Appendices

Appendix 1 – Anecdotal evidence of fauna within the city

From www.cbcg.org.au/biodiversity/flora_and_fauna_in_perth_city.htm

Flora and Fauna in Perth city

Have you seen any native animals in the city? Some of our members have.

- I saw five owls, I think Boobook Owls, roosting in the pine tree on the corner of Field and Royal Streets in East Perth. It was the middle of the day (David).
- In winter, the paddock between Trinity College and the causeway sometimes is flooded after rain and the black swans gather there. Two years ago I saw over a hundred swans gathered there on the grass. (Chris)
- There is a pair of Osprey that hunt along the river. I've seen them go past Point Fraser. I think they come from upriver. (Jacqui)
- Pelicans sit on the light poles along the freeway (Colin).
- I was lunching at the museum cafe, in the outdoor courtyard, and I looked up and there was an owl in the tree above me (Julie)
- I was walking along the river early in the morning and I'm sure I saw a native water rat. They have a white tip at the end of the tail. If we could just plant some more sedges and trees along here, I'm sure they would like it (Tim)
- When I cycle home at night along Mounts Bay Road I look for Nankeen Night Heron fishing from the river's edge. In the breeding season the males have a long white feather at the back of the neck that blows around in the breeze (Dudley).
- In Claisebrook channel there are bronze sculptures of turtles. Once there was a group of people looking at the sculpture, then I realised there was a real turtle lying on top of one of the sculptures (Chris).
- We often see dolphins in the river near Point Fraser (Jacqui).

Others have seen feral animals

- I've seen foxes on Mounts Bay Road, late at night and once I saw one near the cathedral, early on a Sunday morning (Jane).
- The 28 parrots used to nest in the palm trees in Queens gardens but these days you are more likely to see Rainbow Lorikeets (David).
- Some ducklings had been killed at Point Fraser and someone said they could smell that foxes had been there (Rada).

Have you seen native or feral animals in Perth city? Please contact us and tell us your stories.

A pelican enjoys the view from the top of a light.

Dolphins in the river between Point Fraser and Heirisson Island.

A darter *Anhinga melanogaster* dries its wings in the sun.

Black swan on sandy beach in Mounts Bay.

Appendix 2 – Cultural use of native flora and fauna

For full list see www.cbcg.org.au/biodiversity/flora_and_fauna_in_city_art.htm

Flora and Fauna in city art and architecture

Native plants and animals have been used to decorate items from ball gowns to city buildings. Here are some of our favourites in the city of Perth.

This kangaroo is in the stained glass window above the entrance of the Young Australia League (YAL) building on Murray St, Perth.

Swans have been used as decoration on buildings, on bridges. Here is a particularly nice one on the front of 57 Murray St, Perth.

The Perth Mint, which was built in 1896, has banksia nuts in the decorative frieze around the outside of the building.

The entrance to the WA Club on St George's Terrace

Swans, pelicans and cockatoos decorate the upper walls of Gleddon Arcade (corner Hay and William Streets, Perth). (Above) The University of Western Australia commissioned paintings with flora, fauna, fish and birdlife characteristic of Western Australia. The nankeen night herons (above right) can be seen today fishing from the river's edge along Mounts Bay Road at night.

Banksia gate at the Chinese Consulate in East Perth. Artist Kevin Draper.

One of many Black Swans decorating Parliament House.

Cast iron swans decorate the Horseshoe bridge, built in 1903. The nearby Barrack St bridge, constructed in 1894 is also decorated with less elaborate black swans.

This china ornament celebrated Perth's Centenary in 1929.

The black swan reigns supreme on souvenirs with a "Perth" theme. Kangaroo means Australia, but the Black Swan means Perth

Native flora and fauna in the logos and emblems of city organisations, clubs, schools and businesses.

