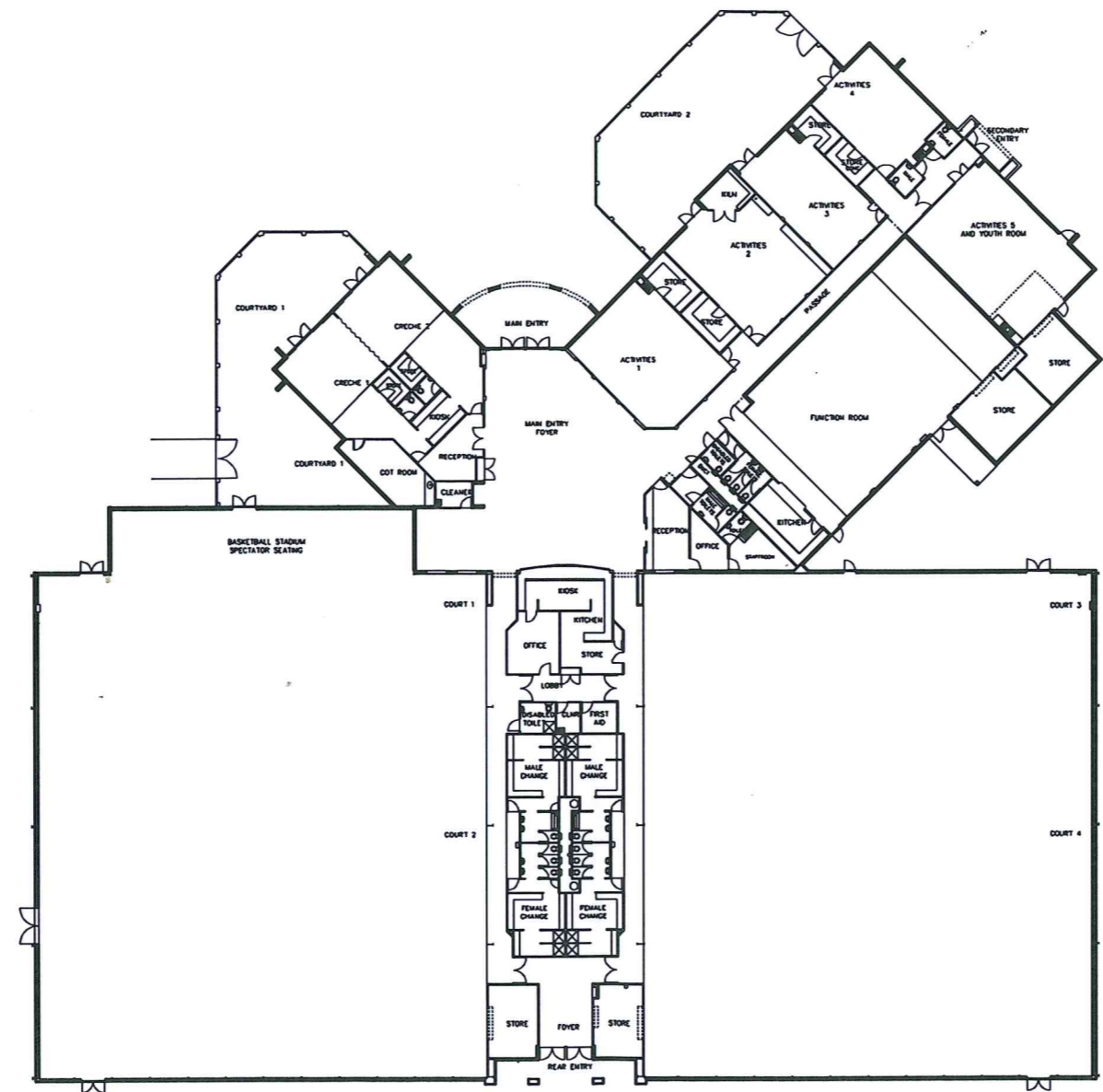


DISCLAIMER: While every care is taken to ensure the accuracy of this data, the City of Joondalup makes no representations or warranties about its accuracy, completeness or suitability for any particular purpose and disclaims all liability for all expenses, losses, damages and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

