, <i>Scaevola pilosa</i>, <i>Siloxerus filifolius</i></p>
Vegetation & Flora Survey Limitations	Bennett (2003a) survey undertaken 16 and 17 June 2003, relevee sites no GPS, some specimens too small for positive

	identification. GHD (2002) survey undertaken 27 February 2002, assessment based on aerial interpretation and brief site visit, relevee sites no GPS. DEC (2007) survey undertaken 27 September 2007, relevee sites no plots.
Regional	
Vegetation Complex	Southern River and Guildford Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. and 968 Medium Woodland; Jarrah, Marri and Wandoo
Floristic Community Types (FCT) *type inferred	21a* & 4*
National/International Significance	NA
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during July 2003, September and October 2007 and February 2008.
Summary of findings	Thirty bird species recorded including two threatened species (Red-tailed Black Cockatoo and Carnaby's Black Cockatoo) and 11 species listed as conservation significant on the Swan Coastal Plain (Brown Goshawk, Wedge-tailed Eagle, Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Western Spinebill, Scarlet Robin, Golden Whistler, and Grey Shrike-Thrush). Two native mammal species including threatened Western Ringtail Possum. Five reptile species and three amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Two Schedule 1 bird species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Conservation Category, 1 Resource Enhancement, 2 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	NO
<i>Regional vegetation representation</i>	

Vegetation Complexes	Southern River and Guildford
Floristic Community types	21a* & 11*
Uplands and Wetlands	Both
Habitats	Jarrah and Banksia Woodlands, Stout Paperbark Woodland, Marri and Peppermint Woodland and Fresh and Stout Paperbark
<i>Size and Shape</i> >20ha (111ha) in consolidated shape surrounded by other areas of remnant vegetation.	
<i>Vegetation Condition</i> The area is predominantly in Good condition	
<i>Relationship/proximity to:</i> Naturally vegetated areas The area is naturally vegetated Protected areas None Other regionally significant naturally vegetated areas Adjacent to north Investigation area 9 is regionally significant. Adjacent to south Investigation area 11 is regionally significant. Adjacent to west Investigation area 14 is regionally significant.	
<i>Contains areas suitable for ecological restoration</i>	no
Comment: includes small area of Guildford complex in Degraded condition that is not best example of its type	
Diversity	YES
Landforms	Bassendean, Pinjarra Plain
Vegetation Complexes	2
Floristic Community Types	2
Vegetation units	9
Flora	Very high flora diversity (large area with wetland and upland diversity)
Habitats	High habitat diversity in both uplands and wetlands with ten different habitats
Fauna	Medium to high fauna diversity (relatively large area, high habitat diversity and vegetation in very good condition)
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	Yes: Guildford Complex
Threatened Ecological Communities	None
Flora	1 Priority flora <i>Acacia flagelliformis</i> (P4) 9 poorly reserved flora: <i>Anarthria prolifera</i> , <i>Darwinia citriodora</i> , <i>Juncus subsecundus</i> , <i>Lepidosperma striatum</i> , <i>Loxocarya cinerea</i> , <i>Meeboldina scariosa</i> , <i>Pterostylis aspera</i> , <i>Scaevola pilosa</i> , <i>Siloxerus filifolius</i>
Habitats	The ten vegetation units provide significant diverse habitats for Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Western Ringtail Possum, and at least 11 conservation significant Swan Coastal Plain bird species.
Fauna	Three Schedule 1 species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo and Western Ringtail Possum) and 11 species listed as conservation significant on the Swan Coastal Plain

	(Brown Goshawk, Wedge-tailed Eagle, Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Western Spinebill, Scarlet Robin, Golden Whistler, and Grey Shrike-thrush).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage).
Creekline/River/Estuary	Ferguson River to the north.
<i>Contains areas suitable for ecological restoration</i>	Some areas degraded by grazing.
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria, being: Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation 11
Location	Lots 1, 2 and 3 on diagram 46933, Moore Road Dardanup West
Size (ha)	75 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	<i>Environmental Protection (Swan Coastal Lakes) Policy 1992</i> (EPP Lake)
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming, General Industry and Important Regional Roads
Current zoning - GBRS	Rural, Industrial and Primary Regional Roads

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2003a), Bennett (2005), GHD (2002) and DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (Bennett 2005, PC15i)</u> Woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> over Woodland of <i>Banksia attenuata</i>, <i>B. ilicifolia</i> and <i>Xylomelum occidentale</i> over mixed Shrubland over Sedgeland.</p> <p><u>Unit 2 (Bennett 2005, PC13i)</u> Low Open Woodland of <i>Melaleuca preissiana</i> over a Tall Open Scrub of <i>Melaleuca teretifolia</i> over a Sedgeland dominated by <i>Lepidosperma longitudinale</i>.</p> <p><u>Unit 3 (Bennet 2003b, 5.2)</u> Emergent <i>Melaleuca preissiana</i> and <i>Corymbia calophylla</i> over Tall Open Shrubland of <i>Kunzea glabrescens</i> with Open Heath of <i>Astartea</i> aff. <i>fascicularis</i> over Closed Grassland of introduced species.</p> <p><u>Unit 4 (Bennett 2003b, 4.4)</u> Low Open Woodland of <i>Melaleuca preissiana</i> over Closed Tall Scrub of <i>Astartea</i> aff. <i>fascicularis</i> over bare ground.</p>

	<p><u>Unit 5 (GHD 2002, Area 8)</u> Scattered <i>Melaleuca preissiana</i> and <i>Juncus pallidus</i> over grasses fringed by Woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over scattered <i>Kunzea glabrescens</i> over <i>Pericalymma ellipticum</i>.</p> <p><u>Unit 6 (DEC 2007, 11.7)</u> Open Woodland of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over Low Open Woodland of <i>Banksia attenuata</i> and <i>B. illicifolia</i> over Mixes Open Heath of Mixed Low Shrubland and Very Open Sedgeland.</p> <p><u>Unit 7 (DEC 2007, 13.8)</u> Low Open Woodland of <i>Melaleuca preissiana</i> over Tall Shrubland of <i>Melaleuca lateritia</i> over Mixed Sedgeland and standing water.</p> <p>Vegetation Condition: <u>Unit 1</u> Very Good to Excellent <u>Unit 2</u> Very Good to Excellent <u>Unit 3</u> Degraded to Completely Degraded <u>Unit 4</u> Degraded to Completely Degraded <u>Unit 5</u> Degraded <u>Unit 6</u> Excellent <u>Unit 7</u> Good to Very Good</p> <p>Total Flora: 102 native taxa, 33 weed taxa Significant Flora: <i>Caladenia ?speciosa</i> (P4) Poorly reserved flora: <i>Boronia dichotoma</i>, <i>Comesperma nudiusculum</i>, <i>Deyeuxia quadriseta</i>, <i>Lepidosperma striatum</i>, <i>Patersonia umbrosa</i>,</p>
Vegetation & Flora Survey Limitations	<p>Bennett (2003a) survey undertaken 16 and 17 June 2003, relevee sites no GPS, some specimens found to be too small for positive identification. Bennett (2005) survey undertaken 24 to 27 March 2004 and 20 to 23 October 2004, both 10x10 and GPS coordinates and relevee sites with no GPS coordinates, specimens collected was not compared to the collections at the Western Australian Herbarium. GHD (2002) survey undertaken 27 February 2002, assessment based on aerial interpretation and brief site visit, relevee sites no GPS. DEC (2007) survey undertaken 27 September 2007, relevee sites no plots.</p>
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a, 11 and Not assessed
National/International Significance	None
Fauna	
Area Specific	

Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Thirty-one bird species recorded including three threatened species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Carnaby's Black Cockatoo) and nine species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, Western Yellow Robin, Golden Whistler, and Grey Shrike-Thrush). Three native mammal species including threatened Western Ringtail Possum. One amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Three Schedule 1 bird species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo, Carnaby's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Resource Enhancement, 5 Multiple Use, 1 EPP lake
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	21c* & 11*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, and Flooded Gum Woodland	
Size and Shape		
>20ha (75ha), is Irregular in shape with few indentations. It is adjacent to remnant bushland in all directions.		
Vegetation Condition		
The area is predominantly in Very Good to Excellent Condition		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	EPP Lake	
Other regionally significant naturally vegetated areas	Adjacent to north Investigation area 10 is regionally significant. Adjacent to east Investigation area 12 is regionally significant.	
Contains areas suitable for ecological restoration	no	

Comment:	
Diversity YES	
Landforms	Bassendean Dunes and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	5
Flora	Wetland and upland diversity
Habitats	High habitat diversity in both uplands and wetlands with seven different habitats
Fauna	Medium fauna diversity (relatively large area, vegetation in good condition)
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 Priority flora: <i>Caladenia ?speciosa</i> (P4) 5 poorly reserved flora: <i>Boronia dichotoma</i> , <i>Comesperma nudiusculum</i> , <i>Deyeuxia quadriseta</i> , <i>Lepidosperma striatum</i> , <i>Patersonia umbrosa</i>
Habitats	The seven vegetation units provide significant diverse habitats for Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Western Ringtail Possum, and at least nine conservation significant Swan Coastal Plain bird species.
Fauna	Four Schedule 1 species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Western Ringtail Possum). Nine conservation significant Swan Coastal Plain bird species (Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, Western Yellow Robin, Golden Whistler, and Grey Shrike-thrush).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	none
<i>Contains areas suitable for ecological restoration</i>	
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	

Comment: Has EPP lake within a recognised regionally significant bushland

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 4 criteria, being: Diversity, Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 12
Location	Lots 4 on diagram 46933 Dardanup West, Lot 10 on diagram 82158, Busher Road, Dardanup West and Lot 609 on plan 246174, Resta Rd Dardanup West
Size (ha)	31 ha (native remnant vegetation)
Reason for assessment	Structure Plan for Preston Industrial Park

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming and General Industry
Current zoning - GBRS	Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Bassendean Dunes over Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (Bennett 2005, PC15)</u> Woodland of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> over Woodland of <i>Banksia attenuata</i>, <i>B. ilicifolia</i> and <i>Xylomelum occidentale</i> over mixed Shrubland over Sedgeland</p> <p><u>Unit 2 (Bennett 2005, PC18)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i> over a Closed Sedgeland of mixed species</p> <p><u>Unit 3 (Bennett 2005, PC17)</u> Closed Forest of <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> over a Sedgeland of <i>Lepidosperma longitudinale</i> and <i>Baumea juncea</i> or Herbland of <i>Pteridium esculentum</i></p> <p>Vegetation Condition: <u>Unit 1</u> Very Good to Excellent</p>

	<p>Unit 2 Excellent</p> <p>Unit 3 Excellent</p> <p>Total Flora: 93 native taxa, 22 weed taxa</p> <p>Significant Flora: No DRF or Priority flora.</p> <p>1 Poorly Reserved Flora: <i>Meeboldina scariosa</i></p>
Vegetation & Flora Survey Limitations	Bennett (2005) survey undertaken 24 to 27 March 2004 and 20 to 23 October 2004, included 10x10 and GPS coordinates, but specimens collected was not compared to the collections at the Western Australian Herbarium. DEC (2007) survey was roadside assessment only due to access constraints.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. And 968: Medium Woodland; jarrah, marri and wandoo
Floristic Community Types (FCT) *type inferred	21a* & 11*
National/International Significance	None
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Six bird species recorded including three threatened species (Red-tailed Black Cockatoo, Baudin's Black Cockatoo and Carnaby's Black Cockatoo) and three species listed as conservation significant on the Swan Coastal Plain (Purple Swamphen, Common Bronzewing, and Yellow-rumped Thornbill). Two amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Three Schedule 1 bird species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Resource Enhancement, 2 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	NO

<i>Regional vegetation representation</i>	
Vegetation Complexes	Southern River Complex
Floristic Community types	21c* & 11*
Uplands and Wetlands	Both
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, and Marri and Peppermint Woodland
<i>Size and Shape</i> >20ha (42ha), elongated shape, with two adjacent remnants north and west of remnant 12.	
<i>Vegetation Condition</i> The area is predominantly in Excellent Condition	
<i>Relationship/proximity to:</i>	
Naturally vegetated areas	The area is naturally vegetated
Protected areas	None
Other regionally significant naturally vegetated areas	Adjacent to northwest Investigation area 10 is regionally significant. Adjacent to west Investigation area 11 is regionally significant.
<i>Contains areas suitable for ecological restoration</i>	no
Comment:	
Diversity YES	
Landforms	Bassendean and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	3
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Medium to low fauna diversity.
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 Poorly Reserved Flora: <i>Meeboldina scariosa</i>
Habitats	The three vegetation units are significant habitat for threatened Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo and at least three conservation significant Swan Coastal Plain bird species
Fauna	Three Schedule 1 species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo). Three species listed as conservation significant on the Swan Coastal Plain (Purple Swamphen, Common Bronzewing, and Yellow-rumped Thornbill).
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i>	
Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological

Creekline/River/Estuary	linkage) None
<i>Contains areas suitable for ecological restoration</i>	no
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation NO	
Comment:	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 3 criteria, being: Diversity, Rarity, and Maintaining Ecological Processes and Natural Systems.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 13
Location	Lot 1 on diagram 46933 Dardanup West
Size (ha)	9 ha (native remnant vegetation)

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	None
Summary of findings	<p>Southern River Complex</p> <p>Vegetation:</p> <p><u>Unit 1 (DEC 2007, 13.1)</u> Woodland of <i>Eucalyptus marginata</i> over Low Woodland of <i>Banksia attenuata</i> and <i>B. illicifolia</i> over Tall Shrubland of <i>Kunzea glabrescens</i> over Open Shrubland of <i>Xanthorrhoea brunonis</i>.</p> <p><u>Unit 2 (DEC 2007, 13.2)</u> Low Woodland of <i>Melaleuca preissiana</i> with Emergent <i>Corymbia calophylla</i> over Open Heath of <i>Astartea fascicularis</i> over Mixed Open Sedgeland.</p> <p>Vegetation Condition:</p> <p><u>Unit 1</u> Good <u>Unit 2</u> Good</p> <p>Total Flora: not assessed</p> <p>Significant Flora: Not assessed</p>
Vegetation & Flora Survey Limitations	Inspected by Ecoscape (2006) and DEC (2007) but no reference sites established

Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	NA
National/International Significance	No Vegetation and Flora Survey was undertaken for this area
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Eleven bird species recorded including three species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Splendid Fairy-wren, and Inland Thornbill).
Fauna Survey Limitations	Site not visited by Western Wildlife due to restricted access and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Site inadequately surveyed but threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Multiple Use, 1 Not Assessed
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	NA	
Uplands and Wetlands	Both	
Habitats	Jarrah and Banksia Woodlands	
Size and Shape		
<20ha (9ha), Circle, square or squat rectangle. There are four larger remnants to the north, east and south.		
Vegetation Condition		
The area is predominantly Degraded		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated	
Protected areas	None	
Other regionally significant naturally vegetated areas	None	
Contains areas suitable for ecological restoration	no	

Comment:	
Diversity	NO
Landforms	Bassendean Dunes and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	NA
Vegetation units	NA
Flora	Uplands only.
Habitats	Uplands only.
Fauna	Medium to low fauna diversity (small area).
Comment:	
Rarity	NOT KNOWN
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	NA
Habitats	Jarrah and Banksia Woodland and Melaleuca Woodland provides good habitat for conservation significant bird species
Fauna	At least three conservation significant bird species on the Swan Coastal Plain recorded. Threatened species likely to occur.
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
Relationship/proximity to: Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage).
Creekline/River/Estuary	Preston River to the west
Contains areas suitable for ecological restoration	yes parts of remnant previously grazed
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	NO
Comment:	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 1 criterion, being: Maintaining Ecological Processes and Natural Systems. It may also meet the Rarity criterion.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 14
Location	Lot 5, on plan 7878, Boyanup-Picton Road Picton East
Size (ha)	24 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S38 EPA Bulletin 1129 (2004), S48A CRN220954, S38 CRN221096.