Friday, 22 November 2013


1:6474

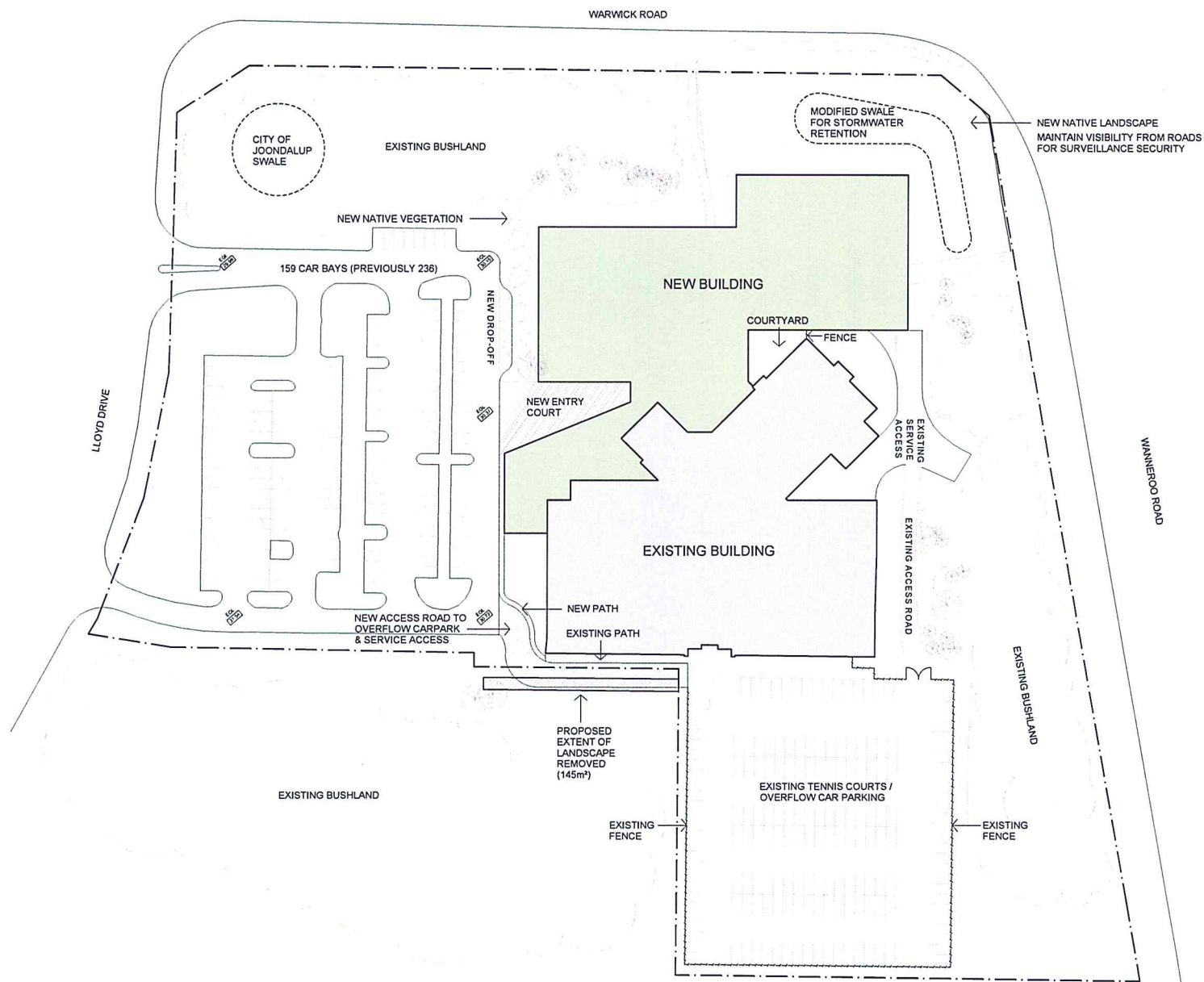




PLAN 1:500

TOTAL TENNIS COURT LEASE AREA = 4914m2

AREA:	DRAWING TITLE: BUILDING AREA	ADDRESS: 480 WARWICK ROAD, WARWICK	<div>City of Joondalup Building Asset Mngmt</div> <div>PO Box 21, Joondalup Western Australia, 6919 Telephone: (08) 9400 4000 Facsimile: (08) 9400 4501</div> <div></div>	DATE: DEC 10 SCALE: 1:500 @ A3 DRAWN: D.W. APPROVED:	BUILDING No: B2123 DRAWING No: GIS	BUILDING NAME: WARWICK LEISURE CENTRE REV No: A LEASE No: 7
TOTAL BUILDING AREA: 4546.3m ² <small>THIS DRAWING IS THE PROPERTY OF THE CITY OF JOONDALUP BUILDING ASSET MANAGEMENT AND MAY NOT BE COPIED OR USED WITHOUT CONSENT. CHECK ALL DIMENSIONS BEFORE FABRICATION AND AGAINST ON SITE DIMENSIONS</small>	THIS DRAWING TO BE PLOTTED ON A3 SIZE PAPER - DO NOT SCALE, IF IN DOUBT ENQUIRE WITH ASSET MGT 94004340					