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007), DEC (2007b)
Summary of findings	<p>Southern River Complex Vegetation:</p> <p><u>Unit 1 (DEC 2007, 14.1)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i> over Open Herbland of <i>Cotula coronopifolia</i> and Grassland over Open Water.</p> <p><u>Unit 2 (DEC 2007, 14.2)</u> Low Open Forest of <i>Melaleuca raphiophylla</i> with Emergent <i>Eucalyptus rudis</i> over Open Shrubland of <i>Melaleuca teretifolia</i> over Open Sedgeland and Open Herbland over Open Water.</p> <p><u>Unit 3 (DEC 2007, 14.3)</u> Woodland of <i>Corymbia calophylla</i> over Low Woodland of <i>Agonis flexuosa</i>.</p> <p><u>Unit 4 (DEC 2007b, RFRF)</u> Wetland Mosaic of <i>Melaleuca raphiophylla</i>, <i>Eucalyptus rudis</i>, <i>M. incana</i> and <i>M. teretifolia</i> over <i>Gahnia trifida</i>, <i>Meeboldina cana</i>, <i>Ornithopsis compressus</i> and <i>Sherardia arvensis</i>.</p>

	Vegetation Condition: <u>Unit 1</u> Very Good <u>Unit 2</u> Very Good <u>Unit 3</u> Degraded <u>Unit 4</u> Not assessed Total Flora: Not assessed Significant Flora: One DRF <i>Diuris drummondii</i> . DEC South West Region surveys identified this location as largest known population within the Greater Bunbury Region and the second largest in WA.
Vegetation & Flora Survey Limitations	DEC (2007) survey undertaken 27 September 2007, revelee sites no plots. Inspected by Ecoscape (2007) but no reference sites established.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	Not assessed
National/International Significance	<i>Diuris drummondii</i> is listed as Vulnerable under <i>EPBC Act 1999</i> .
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Nine bird species recorded including five species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, and Golden Whistler). Two native mammal species including threatened Western Ringtail Possum. Three amphibian species.
Fauna Survey Limitations	Site not visited by Western Wildlife due to restricted access and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	3 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	NO
<i>Regional vegetation representation</i>	
Vegetation Complexes	Southern River Complex

Floristic Community types	NA
Uplands and Wetlands	Both
Habitats	Jarrah and Banksia Woodlands, Freshwater Paperbark Woodland, Stout Paperbark Woodland, and Flooded Gum Woodland
<i>Size and Shape</i> <20ha (9ha), Irregular shape with many indentations. There are four other recognised remnants to the north, east and south.	
<i>Vegetation Condition</i> Very Good condition with patches of localised disturbance. Signs of recruitment and recovery since grazing ceased in 2006, of particular note the number of individual plants of <i>Diuris drummondii</i> (DRF) rose from 41 in 2006 to 1043 in 2007.	
<i>Relationship/proximity to:</i> Naturally vegetated areas Protected areas Other regionally significant naturally vegetated areas	Few None Adjacent to east Investigation area 10 is regionally significant.
<i>Contains areas suitable for ecological restoration</i>	yes – entire remnant degraded
Comment:	
Diversity	NO
Landforms	Bassendean Dunes and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	NA
Vegetation units	NA
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Medium fauna diversity
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 DRF <i>Diuris drummondii</i>
Habitats	The four vegetation units provide habitat for threatened Western Ringtail Possum and several regionally significant bird species
Fauna	One threatened mammal species (Western Ringtail Possum) and five bird species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Splendid Fairy-wren, White-browed Scrubwren, Inland Thornbill, and Golden Whistler)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i> Regional Ecological Link Creekline/River/Estuary	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage) Preston River to the west
<i>Contains areas suitable</i>	yes – remnant degraded

<i>for ecological restoration</i>	
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	
NO	
Comment:	

<i>SUMMARY NATURAL VALUES</i>	
<i>Regional Significance - Assessment area against the Criteria</i>	
The area meets 2 criteria, being: Rarity and Maintaining Ecological Processes and Natural Systems.	

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 15
Location	Lot 3 South Western Hwy
Size (ha)	21 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry and Parks and Recreation
Current zoning - GBRS	Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex</p> <p>Vegetation:</p> <p><u>Unit 1 (DEC 2007, 15.1)</u> Open Forest of <i>Banksia attenuata</i>, <i>Eucalyptus marginata</i> and <i>B. illicifolia</i> over Shrubland of <i>Melaleuca thymoides</i>, <i>Davesia decurrens</i> and <i>Hibbertia hypericoides</i> over Very Open Herbland and Very Open Sedgeland.</p> <p><u>Unit 2 (DEC 2007, 15.2)</u> Low Closed Forest of <i>Banksia attenuata</i>, <i>Agonis flexuosa</i> and <i>Eucalyptus marginata</i> over Shrubland of <i>Kunzea glabrescens</i> over Low Open Shrubland of <i>Xanthorrhoea brunonis</i> and <i>Dasypogon bromeliifolius</i> over Grassland of introduced species.</p> <p><u>Unit 3 (DEC 2007, 15.3)</u> Low Woodland of <i>Melaleuca preissiana</i> and <i>Banksia littoralis</i> over Tall Shrubland of <i>Astartea affinis</i>, <i>Taxandria linearifolia</i> and <i>Kunzea glabrescens</i> over Open Shrubland of <i>Hypocalymma angustifolium</i> over Sedgeland over Very Open Herbland.</p> <p><u>Unit 4 (DEC 2007, 15.4)</u> Wetland Mosaic</p>

	<p><u>Unit 5 (DEC 2007, 15.5)</u> Open Forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over Low Woodland of <i>Banksia attenuata</i> and <i>B. illicifolia</i>.</p> <p>Vegetation Condition: <u>Unit 1</u> Good to Degraded <u>Unit 2</u> Good to Degraded <u>Unit 3</u> Excellent <u>Unit 4</u> Excellent <u>Unit 5</u> Very Good Note that in two locations within Unit 1 and Unit 2, vegetation condition appeared to be severely impacted, DEC investigations underway. Total Flora: Not assessed Significant Flora: Not assessed</p>
Vegetation & Flora Survey Limitations	DEC (2007) survey undertaken 28 September 2007, relevee sites no plots. Ecoscape (2006) inspected but no reference sites established.
<i>Regional</i>	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp. And 1182: Medium Woodland; Eucalyptus rudis and Melaleuca raphiophylla
Floristic Community Types (FCT) *type inferred	NA
National/International Significance	None
<i>Fauna</i>	
<i>Area Specific</i>	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Nineteen bird species recorded including three species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing, Fan-tailed Cuckoo, and White-browed Scrubwren). One native mammal species including threatened Western Ringtail Possum. Five amphibian species. Western Wildlife (2006) considered the site may support a Priority 3 species Black-striped Minnow (<i>Galaxiella nigrostriata</i>) and a Priority 5 species Water Rat (<i>Hydromys chrysogaster</i>). Site likely to provide foraging habitat for Endangered cockatoos. Areas of dense understorey vegetation provides habitat for habitat-specialist sedentary birds.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short

	site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	2 Multiple Use, 1 is likely Conservation category
Suite	N/A See Semeniuk 1998 Vol 2B
Conclusions from survey	Recommendation to assess the category of wetland UFI-1336, likely upgraded to CCW.

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	NA	
Uplands and Wetlands	Both	
Habitats	Jarrah & Banksia, Freshwater Paperbark, & Stout Paperbark Woodlands	
Size and Shape		
>20ha (21ha), Irregular shape with few indentations. Two other nearby remnants.		
Vegetation Condition		
The area is predominantly Good to Excellent with patches of severe disturbance.		
Relationship/proximity to:		
Naturally vegetated areas	Few	
Protected areas	None	
Other regionally significant naturally vegetated areas	Remnant 8 recognised as regionally significant is to the north	
Contains areas suitable for ecological restoration	no	
Comment:		
Diversity		NO
Landforms	Bassendean Dunes and Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	Not assessed	
Vegetation units	>5	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands.	
Fauna	Medium fauna diversity (relatively small area, vegetation in good condition).	
Comment:		
Rarity		YES
Vegetation Complex <10% remaining	None	
Threatened Ecological	Not assessed	

Communities	
Flora	Not assessed
Habitats	The five vegetation units provide a range of habitats (see Vegetation and Flora, above) for diverse assemblage of bird (including conservation significant species) and amphibian species.
Fauna	One Schedule 1 species: Western Ringtail Possum. Other Threatened species likely to occur. At least three regionally significant bird species (Common Bronzewing, Fan-tailed Cuckoo, and White-browed Scrubwren)
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link Creekline/River/Estuary	Part of east-west linkage – Maidens/Preston River Preston River to the north
<i>Contains areas suitable for ecological restoration</i>	no
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance NO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation YES	
Comment: Has a likely Conservation Category wetland within a recognised regionally significant bushland.	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 3 criteria: Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 16
Location	Lots 1050 on plan 33291, Crown Reserve 670 South Western Highway Davenport, Lot 549 on plan 213069 South Western Highway, Lot 5 on diagram 50137 South West Highway Davenport and Lots 14 and 15 on plan 64665 South West Highway Davenport
Size (ha)	28 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry, Special Use 17 and 18, Parks and Recreation, Rural Public Purposes, Primary Distributor Road and Development Zone-Industrial
Current zoning - GBRS	Regional Open Space, Public Purpose, Rural, Primary Regional Roads and Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005), HGM (2002), DEC (2007)
Summary of findings	Southern River Complex Vegetation <u>Unit 1 (HGM 2002, 4.6)</u> Tall Shrubland of <i>Kunzea glabrescens</i> over a Sedgeland of <i>Phlebocarya ciliata</i> and <i>Dasypogon bromeliifolius</i> . <u>Unit 2 (HGM 2002, 4.5)</u> Low Closed Forest of <i>Melaleuca raphiophylla</i> over Grassland of weeds. <u>Unit 3 (HGM 2002, 4.4)</u> Low Open Forest of <i>Melaleuca preissiana</i> and <i>Agonis flexuosa</i> subsp. <i>flexuosa</i> over a Closed Grassland of weeds. <u>Unit 4 (Bennett 2005, PC13)</u>

	<p>Low Open Woodland of <i>Melaleuca preissiana</i> over a Tall Open Scrub of <i>Melaleuca teretifolia</i> over a Sedgeland dominated by <i>Lepidosperma longitudinale</i>. <u>Unit 5 (DEC 2007, 16.1)</u> Low Open Woodland of <i>Melaleuca preissiana</i> and <i>Nuytsia floribunda</i> over Open Shrubland of <i>Pericalymma ellipticum</i> over Open Sedgeland of <i>Lepidosperma longitudinale</i> and Mixed Herbland. <u>Unit 6 (DEC 2007, 16.2)</u> Open Woodland of <i>Corymbia calophylla</i> over Low shrubland of <i>Phlebocaryna ciliata</i> and <i>Dasypogon bromeliifolius</i>. Vegetation Condition: <u>Unit 1</u> Good to Degraded <u>Unit 2</u> Good to Degraded <u>Unit 3</u> Good to Degraded <u>Unit 4</u> Excellent <u>Unit 5</u> Very Good Total Flora: native 119, weeds 22 Significant Flora: No DRF or Priority flora. 5 Poorly Reserved Flora: <i>Acacia pulchella</i> var. <i>goadbyi</i>, <i>Anarthria prolifera</i>, <i>Comesperma nudiusculum</i>, <i>Meeboldina scariosa</i>, <i>Siloxerus filifolius</i></p>
Vegetation & Flora Survey Limitations	HGM (2002) survey undertaken in September 2002, included 10x10m quadrats with GPS coordinates. Bennett (2005) survey undertaken in March and October 2004, included 10x10 and GPS coordinates and relevee sites with no GPS coordinates, specimens collected were not compared to the collections at the Western Australian Herbarium, DEC (2007) survey undertaken 10 October 2007, relevees only.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; <i>Melaleuca</i> spp.
Floristic Community Types (FCT) *type inferred	21a* & 11*
National/International Significance	No
Fauna	
Area Specific	
Fauna Survey	<p>Level 1 survey carried out by HGM (2002). Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.</p>
Summary of findings	Twenty-seven bird species recorded including one threatened species (Baudin's Black Cockatoo) and seven species listed as

	conservation significant on the Swan Coastal Plain (Wedge-tailed Eagle, Little Eagle, Splendid Fairy-wren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, and Grey Shrike-Thrush). One native mammal species. One reptile species and two amphibian species.
Fauna Survey Limitations	Site was only surveyed briefly by HGM and visited briefly by Western Wildlife and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 bird species (Baudin's Black Cockatoo). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	2 Conservation Category, 1 Resource Enhancement and 3 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	NA	
Uplands and Wetlands	Both	
Habitats	Marri, Peppermint, Freshwater Paperbark, Stout Paperbark, and Flooded Gum Woodlands over shrublands and sedglands	
Size and Shape >20ha (28ha), Long thin shape with large proportion of area less than 50 m wide. Two remnants nearby to the north and south-east.		
Vegetation Condition The area is predominantly Good		
Relationship/proximity to:		
Naturally vegetated areas	Few	
Protected areas	None	
Other regionally significant naturally vegetated areas	Adjoins remnant 17 which is recognised as regionally significant	
Contains areas suitable for ecological restoration	yes portions are degraded	
Comment:		
Diversity		NO
Landforms	Bassendean Dunes and Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	2	
Vegetation units	4	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands habitats with six vegetation units	

Fauna	Medium to high fauna diversity recorded
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	5 poorly reserved flora: <i>Acacia pulchella</i> var. <i>goadbyi</i> , <i>Anarthria prolifera</i> , <i>Comesperma nudiusculum</i> , <i>Meeboldina scariosa</i> , <i>Siloxerus filifolius</i>
Habitats	The six vegetation units in upland and wetland habitats important for threatened and regionally significant species
Fauna	One Schedule 1 species recorded (Baudin's Black Cockatoo) and other threatened species likely to occur. Seven species listed as conservation significant on the Swan Coastal Plain (Wedge-tailed Eagle, Little Eagle, Splendid Fairy-wren, Inland Thornbill, Yellow-rumped Thornbill, Scarlet Robin, and Grey Shrike-thrush)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
Relationship/proximity to: Regional Ecological Link Creekline/River/Estuary	Part of east-west linkage – Maidens/Preston River None
Contains areas suitable for ecological restoration	yes small areas degraded
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	YES
Comment: Has Conservation Category wetland within recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 3 criteria, being: Rarity, Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 17
Location	Lot 15 on plan 64665 South Western Highway Davenport
Size (ha)	18 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S38 CRN114804.