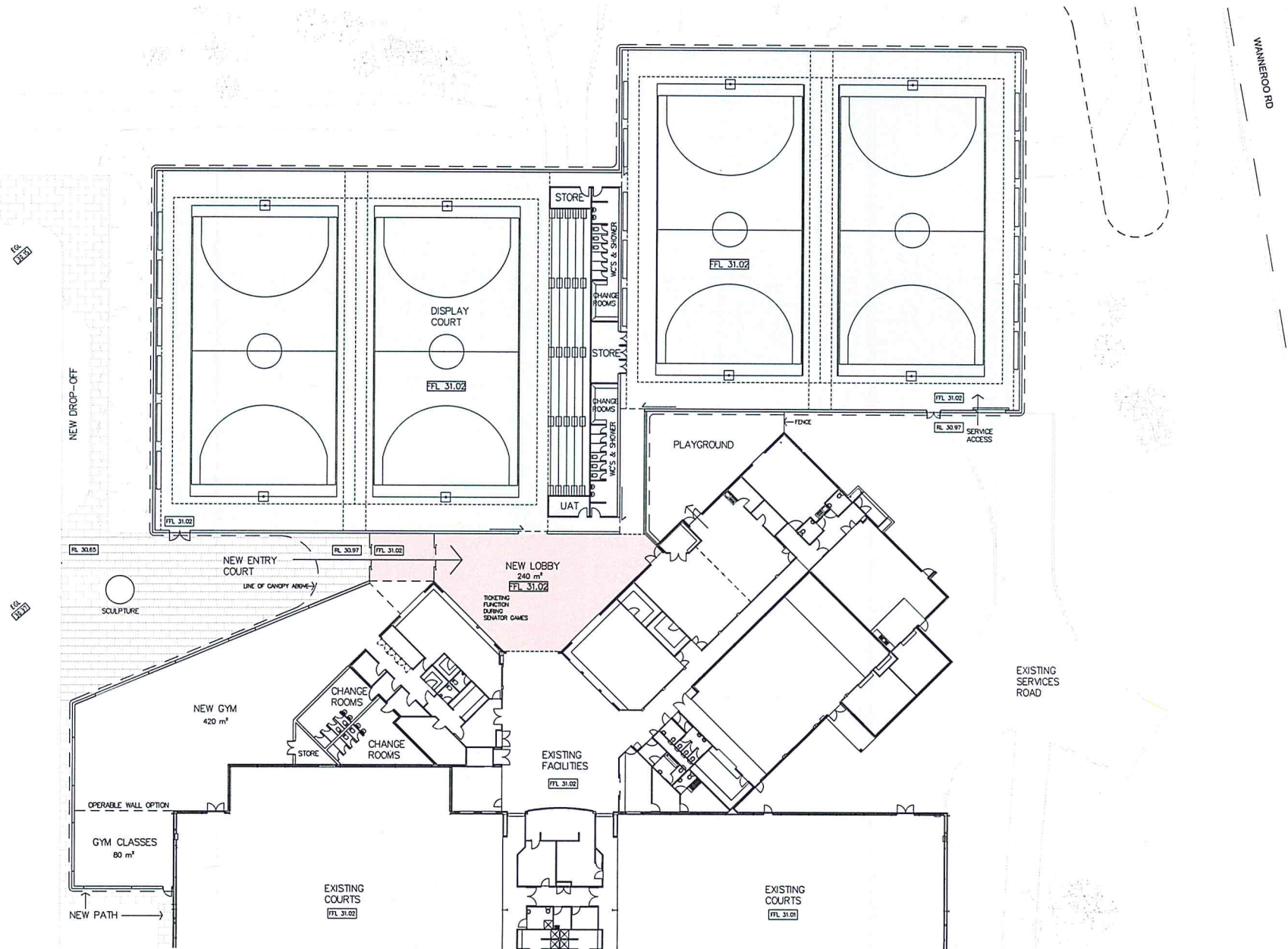


warwick leisure centre expansion
site plan

warwick rd, warwick

SK01
12-114
1:500 @ A1
REV. A
july 2013





warwick leisure centre expansion
ground plan

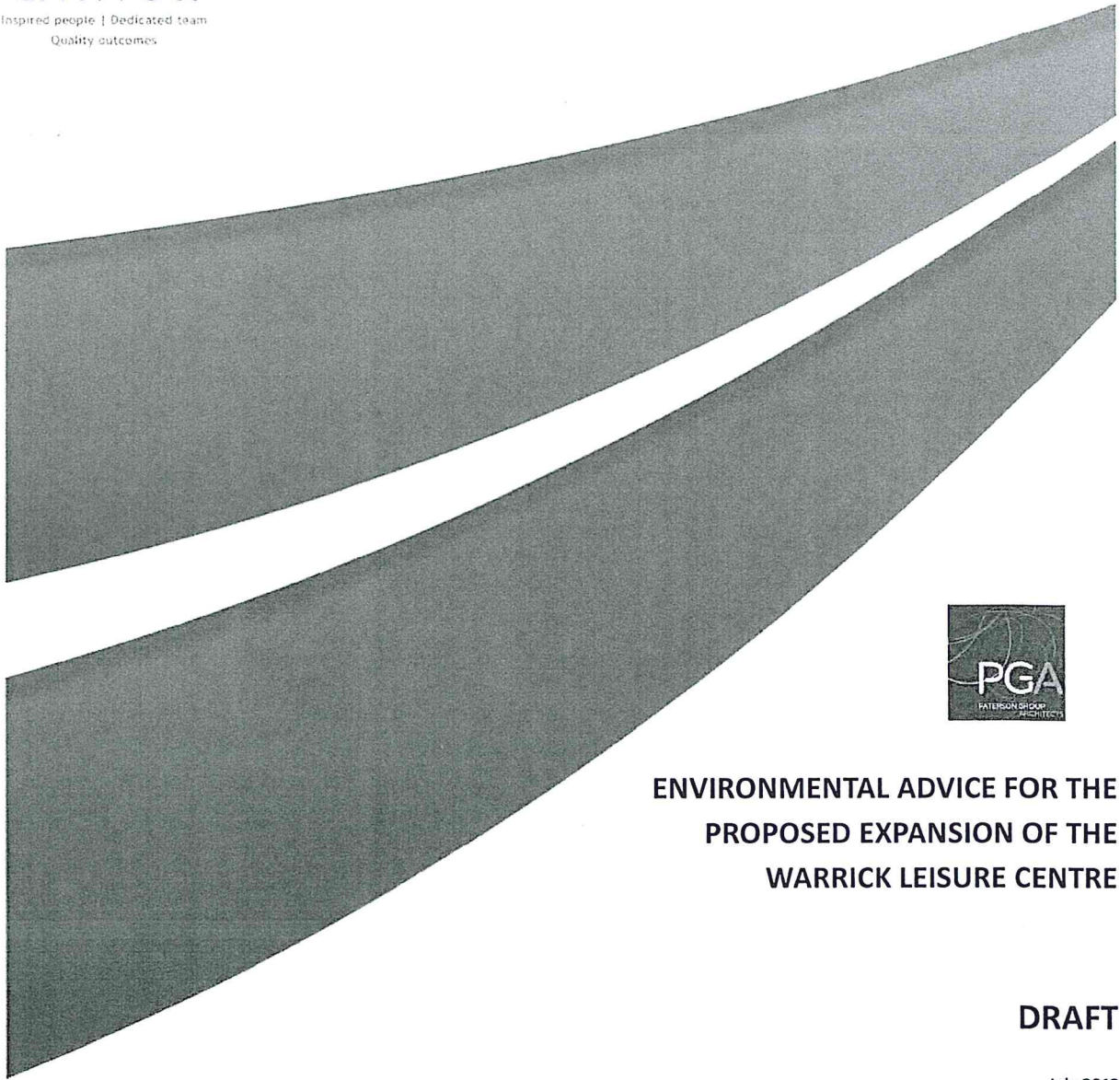
warwick rd, warwick

SK03 REV. 0
12-114 JULY 2013
0 1:200 @ A1 10m



COST ANALYSIS

Playing Courts	m ²	3,300	\$ 1,250	\$ 4,125,000
Gym	m ²	590	2,100	1,239,000
Lobby	m ²	240	2,100	504,000
Toilets/Changerooms	m ²	115	2,800	322,000
Refurbished Gym ancillaries	m ²	200	750	150,000
Refurbished Offices	m ²	120	500	60,000
Refurbished Crèche	m ²	155	750	116,250
Refurbished Space to establish Café	m ²	81	1,500	121,500
External Works & Services				792,250
Estimated Total Construction Cost				<u>\$ 7,430,000</u>
Design Contingency (5%)				370,000
Construction Contingency (5%)				400,000
Consultants Fees (9%)				750,000
ESTIMATED TOTAL PROJECT COST				<u>\$ 8,950,000</u>
GST excluded				<u>\$ 895,000</u>



**ENVIRONMENTAL ADVICE FOR THE
PROPOSED EXPANSION OF THE
WARRICK LEISURE CENTRE**

DRAFT

July 2013



ENVIRONMENTAL ADVICE FOR THE PROPOSED EXPANSION OF THE WARRICK LEISURE CENTRE

DRAFT

July 2013

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Paterson Group Architects

Project Director: Cathy Galli
Project Manager: Vi Saffer
Report No. 6107/R01/V1
Date: July 2013



Perth

PO Box 8177
Subiaco East WA 6008
33 Ventnor Avenue
West Perth WA 6005

Ph. 08 6260 0700

www.umwelt.com.au

Executive Summary

The Warwick Leisure Centre is operated by the Churches of Christ Sport and Recreation Association Incorporated and owned by the City of Joondalup. The Centre is located in an area known as the 'Warwick Open Space Conservation Area' which is registered as Bush Forever Site No. 202.

The Churches of Christ Sport and Recreation Association Incorporated propose to clear parts of Bush Forever Site No. 2026107 to expand the Warwick Leisure Centre. Plans for the expansion have been prepared by Paterson Group Architects. Umwelt (Australia) Pty Ltd (Umwelt) was engaged by Paterson Group Architects on behalf of the Churches of Christ Sport and Recreation Association Incorporated to provide environmental advice in relation to the proposed clearing within Bush Forever Site No. 202.

The environmental assessment was conducted in accordance with the Environmental Protection Authority and Department of Environment and Conservation Position Statements and Guidelines.

A desktop study was undertaken ahead of the field survey using resources available through database searches, available literature and previous reporting.

Warwick Open Space Conservation Area is also known as the Warwick Bushland and a "Friends of Warwick Bushland" group have surveyed and manage the area.

Previous surveys have tallied 293 flora species consisting of 181 native taxa and 112 weed taxa. Three species of conservation significance were noted at that time one of which is protected under State legislation, namely *Jacksonia sericea* (Priority 3).

At least four species of frog have been recorded in the area and of the many invertebrates recorded, the Graceful Sun Moth *Synemon gratiosa* (Priority 4) is listed on the Department of Parks and Wildlife Threatened and Priority Fauna database. Eleven species of reptile have been recorded in the Warwick Bushland. Of these, *Diplodactylus polyophthalmus* Speckled Stone Gecko was considered of conservation significance but is not protected under State or Federal legislation. Of the 70 bird species that have been recorded within the Warwick Bushland, Carnaby's Black-cockatoo *Calyptrorhynchus latirostris* is classified as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Schedule 1 under the *Wildlife Conservation Act 1950*.

Using the map of proposed disturbance as provided by Paterson Group Architects, it was determined that while many of the trees and bushes to the north of the current building including those in the car park are native to Western Australia, most were planted there after the Centre was built. Similarly, vegetation flanking the western facade of the existing building was most likely planted there after the centre was built. Vegetation proposed to be cleared to the south of the existing building comprises the northern boundary of part of the native bushland of Bush Forever Site No. 202.

Given the location and extent of the proposed expansion of the established Warwick Leisure Centre, the proposed action is not likely to have a significant impact on a matter of national environmental significance as recognised under the EPBC Act. Therefore, it is considered that the proposed expansion for the Warwick Leisure Centre does not warrant referral to the Department of Sustainability, Environment, Water, Population and Communities.

However, given that the proposed disturbance will include the clearing of native vegetation, a Clearing Permit under Part V of the Environmental Protection Act 1986 will be required. Other considerations that will minimise the impact on the bushland have been provided.