Planning Considerations	
General	
Current zoning – Local	Primary Distributor Road and Development Zone-Industrial
Current zoning - GBRS	Primary Regional Roads and Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dune and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	Bennett (2005), GHD (2002), DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 Bennett (2005, PC12)</u> Scattered <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Corymbia calophylla</i> with Woodland of <i>Agonis flexuosa</i> subsp. <i>flexuosa</i>, <i>Banksia attenuata</i>, <i>B. ilicifolia</i> and <i>Kunzea glabrescens</i> over a Sedgeland or bare ground</p> <p><u>Unit 2 (GHD 2002, Area 5)</u> Woodland of <i>Eucalyptus marginata</i> and <i>Agonis flexuosa</i> with scattered <i>Corymbia calophylla</i> over scattered <i>Kunzea glabrescens</i> over Grassland of weeds</p> <p><u>Unit 3 (DEC 2007, 17.1)</u> Low Open Woodland of <i>Melaleuca preissiana</i>.</p> <p>Vegetation Condition: <u>Unit 1</u> Degraded <u>Unit 2</u> Good to Degraded <u>Unit 3</u> Degraded</p> <p>Total Flora: native 35 weeds 3 Significant Flora: none</p>

	1 Poorly Reserved Flora: <i>Lepidosperma striatum</i>
Vegetation & Flora Survey Limitations	Bennett (2005) survey undertaken in March and October 2004, included both 10x10 and relevee sites with no GPS coordinates, specimens collected were not compared to the collections at the Western Australian Herbarium. GHD (2002) survey undertaken 27 February 2002, based on aerial interpretation and brief site visit, relevee sites no GPS. DEC (2007) survey undertaken 10 October 2007, relevee sites no plots.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; Jarrah-Marri/Low woodland; Banksia/Low forest; Melaleuca spp. and 1182: Medium Woodland; <i>Eucalyptus rudis</i> and <i>Melaleuca raphiophylla</i>
Floristic Community Types (FCT) *type inferred	21a*
National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September and October 2007.
Summary of findings	Fifteen bird species recorded including one threatened species (Baudin's Black Cockatoo) and two species listed as conservation significant on the Swan Coastal Plain (Inland Thornbill and Yellow-rumped Thornbill). Three native mammal species including threatened Western Ringtail Possum. One amphibian species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visits were opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 bird species (Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Conservation Category, 2 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria	Criterion Met
Representation of Ecological Communities	NO
<i>Regional vegetation representation</i>	

Vegetation Complexes	Southern River Complex
Floristic Community types	21a* and 11*
Uplands and Wetlands	Both
Habitats	Jarrah and Banksia Woodlands, and Stout Paperbark Woodland
<i>Size and Shape</i> <20ha (18ha), Oval, rectangle or symmetrical triangle. Two remnants nearby to the east and west.	
<i>Vegetation Condition</i> The area is predominantly Good to Degraded	
<i>Relationship/proximity to:</i> Naturally vegetated areas Protected areas Other regionally significant naturally vegetated areas	Few 1 Conservation Category Wetland Adjacent to west Investigation area 16 is regionally significant.
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
Comment:	
Diversity NO	
Landforms	Bassendean and Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	2
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Medium to low fauna diversity.
Comment:	
Rarity YES	
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 Poorly reserved flora: <i>Lepidosperma striatum</i>
Habitats	
Fauna	Two threatened species (Baudin's Black Cockatoo and Western Ringtail Possum) and two species listed as conservation significant on the Swan Coastal Plain (Inland Thornbill and Yellow-rumped Thornbill)
Comment:	
Maintaining Ecological Processes and Natural Systems YES	
<i>Relationship/proximity to:</i> Regional Ecological Link Creekline/River/Estuary	Part of east-west linkage – Maidens/Preston River None
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	

Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	YES
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

<i>SUMMARY NATURAL VALUES</i>
<i>Regional Significance - Assessment area against the Criteria</i>
The area meets 2 criteria, being: Rarity and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation. Previously assessed by EPA as regionally significant.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 18
Location	Lot 1 on diagram 12060 Davenport
Size (ha)	13 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry, Special Use 17 and Parks and Recreation
Current zoning - GBRS	Regional Open Space and Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Swan Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	HGM (2002)
Summary of findings	<p>Swan Complex Vegetation</p> <p><u>Unit 1 (HGM 2002, 4.1)</u> <i>Corymbia calophylla</i> and <i>Agonis flexuosa</i> var. <i>flexuosa</i> Open Forest.</p> <p><u>Unit 2 (HGM 2002, 4.2)</u> <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> and <i>Agonis flexuosa</i> var. <i>flexuosa</i> Open Forest.</p> <p><u>Unit 1 (HGM 2002, 4.3)</u> <i>Agonis flexuosa</i> var. <i>flexuosa</i> Closed Forest.</p> <p>Vegetation Condition: <u>Unit 1</u> Degraded <u>Unit 2</u> Degraded <u>Unit 3</u> Degraded</p> <p>Total Flora: Not assessed Significant Flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4); unreserved flora <i>Acacia pulchella</i> var. <i>goadbyi</i>.</p>
Vegetation & Flora Survey Limitations	HGM (2002) survey undertaken in September 2002 using 10x10m quadrats with GPS coordinates.

Regional	
Vegetation Complex	Swan Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) 1182: Medium Woodland; <i>Eucalyptus rudis</i> and <i>Melaleuca raphiophylla</i>
Floristic Community Types (FCT) *type inferred	4* and 17*
National/International Significance	No, but Regionally significant
Fauna	
Area Specific	
Fauna Survey	HGM (2002) opportunistic data only.
Summary of findings	Six wetland bird species recorded
Fauna Survey Limitations	Site was not visited by Western Wildlife or DEC survey. A comprehensive survey is likely to confirm the presence of threatened species in this area as well as considerably increasing the number of confirmed species for the site.
Regional	
National/International Significance	No data available
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	2 Conservation Category, 1 Multiple Use
Suite	N/A see Semeniuk 1998 Vol 2B
Conclusions from survey	Consistent with information given by the DEC (2007) updating GWSCP dataset (2007).

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
<i>Regional vegetation representation</i>		
Vegetation Complexes	Swan Complex	
Floristic Community types	4* and 17*	
Uplands and Wetlands	Both	
Habitats	Marri and Peppermint Forests, and Flooded Gum Forest	
<i>Size and Shape</i> <20ha (13 ha), Oval, rectangle or symmetrical triangle. Adjacent to Preston River.		
<i>Vegetation Condition</i> The area is predominantly Degraded		
<i>Relationship/proximity to:</i>		
Naturally vegetated areas	Adjacent to naturally vegetated areas	
Protected areas	Conservation Category Wetland; EPA (2003) recognised as regionally significant area to be protected.	
Other regionally significant naturally vegetated areas	Directly adjacent to Preston River; forms part of several regionally significant ecological linkages – Preston River and Maidens/Preston River.	
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed	

Comment:	
DiversityNO	
Landforms	Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	4
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Not known
Comment:	
RarityNOT KNOWN	
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 Priority flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4) 1 unreserved flora: <i>Acacia pulchella</i> var. <i>goadbyi</i>
Habitats	Likely habitat for one Schedule 1 species (Western Ringtail Possum)
Fauna	Threatened species likely to occur
Comment:	
Maintaining Ecological Processes and Natural SystemsYES	
Relationship/proximity to: Regional Ecological Link	Yes – Preston River ecological linkage and Maidens/Preston River east-west ecological linkage.
Creekline/River/Estuary	No (adjacent to Preston River and forms part of its floodplain)
Contains areas suitable for ecological restoration	yes most of remnant previously grazed
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary ImportanceNO	
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal VegetationYES	
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 2 criteria: Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation. It may also meet the Rarity criterion.
Previously assessed by EPA as regionally significant.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 19
Location	Lot 74 on Plan 40593, Davenport
Size (ha)	10 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	Industry and Parks and Recreation
Current zoning - GBRS	Industrial

Environmental Considerations - Natural Attributes	
Landforms	
<i>Southern River Complex</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex Vegetation</p> <p><u>Unit 1 (DEC 19.1)</u> Open Forest of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> and <i>Corymbia calophylla</i> over Low Open Forest of <i>Agonis flexuosa</i> var. <i>flexuosa</i> over a Herbland/Grassland.</p> <p><u>Unit 2 (DEC 19.2)</u> <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over Low Woodland of <i>Agonis flexuosa</i> var. <i>flexuosa</i>.</p> <p>Vegetation Condition: Good to Degraded</p> <p>Total Flora: not assessed Significant Flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4)</p>
Vegetation & Flora Survey Limitations	DEC (2007) roadside assessment only due to access constraints
Regional	
Vegetation Complex	Southern River Complex
Vegetation types	(Beards) 1182: Medium Woodland; <i>Eucalyptus rudis</i> and

(Beard/Smith/Hopkins)	<i>Melaleuca raphiophylla</i>
Floristic Community Types (FCT) *type inferred	11*
National/International Significance	No, but regionally significant
Fauna	
Area Specific	
Fauna Survey	No survey conducted.
Summary of findings	No data recorded
Fauna Survey Limitations	Site was not visited by Western Wildlife or DEC survey. A comprehensive survey is likely to confirm the presence of threatened species in this area as well as confirming a considerable number species for the site.
Regional	
National/International Significance	No data available
Wetlands, Creeklines, Rivers, Estuaries	
Type	Rivers and Wetlands
Management Category	1 Conservation Category, 1 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	11*	
Uplands and Wetlands	Both	
Habitats	Marri and Peppermint Forests, and Flooded Gum Forest	
Size and Shape <20ha (10ha), Oval, rectangle or symmetrical triangle. Adjacent to Preston River.		
Vegetation Condition The area is predominantly Good		
Relationship/proximity to:		
Naturally vegetated areas	Adjacent to naturally vegetated areas	
Protected areas	Conservation Category Wetland; EPA (2003) recommended protection of majority as vegetated link to Preston River	
Other regionally significant naturally vegetated areas	Directly adjacent to Preston River	
Contains areas suitable for ecological restoration	yes most of remnant previously grazed	
Comment:		
Diversity		NO
Landforms	Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	1	

Vegetation units	2
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	Fauna diversity not assessed.
Comment:	
Rarity	NOT KNOWN
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	Priority flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>
Habitats	Jarrah, Marri, Peppermint and Flooded Gum vegetation are likely habitat for at least four Schedule 1 species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Forest Red-tailed Black cockatoo and Western Ringtail Possum)
Fauna	Threatened species likely to occur
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i> Regional Ecological Link	Yes – Preston River ecological linkage and Maidens/Preston River east-west ecological linkage.
Creekline/River/Estuary	No (adjacent to Preston River and forms part of its floodplain)
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	YES
Comment: Has Conservation Category wetland within a recognised regionally significant bushland	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 2 criteria: *Maintaining Ecological Process and Natural Systems* and *General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation*. It may also meet the *Rarity* criterion.

EPA previously recommended this area to provide vegetated link to the Preston River.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 21
Location	Lot 5 on plan 7878 Boyanup-Picton Rd, Picton East
Size (ha)	12 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S48A CRN 221053.

Planning Considerations	
General	
Current zoning – Local	Rural
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Southern River Complex</p> <p>Vegetation:</p> <p><u>Unit 1 (DEC 2007, 21.1)</u> Open Forest of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Open Woodland of <i>Melaleuca preissiana</i> over weedy Grassland and Herbland.</p> <p><u>Unit 1 (DEC 2007, 21.2)</u> Low Open Forest of <i>Agonis flexuosa</i> var. <i>flexuosa</i>, <i>Banksia attenuata</i> and <i>B. ilicifolia</i> with Emergent <i>Corymbia calophylla</i> over weedy Grassland and Herbland.</p> <p><u>Unit 1 (DEC 2007, 21.3)</u> Open Woodland of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Woodland of <i>Melaleuca raphiophylla</i> over weedy Grassland and Herbland.</p> <p>Vegetation Condition: Degraded (burnt in June 2007 so condition must be reassessed)</p> <p>Total Flora: not assessed</p> <p>Significant Flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i></p>
Vegetation & Flora	DEC (2007) survey undertaken 27 September 2007, no plots.

Survey Limitations	
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a*
National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September 2007.
Summary of findings	Five bird species recorded. Two native mammal species including threatened Western Ringtail Possum.
Fauna Survey Limitations	DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	2 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River complex	
Floristic Community types	21a*	
Uplands and Wetlands	Both	
Habitats	Marri and Peppermint Forests, and Flooded Gum Forest	
Size and Shape		
<20ha (12ha) but is adjacent to much larger area, rectangle shape.		
Vegetation Condition		
The area is predominantly Degraded.		
Relationship/proximity to:		
Naturally vegetated areas	The area is naturally vegetated, adjacent to other naturally vegetated areas	
Protected areas	none	
Other regionally significant naturally vegetated areas	Directly adjacent to east is regionally significant Investigation area 9.	
Contains areas suitable for ecological restoration	yes most of remnant previously grazed and recently burnt.	
Comment:		

Diversity	NO	
Landforms	Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	1	
Vegetation units	3	
Flora	Wetland and upland diversity	
Habitats	Contains both uplands and wetlands.	
Fauna	Medium to low fauna diversity. (small area, vegetation degraded).	
Comment:		
Rarity	YES	
Vegetation Complex <10% remaining	None	
Threatened Ecological Communities	None	
Flora	1 Priority flora: <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	
Habitats	Open <i>Eucalyptus rudis</i> Forest over Low Open <i>Melaleuca preissiana</i> Woodland, Low Open <i>Agonis flexuosa</i> Forest over <i>Banksia attenuata</i> and <i>B. ilicifolia</i> , and Open <i>Eucalyptus rudis</i> Woodland over Low <i>Melaleuca raphiophylla</i> Woodland are habitat for threatened Western Ringtail Possum and likely habitat for Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, and Baudin's Black Cockatoo	
Fauna	One Schedule 1 species (Western Ringtail Possum) recorded and three other Schedule 1 species may occur (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo, Baudin's Black Cockatoo)	
Comment:		
Maintaining Ecological Processes and Natural Systems	YES	
Relationship/proximity to:		
Regional Ecological Link	Yes, part of McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup north-south ecological linkage.	
Creekline/River/Estuary	No	
Contains areas suitable for ecological restoration	yes parts of remnant previously grazed	
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities		
Comment:		
Scientific or Evolutionary Importance	NO	
Comment:		
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation		
NO		
Comment:		

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 2 criteria, being: Rarity and Maintaining Ecological Processes and Natural Systems