TABLE OF CONTENTS

1.0	Introduction	1.1
1.1	Project Background and Location	1.1
2.0	Existing Environment.....	2.1
2.1	Biogeographic Region	2.1
2.2	Bush Forever Site No. 202	2.1
3.0	Environmental Assessment	3.1
3.1	Survey Methodology	3.1
3.1.1	Desktop Study	3.1
3.2	Taxonomy and Nomenclature	3.1
3.3	Field Survey	3.2
3.3.1	Survey Team	3.2
3.3.2	Licence and Permits	3.2
3.3.3	Access	3.2
3.4	Approach to Survey	3.3
3.4.1	Limitations	3.3
3.5	Results	3.3
3.5.1	Desktop Review.....	3.3
3.5.2	Reconnaissance Survey.....	3.5
3.5.3	Environmental Assessment.....	3.6
4.0	References	4.1

FIGURES

After page no

1.1	Locality Map	1.1
2.1	Bush Forever Site (2002).....	2.1

APPENDICES

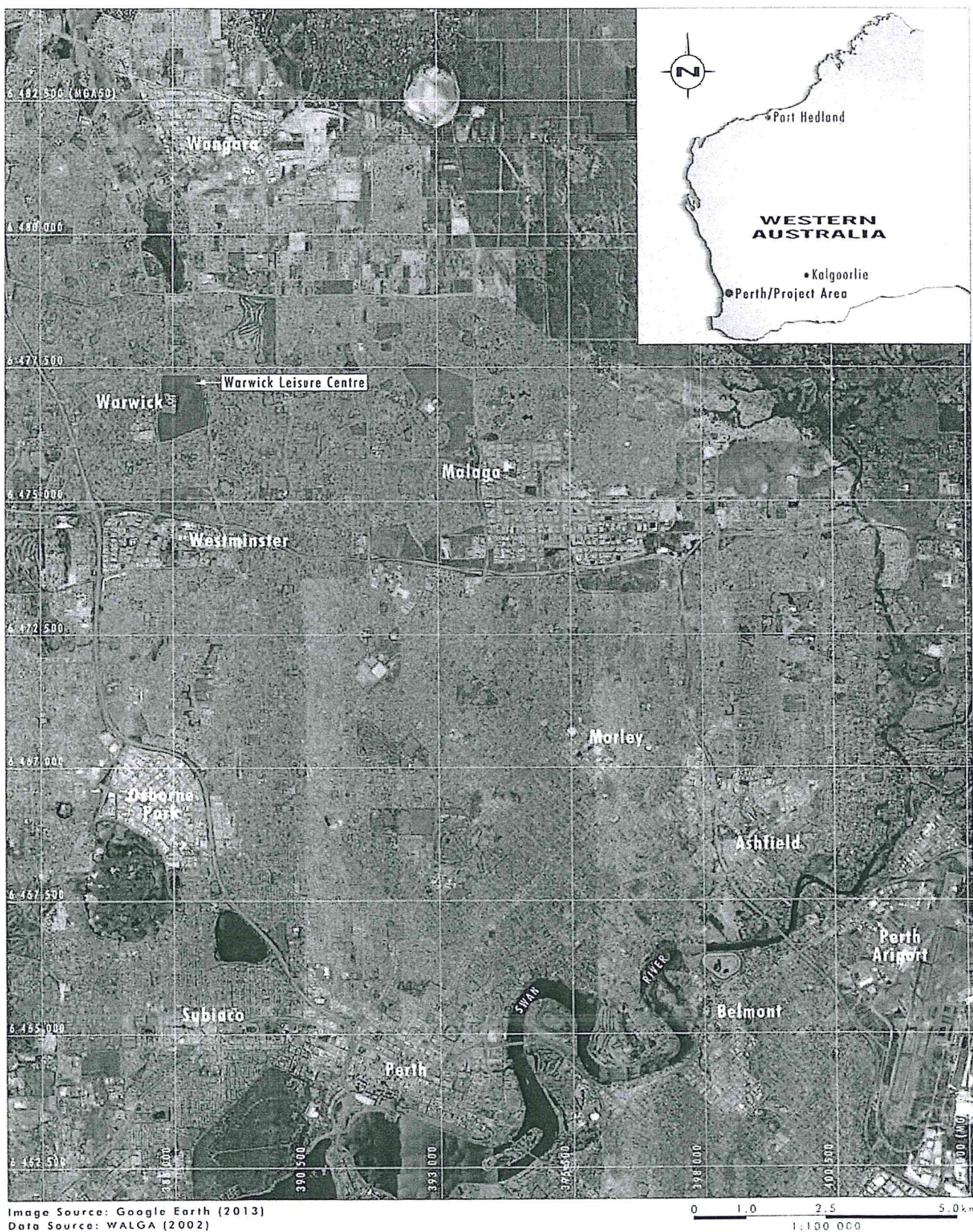
1	Definitions of Conservation Categories and Codes for Flora and Fauna
2	Vegetation Condition Scale (Keighery, 1994)

1.0 Introduction

1.1 Project Background and Location

The Warwick Leisure Centre is operated by the Churches of Christ Sport and Recreation Association Incorporated and owned by the City of Joondalup. The Centre is located in an area known as the 'Warwick Open Space Conservation Area' which is registered as Bush Forever Site No. 202 (**Figure 1.1**). Bush Forever Policy was developed to fulfil the Western Australian government's commitment to prepare a strategic plan for the conservation of bushland on the Swan Coastal Plain. Bush Forever is designed to identify, protect and manage regionally significant bushland in order to achieve a sustainable balance between conservation of bushland and developments in metropolitan Perth.

The Churches of Christ Sport and Recreation Association Incorporated propose to clear parts of Bush Forever Site No. 202 to expand the Warwick Leisure Centre. Umwelt (Australia) Pty Ltd (Umwelt) was engaged by Paterson Group Architects on behalf of the Churches of Christ Sport and Recreation Association Incorporated to provide environmental advice in relation to the proposed clearing within Bush Forever Site No. 202.



Legend

Bush Forever Site (2002)

FIGURE 1.1
Locality Map

2.0 Existing Environment

2.1 Biogeographic Region

The Interim Biogeographic Regionalisation for Australia (IBRA) classification system describes 85 biogeographic regions which cover Australia. The bioregions are defined on the basis of geology, landforms, climate, vegetation and fauna (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2013a). The Project area is located in the Swan Coastal Plain 2 (SWA2 – *Swan Coastal Plain subregion*).

The Swan Coastal Plain sub-region is characterised by alluvial river flats, colluvial and aeolian sands and coastal limestone (Mitchell *et al.*, 2002). The colluvial and alluvial areas support Marri while limestone supports heath and/or Tuart woodlands (Mitchell *et al.*, 2002). The subregion also contains a series of seasonal wetlands (Mitchell *et al.*, 2002).

2.2 Bush Forever Site No. 202

Bush Forever Site No. 202 is also known as the Warwick Open Space Conservation Area (Warwick Bushland) and extends over 58.1 hectares (ha) (Government of WA, 2000) (**Figure 2.1**).