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 22
Location	Lots 2009 and 2010 on plan 43721 Picton East
Size (ha)	2.4 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes over Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	Swan Complex Vegetation <u>Unit 1 (DEC 2007, 22.1)</u> Low Open Forest of <i>Agonis flexuosa</i> , <i>Eucalyptus marginata</i> and <i>Banksia attenuata</i> over Shrubland of <i>Xanthorrhoea brunonis</i> over weedy Grassland and Herbland. Vegetation Condition: Degraded Total Flora: Not assessed Significant Flora: Not assessed
Vegetation & Flora Survey Limitations	DEC (2007) edge inspection undertaken 26 September 2007, no plots.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a*

National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Site inspection and opportunistic data recorded by DEC during September 2007.
Summary of findings	Three bird species recorded.
Fauna Survey Limitations	DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	Few data available but likely habitat for one Schedule 1 mammal species (Western Ringtail Possum) and several Schedule 1 bird species.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetland
Management Category	Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	21a*	
Uplands and Wetlands	Uplands	
Habitats	Jarrah and Peppermint Forests	
Size and Shape <20ha (2.4ha), compact oval shape but very small.		
Vegetation Condition The area is predominantly Degraded.		
Relationship/proximity to:		
Naturally vegetated areas	Area is naturally vegetated, isolated from other naturally vegetated areas to north and south.	
Protected areas		
Other regionally significant naturally vegetated areas		
Contains areas suitable for ecological restoration	yes most of remnant previously grazed	
Comment:		
Diversity		NO
Landforms	Pinjarra Plain	
Vegetation Complexes	1	
Floristic Community Types	1	
Vegetation units	1	
Flora	Medium to low flora diversity.	
Habitats	Contains only uplands.	

Fauna	Medium to low fauna diversity. (small area, vegetation degraded).
Comment:	
Rarity	NOT KNOWN
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	None
Habitats	Jarrah and Peppermint Forests – likely habitat for one Schedule 1 mammal species (Western Ringtail Possum) and several Schedule 1 bird species
Fauna	Several Schedule 1 species may occur based on available habitats
Comment:	
Maintaining Ecological Processes and Natural Systems	NO
<i>Relationship/proximity to:</i> Regional Ecological Link	No – too small and not good enough condition to be retained as part of McLarty ecological linkage
Creekline/River/Estuary	No
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	
NO	
Comment:	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area may meets one criterion: Rarity but further survey required to confirm.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 23
Location	Lot 75 on plan 21441 Dardanup West
Size (ha)	3 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003), S48A CRN220979.

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Combination of Bassendean Dunes and Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Swan Complex Vegetation</p> <p><u>Unit 1 (DEC 2007, 23.1)</u> Woodland of <i>Agonis flexuosa</i> var. <i>flexuosa</i> and <i>Eucalyptus marginata</i> over weedy Herbland and Grassland.</p> <p><u>Unit 1 (DEC 2007, 23.2)</u> Open Woodland of <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> over Low Open Woodland of <i>Melaleuca raphiophylla</i> and <i>M. preissiana</i> over Very Open Sedgeland of <i>Baumea articulata</i> and weedy Herbland.</p> <p>Vegetation Condition: Degraded to Completely Degraded</p> <p>Total Flora: Not assessed</p> <p>Significant Flora: 1 Priority flora <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4)</p>
Vegetation & Flora Survey Limitations	DEC (2007) survey undertaken 27 September 2007, relevee sites no plots.
Regional	
Vegetation Complex	Southern River Complex

Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a* and 11*
National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during September 2007.
Summary of findings	Eighteen bird species recorded including two species listed as conservation significant on the Swan Coastal Plain (Common Bronzewing and Inland Thornbill). Two native mammal species including threatened Western Ringtail Possum. One reptile species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	No data available
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Multiple Use
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	21a* and 11*	
Uplands and Wetlands	Both	
Habitats	Jarrah and Peppermint Forests, and Flooded Gum Forest	
Size and Shape		
<20ha (3ha), linear unconsolidated shape.		
Vegetation Condition		
The area is predominantly Degraded.		
Relationship/proximity to:		
Naturally vegetated areas	Area is naturally vegetated surrounded by Pine plantation.	
Protected areas	None	
Other regionally significant naturally vegetated areas	South of Area 12, east of Area 11, but not directly adjacent.	
Contains areas suitable	yes most of remnant previously grazed	

<i>for ecological restoration</i>	
Comment:	
Diversity	NO
Landforms	Bassendean Dunes over Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	2
Flora	Wetland and upland but low diversity due to Degraded condition.
Habitats	Contains both uplands and wetlands.
Fauna	Medium to low fauna diversity. (small area, vegetation degraded).
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	1 Priority flora <i>Eucalyptus rudis</i> subsp. <i>cratyantha</i> (P4)
Habitats	Jarrah and Peppermint Forests - known habitat for threatened Western Ringtail Possum and regionally significant bird species. Likely habitat for other threatened bird species. Flooded Gum Forest - known habitat for threatened Western Ringtail Possum and regionally significant bird species. Likely habitat for other threatened bird species.
Fauna	One Schedule 1 species (Western Ringtail Possum) recorded and other Schedule 1 species may occur.
Comment:	
Maintaining Ecological Processes and Natural Systems	NO
<i>Relationship/proximity to:</i>	
Regional Ecological Link	No
Creekline/River/Estuary	No
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	NO
Comment:	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 1 criterion: Rarity

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 24
Location	Lot 352 on plan 230087 Dardanup West
Size (ha)	10 ha

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	N/A
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Bassendean Dune over Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	Southern River Complex Vegetation <u>Unit 1 (DEC 2007, 24.1)</u> Open Forest of <i>Corymbia calophylla</i> , <i>Eucalyptus marginata</i> and <i>Agonis flexuosa</i> var. <i>flexuosa</i> over Low Open Forest of <i>Banksia ilicifolia</i> and <i>B. attenuata</i> over Mixed Low Open Shrubland. Vegetation Condition: Degraded Total Flora: Not assessed Significant Flora: Not assessed
Vegetation & Flora Survey Limitations	DEC (2007) survey undertaken 11 October 2007, relevee sites no plots.
Regional	
Vegetation Complex	Southern River Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 1000: Mosaic: Medium forest; jarrah-marri/Low woodland; Banksia/Low forest; Melaleuca spp.
Floristic Community Types (FCT) *type inferred	21a*

National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Level 1 reconnaissance survey carried out in September 2006 by Western Wildlife for Ecoscape (2007). Opportunistic records of fauna only, plus relevant database searches. Site inspection and opportunistic data recorded by DEC during October 2007.
Summary of findings	Nineteen bird species recorded including one threatened species (Baudin's Black Cockatoo) and four species listed as conservation significant on the Swan Coastal Plain (Little Eagle, Inland Thornbill, Yellow-rumped Thornbill, and New Holland Honeyeater). Three native mammal species including threatened Western Ringtail Possum. One reptile species.
Fauna Survey Limitations	Site was only visited briefly by Western Wildlife as part of a short site visit and DEC site visit was opportunistic only. A comprehensive (trapping) survey is likely to increase the number of species confirmed on the site.
Regional	
National/International Significance	One Schedule 1 bird species (Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	None
Management Category	None
Suite	N/A

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		NO
Regional vegetation representation		
Vegetation Complexes	Southern River Complex	
Floristic Community types	21a*	
Uplands and Wetlands	Upland	
Habitats	Marri and Peppermint Forest	
Size and Shape		
<20ha (10ha), compact rectangular shape.		
Vegetation Condition		
The area is predominantly Degraded		
Relationship/proximity to:		
Naturally vegetated areas	None	
Protected areas		
Other regionally significant naturally vegetated areas		
Contains areas suitable for ecological restoration	yes most of remnant previously grazed	
Comment:		
Diversity	NO	