Regional information includes:

- **Landform and Soils:**

Spearwood Dunes: sands derived from Tamala Limestone;

- **Vegetation complexes:**

Spearwood Dunes: Karrakata Complex – Central and South;

- **Floristic Community types:**

Supergroup 4: Uplands centred on Spearwood and Qunidalup Dunes

28 Spearwood *Banksia attenuata* or *B. Attenuata* – *Eucalyptus* woodlands.



Image Source: Google Earth (2011)
Data Source: WALGA (2002)

0 100 200 400m
1:7 500

Legend

□ Bush Forever Site (2002)

FIGURE 2.1

Bush Forever Site (2002)

3.0 Environmental Assessment

3.1 Survey Methodology

The environmental assessment was conducted in accordance with the following Position Statements and Guidelines:

- Environmental Protection Authority (EPA) Position Statement No 3 "Terrestrial Biological Surveys as an Element of Biodiversity Protection" (EPA, 2002);
- Guidance Statement No. 56 "Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia" (EPA, 2004a);
- Guidance Statement No. 51 "Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia" (EPA, 2004b); and
- "Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment" (EPA and Department of Environment and Conservation (DEC), 2010).

3.1.1 Desktop Study

A desktop study was undertaken ahead of the field survey using resources available through database searches, available literature and previous reporting.

Objectives of the desktop to study were to identify historic records of conservation significant flora and fauna within the survey area.

Conservation categories and descriptions of the conservation status of flora and fauna are provided in **Appendix 1**.

3.1.1.1 Database searches

- Listed Matters of National Environmental Significance (MNES) and other matters protected under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) in the vicinity of the survey area were searched for using the on-line 'Protected Matters Search Tool' (DSEWPac, 2013a). Coordinates for the point search were: - 31.83528, 115.82 and included a 10 km buffer.
- Department of Parks and Wildlife (DPaW) on-line NatureMap Species Report. Coordinates for the circle search were 115°49' 11" E, 31°50' 07" S and included a 10 km buffer.

* DPaW Threatened and Priority Flora and Fauna databases were not searched at this stage of the assessment.

Note: given that this assessment was to provide environmental advice, only species of conservation significance recorded from the above two database searches have been provided in this report.

3.2 Taxonomy and Nomenclature

The nomenclature in this report for flora is consistent with that published by DPaW on FloraBase (WAH, 2008). Nomenclature and taxonomic order for fauna are presented in

accordance with advice in the '*Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*' (EPA/DEC, 2010). Specifically, for herpetofauna and mammals, nomenclature and taxonomic order are based on the Western Australian Museum (WAM) *Checklist of the Vertebrates of Western Australia*, and for avifauna, Christidis and Boles (2008). The authorities used for herpetofauna are Doughty (2013) and for mammals How *et al.* (2013). Latin names of species with corresponding common (English) names are presented in all tables and appendices. Common names are used for birds in text, whilst Latin names are used for amphibians, reptiles and mammals as not all of these species have common names.

It is noted that some species names from reviewed literature and from the DPaW NatureMap Species Report are dated and not consistent with the nomenclature from FloraBase and from that required to be used as directed in the '*Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*' (EPA/DEC, 2010).

3.3 Field Survey

The reconnaissance survey was conducted by Dr Vi Saffer (Umwelt) on 12 July 2013. A total of two hours were spent in the immediately vicinity of the Warwick Leisure Centre.

The objectives of this assessment were to:

- determine if any native vegetation was likely to be cleared or disturbed for the proposed expansion of the Warwick Leisure Centre and, if present;
- generally identify vegetation associations within the area;
- identify local habitat that may be of significance to fauna indigenous to WA;
- identify local habitat that may be of significance to conservation significant fauna;
- identify fauna of conservation significance in the area; and
- provide environmental advice in relation to what, if any, further work is required prior to a development approval application being submitted.

3.3.1 Survey Team

The survey team comprised of Principal Zoologist Vi Saffer who has a PhD in Biological Science and has 20 years experience conducting Environmental Impact Assessment, Level 1 and 2 Fauna Surveys and targeted vertebrate and invertebrate fauna surveys throughout WA. Dr Saffer has also assessed flora and vegetation communities and coordinated strategic botanical advice on projects throughout WA.

3.3.2 Licence and Permits

No licences or permits were required for this survey.

3.3.3 Access

The survey area was accessible and all areas were inspected on foot.

3.4 Approach to Survey

Prior to undertaking the field work, investigations into access and preliminary vegetation communities were undertaken. All information in relation to the Bush Forever status was reviewed. All species recorded in the vicinity of the survey, including species of conservation significance, were reviewed. For fauna species of conservation significance that potentially occur in the area, the distributional range, ecology and preferred habitat of each species was researched.

Using the maps of proposed disturbance provided by Paterson Group Architects, the areas proposed to be disturbed were surveyed, in addition to immediately adjacent areas of bushland. Searches were also conducted for secondary evidence of fauna presence at each site including nests, hollows, burrows, tracks, scats and diggings.

Habitat evaluation was undertaken within the survey area included assessing the vegetation strata, rocks and outcroppings, extent of understorey, availability of leaf litter, tree hollows, habitat logs refugia *etc.* The condition of the vegetation was assessed in accordance with Keighery's (1994) condition scale (**Appendix 2**).

3.4.1 Limitations

In accordance with EPA's Guidance Statement No. 56 (EPA, 2004a) and Guidance Statement No. 51 (EPA, 2004b) limitations of the Level 1 survey have been assessed and are presented in **Table 3.1**.

3.5 Results

3.5.1 Desktop Review

3.5.1.1 Flora

A total flora of 293 taxa (species, sub-species and varieties) has been recorded within the Warwick Bushland consisting of 181 native taxa and 112 weed taxa (Brundrett and Clarke 2001). At the time of that survey, three species of conservation significance were recorded:

- *Jacksonia sericea* (Priority 3) (Atkins 2001);
- *Glischrocaryon aureum* was recorded as significant taxa for the Swan Coastal Plain section of the Perth Metropolitan Region (Government of Western Australia 2000); and
- *Ricinocarpus glaucus* was listed as a significant occurrence within the Warwick Bushland (Brundrett and Clarke 2001).

Table 3.1 – Summary of Fauna Survey Limitations

Possible Limitation	Constraint	Comment
Competency/experience of the consultant carrying out the survey	No	Experienced and competent personnel conducted the survey.
Scope	No	All components required for the Level 1 survey were completed in the areas surveyed.
Spatial uncertainty	No	Local infrastructure was established.
Proportion of fauna identified, recorded and/or collected	Yes	A comprehensive vertebrate trapping survey has not been undertaken within the survey area. However, those species recorded during the onsite survey were all positively identified.
Proportion of flora identified, recorded and/or collected	Yes	A comprehensive flora and vegetation survey has not been undertaken within the survey area. However, those species recorded during the onsite survey were all positively identified to genus level.
Sources of information	Yes	A comprehensive vertebrate trapping survey or recent flora and vegetation survey have not been undertaken within the Project area. However, information was available from database searches and unpublished reports.
Proportion of task achieved and further work that may be required	No	Sufficient information was collected for this preliminary assessment.
Timing/weather/season/cycle	No	The survey was completed during daylight hours in temperate weather, both appropriate for this level of survey.
Seasonality	No	Seasonality not impart ant for preliminary environmental assessment.
Disturbances which affected the results of the survey	No	No disturbances affected the results of the survey.
Intensity of survey effort	No	The intensity of the survey is sufficient for the objective of the assessment.
Completeness	No	Proposed survey area was sufficiently surveyed.
Resources	No	Surveyor sufficiently experienced to identify flora to genus level and fauna to species level.
Remoteness and/or access problems	No	Access was not a problem.
Availability of contextual information on the region	Yes	A comprehensive vertebrate trapping survey or recent flora and vegetation survey have not been undertaken within the survey area. Limited regional data is available.
Vegetation mapping reliability	No	No vegetation mapping required for preliminary investigation

3.5.1.2 Fauna

Eleven species of reptile have been recorded in the Warwick Bushland (How *et al.* 1996). While not protected under State or Federal legislation, *Diplodactylus polyophthalmus* Speckled Stone Gecko has been noted because of its rare occurrence on the Swan Coastal Plain (Orsini and Associates 2002). Orsini and Associates (2002) also commented on the breeding of the Brown Goshawk *Accipiter fasciatus* and Red-capped Parrots *Charadrius ruficapillus* within the Warwick Bushland and the presence of the Elegant Parrot *Neophema elegans*, Weebill *Smicrornis brevirostris*, Australian Sitella *Daphoenositta* sp. and Carnaby's Black-cockatoo *Calyptorhynchus latirostris*.

Collectively, a total of 70 bird species have been recorded within the Warwick Bushland (How *et al.* 1996, City of Wanneroo 1995 and K. Clarke *pers. comm.*). At least four species of frogs may have been recorded in the bushland together with the Graceful Sun Moth *Synemon gratioiosa*, Western Jewel Butterfly *Hypochrysops halyaetus* and Sciron Skipper *Trapezites sciron*.

Conservation significant species noted above include:

- Carnaby's Black-cockatoo; Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and Schedule 1 under the *Wildlife Conservation Act 1950* (WC Act); and
- Graceful Sun Moth; Endangered under the EPBC Act and Priority Four on the Department of Parks and Wildlife (DPAW) Threatened and Priority Fauna Database.

See **Appendix 1** for conservation categories and descriptions of conservation status of flora and fauna.

3.5.2 Reconnaissance Survey

Using the map of proposed disturbance as provided by Paterson Group Architects, it was determined that while many of the trees and bushes to the north of the current building including those in the car park are native to Western Australia, most were planted there after the Centre was built. Examples include Marri *Corymbia calophylla*, Jarrah *Eucalyptus marginata* and Grevillea spp.

Similarly, vegetation flanking the western facade of the existing building while native to Western Australia was most likely planted there after the centre was built. Examples include; Jarrah *Melaleuca* spp., *Calothamnus* spp.

Vegetation proposed to be cleared to the south of the existing building comprises the northern boundary of part of the natural bushland of Bush Forever Site No. 202. A pedestrian walkway flanks the building and a 2 metre (m) sandy buffer separates the walkway from the vegetation. In accordance with Keighery's (1994) vegetation condition scale (**Appendix 2**), the condition of the vegetation was considered to be Good to Very Good. While the basic structure of the vegetation community remains intact, the area proposed for disturbance is heavily weed invested and there is evidence of paths that traverse the area and dog prints *Canus lupis familiaris* that suggest dogs do walk adjacent to and within the area. Anecdotal reports indicate that the area is used frequently by bush walkers and domestic dogs (Scott Joy *pers comm.*)

3.5.3 Environmental Assessment

Given the location and extent of the proposed expansion of the established Warwick Leisure Centre, the proposed action is not likely to have a significant impact on a matter of national environmental significance as recognised under the EPBC Act, nor is it likely to have a significant impact on the environment in general or the environment on Commonwealth land. Therefore, it is considered that the proposed expansion for the Warwick Leisure Centre does not warrant referral to DSEWPaC.

However, given that the proposed disturbance will include the clearing of native vegetation, a Clearing Permit under Part V of the Environmental Protection Act 1986 will be required.

Other considerations include:

- minimising the clearing of the bushland to the south of the current building;
- retaining the tennis courts only adjacent to the current building;
- revegetating the area occupying the distal tennis courts further away from the current building;
- revegetating part or all of the swale in the north-east portion of the property; and
- involving the Friends of Warwick Bushland in the planning and revegetating of the above-mentioned areas.

4.0 References

Atkins, K. 2001. *Declared Rare and Priority Flora List for Western Australia*. Department of Conservation and Land Management, Kensington, Western Australia.

Brundrett, M. and Clarke, K. (2001). The Vegetation and Flora of Warwick Bushland. Unpublished report for the City of Joondalup and the Friends of Warwick Bushland. October 2001.

Christidis, L and Boles, W.E. (2008). *Systematics and Taxonomy of Australian Birds*. CSIRO Publishing, Victoria.

City of Wanneroo 1995 Warwick Open Space Management Plan. City of Wanneroo, Parks Department. January 1995

Department of Sustainability, Environment, Water, Population and Communities (DSEWPac). (2013a). *Australia's Bioregions*. Electronic resource accessed 20 July 2013 from Department of Sustainability, Environment, Water, Populations and Communities: <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html>

Department of Sustainability, Environment, Water, Population and Communities (DSEWPac). (2013b). EPBC Act Protected Matters Report. Reports compiled 23 April and 6 June 2013. Commonwealth of Australia, Canberra.

Environmental Protection Authority (2002). *Terrestrial Biological Surveys as an Element of Biodiversity Protection: Positions Statement No. 3*. Environmental Protection Authority, Perth, WA.

Environmental Protection Authority (EPA). (2004a). *Guidance for the Assessment of Environmental Factors. Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia No. 56*. Environmental Protection Authority, Perth, WA.

Environmental Protection Authority (EPA). (2004b). *Guidance for the Assessment of Environmental Factors, Western Australia (in accordance with the Environmental Protection Act 1986) Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia. Guidance Statement No. 51*. Environmental Protection Authority, Western Australia.

Environmental Protection Authority (EPA). and Department of Environment and Conservation (DEC) (2010). *Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. (eds. B.M. Hyder, J. Dell and M.A. Cowan), Perth, Western Australia.

Government of Western Australia (2000). *Bush Forever. Volume 2 Directory of Bush Forever Sites*. State of Western Australia, Perth, Western Australia. December 2000.

Government of Western Australia (2012). 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis. WA Department of Environment and Conservation, Perth.

How, R.A., Cooper, N.K. and Bannister, J.L. (2013). Checklist of the Mammals of Western Australia. Unpublished list available from Western Australian Museum.