Landforms	Bassendean Dune over Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	1
Vegetation units	1
Flora	Low to medium diversity
Habitats	Contains upland
Fauna	Medium to low fauna diversity. (small area, vegetation degraded).
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	None
Threatened Ecological Communities	None
Flora	Not assessed
Habitats	Marri, Jarrah and Peppermint Forests – known habitat for one Schedule 1 bird species (Baudin's Black Cockatoo), one Schedule 1 mammal species (Western Ringtail Possum), four species listed as conservation significant on the Swan Coastal Plain (Little Eagle, Inland Thornbill, Yellow-rumped Thornbill, and New Holland Honeyeater). Other threatened species likely to occur
Fauna	Two Schedule 1 species (Baudin's Black Cockatoo and Western Ringtail Possum), and four species listed as conservation significant on the Swan Coastal Plain. Two other Schedule 1 species may occur (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i> Regional Ecological Link	Part of a regional ecological linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinnup – north-south ecological linkage)
Creekline/River/Estuary	Preston River to the west
<i>Contains areas suitable for ecological restoration</i>	yes most of remnant previously grazed
<i>Size and Shape, Uplands and Wetlands & Vegetation Condition</i> - see Representation of Ecological Communities	
Comment:	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	NO
Comment:	

SUMMARY NATURAL VALUES

Regional Significance - Assessment area against the Criteria

The area meets 2 criteria: Rarity and Maintaining Ecological Processes and Natural Systems.

INFORMATION	COMMENT
Background Information	
Area Name	Investigation Area 25
Location	Lot 7 on Plan 21434, Dardanup West
Size (ha)	5 ha
Reason for assessment	Structure Plan for Preston Industrial Park

Environmental Considerations	
General Policy	
Environmental Protection Policies (e.g. SCP Lakes)	<i>Environmental Protection (Swan Coastal Lakes) Policy 1992 (EPP Lake)</i>
Previous Environmental Assessments	
Relevant Previous Assessments	S16(j) EPA Bulletin 902 (1998), S48A EPA Bulletin 1108 (2003).

Planning Considerations	
General	
Current zoning – Local	General Farming
Current zoning - GBRS	Rural

Environmental Considerations - Natural Attributes	
Landforms	
<i>Pinjarra Plain</i>	
Vegetation & Flora	
Area Specific	
Vegetation & Flora Survey	DEC (2007)
Summary of findings	<p>Swan Complex Vegetation <u>Unit 1 (DEC 2007, 25.1)</u> <i>Corymbia calophylla</i>, <i>Eucalyptus marginata</i> and <i>Agonis flexuosa</i> var. <i>flexuosa</i> Open Forest over <i>Banksia attenuata</i> Low Open Woodland over <i>Pteridium esculentum</i> Herbland. <u>Unit 2 (DEC 2007, 25.2)</u> <i>Melaleuca raphiophylla</i> Low Woodland over <i>M. ?lateritia</i> over Mixed Sedgeland and Open Water</p> <p>Vegetation Condition: <u>Unit 1</u> Good <u>Unit 2</u> Very Good Total Flora: Not assessed Significant Flora: Not assessed</p>
Vegetation & Flora Survey Limitations	DEC (2007) survey undertaken 11 October 2007, roadside inspection no plots.
Regional	

Vegetation Complex	Guildford Complex
Vegetation types (Beard/Smith/Hopkins)	(Beards) Veg Assoc 968: Medium Woodland; jarrah, marri and wandoo
Floristic Community Types (FCT) *type inferred	4* and 21c*
National/International Significance	
Fauna	
Area Specific	
Fauna Survey	Site inspection from boundary and opportunistic data recorded by DEC during October 2007.
Summary of findings	Eighteen bird species recorded including two threatened species (Red-tailed Black Cockatoo and Carnaby's Black Cockatoo) and one species listed as conservation significant on the Swan Coastal Plain (Purple Swamphen). Three amphibian species. An important bird breeding wetland with significant numbers of several bird species breeding in October 2007 including Grey Teal, Little Pied Cormorant, and Australian White Ibis. Extent of other species breeding needs further assessment.
Fauna Survey Limitations	Site was only examined from the property boundary. Extent of breeding and seasonal use by birds needs further survey.
Regional	
National/International Significance	Two Schedule 1 bird species (Red-tailed Black Cockatoo, Carnaby's Black Cockatoo). Other threatened species likely to occur.
Wetlands, Creeklines, Rivers, Estuaries	
Type	Wetlands
Management Category	1 Multiple Use, 1 EPP
Suite	N/A See Semeniuk 1998 Vol 2B

Consideration Against Criteria		Criterion Met
Representation of Ecological Communities		YES
Regional vegetation representation		
Vegetation Complexes	Guildford Complex	
Floristic Community types	4* and 21c*	
Uplands and Wetlands	Both	
Habitats	Marri and Peppermint Forests, and Paperbark Forest	
Size and Shape		
<20ha (5ha), Oval, rectangle or symmetrical triangle.		
Vegetation Condition		
The area is predominantly Very Good		
Relationship/proximity to:		
Naturally vegetated areas	Several	
Protected areas	EPP Lake	
Other regionally significant naturally vegetated areas	Close to several regionally significant areas.	
Contains areas suitable	yes part of remnant previously grazed	

<i>for ecological restoration</i>	
Comment:	
Diversity	YES
Landforms	Pinjarra Plain
Vegetation Complexes	1
Floristic Community Types	2
Vegetation units	2
Flora	Wetland and upland diversity
Habitats	Contains both uplands and wetlands.
Fauna	An important bird breeding wetland with significant diversity and numbers of several species breeding in October 2007 including Grey Teal, Little Pied Cormorant, and Australian White Ibis
Comment:	
Rarity	YES
Vegetation Complex <10% remaining	Yes – Guildford complex
Threatened Ecological Communities	Not assessed
Flora	Not assessed
Habitats	Marri and Peppermint Forests – significant breeding habitat for waterbirds and significant habitat for Red-tailed Black Cockatoo and Carnaby's Black Cockatoo and at least one conservation significant Swan Coastal Plain bird species Flooded Gum Forest - significant breeding habitat for waterbirds and significant habitat for Red-tailed Black Cockatoo and Carnaby's Black Cockatoo and at least one conservation significant Swan Coastal Plain bird species
Fauna	Two Schedule 1 species (Red-tailed Black Cockatoo and Carnaby's Black Cockatoo) and one species listed as conservation significant on the Swan Coastal Plain (Purple Swamphen)
Comment:	
Maintaining Ecological Processes and Natural Systems	YES
<i>Relationship/proximity to:</i>	
Regional Ecological Link	No
Creekline/River/Estuary	No
<i>Contains areas suitable for ecological restoration</i>	yes part of remnant previously grazed
Size and Shape, Uplands and Wetlands & Vegetation Condition - see Representation of Ecological Communities	
Comment: An important bird breeding wetland with significant diversity and numbers of birds breeding in October 2007	
Scientific or Evolutionary Importance	NO
Comment:	
General Criteria for the Protection of Wetland, Streamline and Estuarine Fringing Vegetation and Coastal Vegetation	
YES	
Comment: EPP lake within a regionally significant bushland	

SUMMARY NATURAL VALUES***Regional Significance - Assessment area against the Criteria***

The area meets 4 criteria: Representation, Rarity, Maintaining Ecological Process and Natural Systems, and General Criteria for the Protection of Wetland Streamline and Estuarine Fringing Vegetation and Coastal Vegetation.