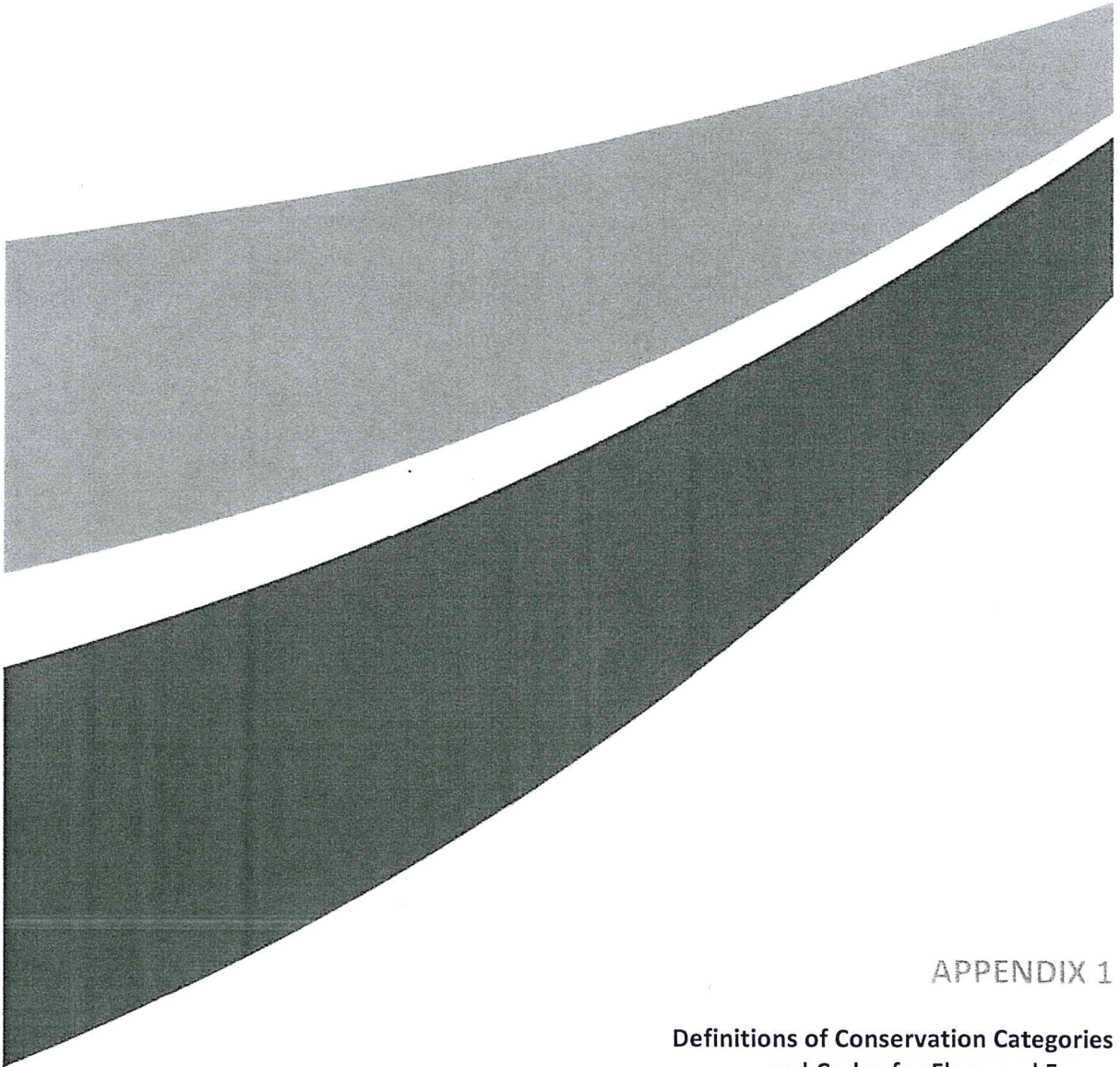
How, R.A., Harvey, M.S., Dell, J. and Waldock, J. (1996). *Ground Fauna of Urban Bushland Remnants in Perth*. Report to the Australian Heritage Commission, Canberra. Australian Capital Territory.

Keighery, B.J. (1994). *Bushland Plant Survey; A guide to plant community survey for the Community*. Wildflower Society of Western Australia (Inc.) Nedlands.

Mitchell, D., Williams, K and Desmond, A. (2002). *Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain Subregion)*. In; *A Biodiversity Audit of Western Australia*. Eds McKenzie, N.L., May, J.E. and McKenna, S. Department of Conservation and Land Management, Perth.

Orsini, J.P and Associates (2002). *Draft: A review of the Management Plan for Warwick Open Space Conservation Area. (Perth, Western Australia.)* Unpublished report, Orsini and Associates, Perth, Western Australia.

Western Australian Herbarium (WAH). (2008). FloraBase - The Western Australian Flora. Accessed January 2013 from: <http://florabase.dec.wa.gov.au/>. Department of Environment and Conservation.



APPENDIX 1

**Definitions of Conservation Categories
and Codes for Flora and Fauna**

Appendix 1 –

Definitions of Conservation Categories and Codes for Flora and Fauna

International Union for Conservation of Nature (IUCN) Red List Categories – Version 3.1 and *Environmental Protection and Biodiversity Conservation Act 1999**

Categories and Codes	Definition
Extinct (EX)	A taxon where there is no reasonable doubt the last individual has died.
Extinct in the Wild (EW)	A taxon where it is known only to survive in captivity, cultivation or as a naturalised population (or populations) well outside the past range.
Critically Endangered (CR)	A taxon that is considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon that is considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon that is considered to be facing a high risk of extinction in the wild.
Near Threatened (NT):	A taxon that is considered close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	A taxon that is considered widespread and abundant.
Data Deficient (DD)	A taxon that has inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.
Not Evaluated (NE)	A taxon that has not yet been evaluated against the criteria

Source: IUCN, 2001 *EPBC Act 1999 is broadly consistent with IUCN red list criteria.

Bilateral Bird Agreements

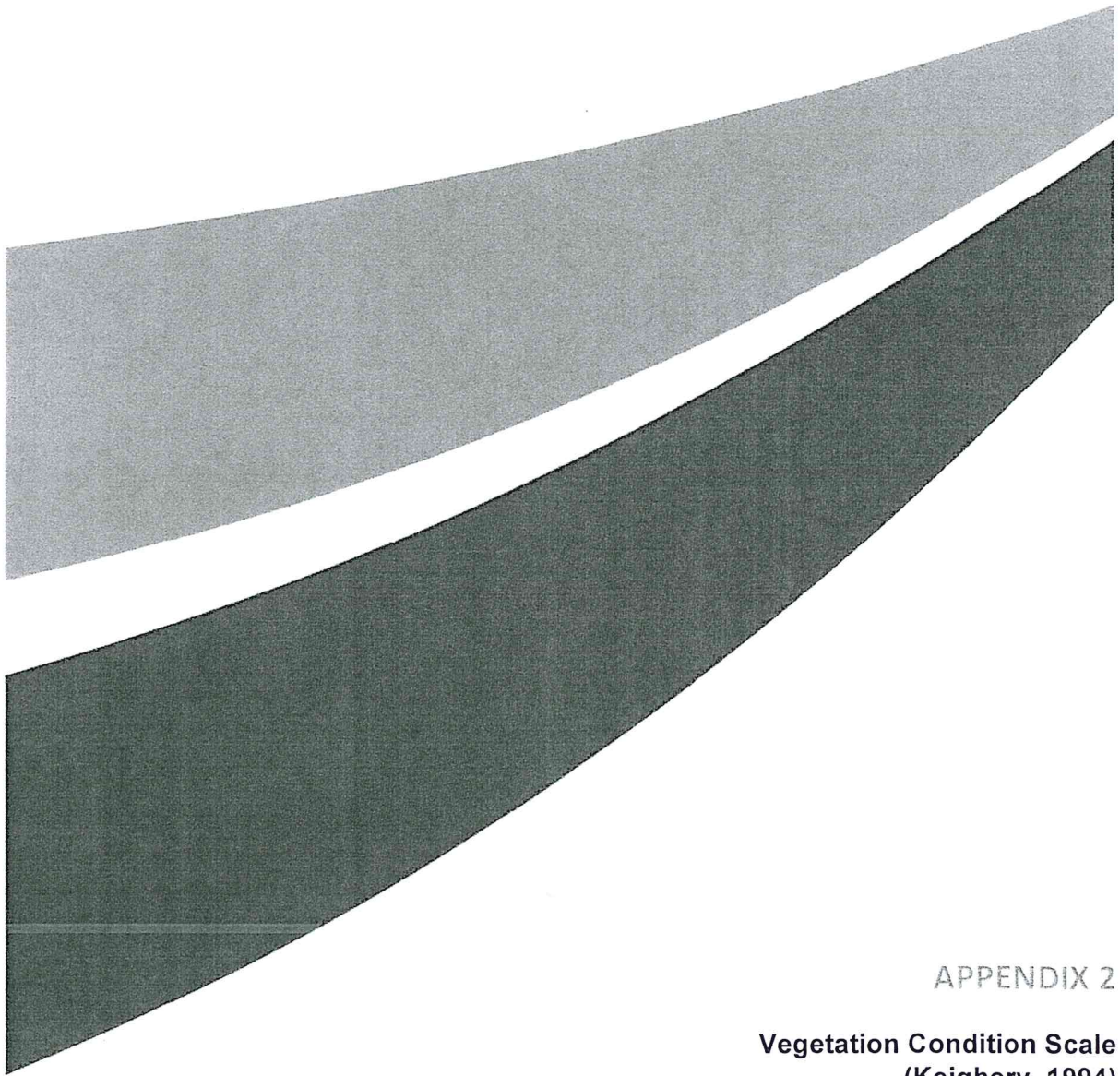
Name	Definition
Japan-Australia Migratory Bird Agreement (JAMBA)	The agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment. Australian Treaty Series 1981 No 6.
China-Australia Migratory Bird Agreement (CAMBA)	The agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment. Australian Treaty Series 1988 No 22.
Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)	The agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds and their Environment. Australian Treaty Series 2007 ATS 24.

Source: SEWPaC, 2012

Definitions of Conservation Categories and Codes for Fauna in Western Australia

Category	Definition
Western Australian <i>Wildlife Conservation Act 1950</i> categories and codes	
Schedule 1 (T): Threatened Fauna (Fauna that is rare or is likely to become extinct)	Taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such. Schedule 1 species are further ranked by DEC according to their level of threat using IUCN Red List categories and criteria: Critically Endangered (CR), Endangered (EN) and Vulnerable (VU).
Schedule 2 (X): Presumed Extinct Fauna	Taxa which have not been collected, or verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
Schedule 3 (IA): Birds protected under an international agreement	Birds that are subject to an agreement between governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction.
Schedule 4 (S): Other specially protected fauna	Fauna that is in need of special protection, otherwise than for the reasons mentioned in the above schedules.
DEC Threatened and Priority Fauna Database categories and codes	
Priority One (P1): Poorly known taxa	Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
Priority Two (P2): Poorly known taxa	Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
Priority Three (P3): Poorly known taxa	Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
Priority Four (P4) Rare, Near Threatened and other taxa in need of monitoring	<p>a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.</p> <p>b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p>c) (c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>
Priority Five (P5): Conservation Dependent	Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

Source: DEC, 2012



APPENDIX 2

**Vegetation Condition Scale
(Keighery, 1994)**

Appendix 2 –

Vegetation Condition Scale (Keighery, 1994)

Pristine (1)	Pristine or nearly so; no obvious signs of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species
Very Good (3)	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good (4)	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded (5)	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded (6)	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as "parkland cleared" with the flora comprising weed or crop species with isolated native trees or shrubs



Perth

PO Box 8177
Subiaco East WA 6008
33 Ventnor Ave, West Perth, 6005

Ph. 08 6260 0700

www.umwelt.com.au

Proposed Expansion of Warwick Leisure Centre

Response of the Friends of Warwick Bushland (FWB) to a presentation by Jim Longbottom, Executive Minister, CCSRA Warwick Leisure Centre on 25th September 2013 re. proposed expansion of the Warwick Leisure Centre. Meeting organised by the City of Joondalup, Mike Smith.

Present: Jim Longbottom – Warwick Leisure Centre
Mike Smith – City of Joondalup
Brain Hadwin, Karen Clarke, David Pike – FWB

1. The FWB appreciate being consulted over this proposed development in the Warwick Open Space Conservation Area, Bush Forever Site 202.
2. A draft consultant's report was provided that advised the proposed expansion did not warrant referral to the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) as it was not likely to have a significant impact on a matter of national environmental significance (UMWELT, July 2013). However, a Clearing Permit under Part V of the state Environmental Protection Act 1986 will be required. As this is a Bush Forever site, the FWB would like to advise that the proposal would also require referral to the relevant agencies implementing the *Bush Forever* conservation plan.
3. While no clearing is the preferred option of the FWB, we understand the need to upgrade the recreational facilities within Warwick Open Space over time as Perth's population increases. We also appreciate that the proponent has already made considerable effort to plan the expansion to minimise impact on the bushland.
4. The FWB appreciate the proposal to return part of the old tennis court area to bushland using restoration techniques. However, we believe this would be a difficult and costly exercise. Resources would be better spent on rehabilitating the existing bushland north and east of the leisure centre and revegetating cleared areas with local native species to create a corridor linking these bushland areas back into the main bushland south of the tennis courts (see Figure 1 attached). It is also possible that the old tennis court area will be required for additional parking or other infrastructure in the future. It would be a tragedy to revegetate the tennis courts and then later want to clear bushland for some other development that could have used this space.
5. The native vegetation in the area proposed for clearing is in a degraded condition based on the standardised vegetation condition scale of Keighery (1994). Historically the area was cleared when the Leisure Centre was built and then it regenerated naturally with a combination of local native species and weeds. At present, the area is dominated by large shrubs of *Jacksonia furcellata* (Grey Stinkwood) with predominantly weeds underneath, although a few *Xanthorrhoea preissii* (Balgas) are present and some small patches of common native orchids (e.g. *Pterostylis sanguinea* (Greenhood orchids), *Diuris magnifica* (Donkey orchids)), with other occasional native herbs and shrubs.
6. *Jacksonia furcellata* is an extremely important native pea species for insect fauna, spiders and birds. The individuals present are close to the

end of their lifespan and will naturally decline over coming years. However, dead material of these plants is also important habitat for insects, small animals and fungi. For example, jewel beetles can hatch from *Jacksonia* up to six years after death of the plant. If a clearing permit were granted the FWB would want to see the cleared native plant material retained on site and spread nearby to retain important habitat.

7. If a clearing permit was granted the restoration plan would need to use appropriate local provenance native species. FWB would like to be consulted if such a plan is developed. If the clearing corridor were marked the FWB could locate the orchids and perhaps other species that may transplant successfully while dormant in summer. The balgas would need to be relocated by a professional, as they require heavy equipment and recovery time in a nursery before replanting. The appropriate licences would be required to take native flora.
8. Please consult with the Department of Fire and Emergency Services to ensure the access and location of hydrants for the proposed expansion are appropriate as the centre is immediately adjacent to bushland and some existing hydrant access would be lost.
9. As Karen Clarke is employed as an Ecologist at the Department of Parks and Wildlife, Swan Region there is potential for a conflict of interest if DPaW assesses the proposal. Therefore, Karen Clarke will declare conflict of interest if the proposal comes to DPaW and ensure she is not involved in the assessment.



Karen Clarke
on behalf of the Friends of Warwick Bushland
18th November 2013.