Appendix 3 – Literature Review

Report name	Year	Agency	Comments
Strategic Documents			
"*A Strategic Plan for Perth's Greenways*" Tingay and Associates	1997	WAPC (lead agency)	• Identifies potential Greenway links along river foreshore (#24), Mitchell Freeway(#10), Midland railway reserve and branch of East Parade into East Perth(#28). • City of Perth considered the report on 23 March 1999. Recommended preparation of a masterplan for City's open spaces.
Western Suburbs Greening Plan	2002	WESROC	• Plan identified two links which ideally would be continued into the City of Perth • From Matilda Bay along the river foreshore • Along Perth-Fremantle railway reserve
Vincent Habitat Project: Technical Report	2004	Town of Vincent	• Plan primarily recommends east-west linkages to connect Lake Monger to parks within Vincent. • Potential to deliver gardening workshops and information to residents in both Vincent and Perth as similar inner city character.
Foreshore Management Strategy	2007 (Draft)	Swan River Trust	• Draft Foreshore Management Strategy released for public comment in late 2007. • The Strategy identifies the condition of the foreshore, makes recommendations and identifies priority areas for funding. • Intended to guide expenditure of *Riverbank* funding • Priority given to unstable/eroded foreshores and areas with remnant vegetation • Does not recognise opportunities to restore indigenous vegetation (as has been achieved at Point Fraser)
Strategic Plan 2004-2008	2004	City of Perth	• The Strategic Plan adopted by the City recognizes the city's natural assets, particularly Kings Park and the Swan River and recognizes that there are a number of environmental problems facing the city. • The plan affirms that "sustaining and protecting the natural environment is eddential to maintinaing Perth's charm and character". • The plan states that "The City is committed to the responsible conservation of Perth's spectacular natural environment."
City Environment Plan 2005-2008	2005	City of Perth	• The Environment plan lists Biodiversity as one of five Issues to address. • Point Fraser is recognized as a success • Actions include re-eastablishing native fringing vegetation on areas of the foreshore, assessing the feasibility of improving biodiversity on Heirisson Island and identify for surther opportunities. • Other actions can also support biodiversity including environmental water quality improvements (Water), minimizing land erosion and avoiding the development of acidic conditions in acid-sulphate soils (Land).

Report name	Year	Agency	Comments
City Planning Scheme No.2	2004		• The planning scheme recognizes the landscape values within the city and seeks to protect existing open space and landscaped setbacks. • P5 Citiplace Precinct "*The area north of Wellington Street will continue to accommodate major public transport and ancillary facilities. Development in this area is to be of a public nature and set in landscaped surrounds which will augment the landscaped railway corridor along the northern edge of the Precinct.*" • P8 Foreshore Precinct "*Proposed buildings and structures must preserve the parkland open space character of the foreshore while reinforcing the development node of Barrack Square*" • P9 Matilda Bay Precinct "*Multiple units, set within spacious, planted gardens will continue to be the predominant form of housing, although all forms of housing are permitted." And "New development must complement existing structures, the escarpment, Kings Park and the river foreshore, by way of design, materials used and landscaped setting.*" • P10 West Perth Precinct "*It is envisaged that this Precinct will continue to develop as a living and working environment set in spacious landscaped surrounds, reflecting the original concept for this area of a garden office/residential district."* • P12 Langley Precinct "*Passive recreational opportunities in the Precinct should be expanded, and better integrated with surrounding spaces, to take full advantage of this picturesque river bank and parkland setting in close proximity to the city centre. At the regional scale the image of the Swan River foreshore will predominantly one of parkland open space as part of an extensive, linked metropolitan parkland foreshore system*." • P15 EPRA (East Perth)
Public Places Enhancement Strategy	1997 under review	City of Perth	• Document being drafted and not available to view.
Foreshore Action Plan	1999		• Broad principles include maintain public access along foreshore; better connection between city and river; break up linear form of foreshore; maintain open character; maintain Langley Park as large grassed open space. • Actions include linking Concert Hall to river, further activity nodes at Plain St, Victoria Ave and Mounts Bay, improve boat access, enhance pedestrian environment, develop Point Fraser as a major visitor node. • Plan does not specifically recognize natural values of the foreshore.
Central Perth Foreshore Study	1985		• "The Foreshore landscape of the central city is one of the most important features on the river system and provides central Perth with a unique image and amenity." • the strategy acknowledged '…the supreme importance of the river and parkland foreshores setting of the city. In the grandest sense the foreshore is the city's front garden...' • The stated aim of the strategy was to 'foster greater recreational use' of the foreshore areas through the provision of a wide range of attractive and functional spaces.

Report name	Year	Agency	Comments
Community Safety and Crime Prevention Implementation Plan 2006-09	2006	City of Perth	• No recommendations which affect landscaping
DRAFT Landscape Strategy (not adopted)	1995	City of Perth	• Recommendations re landscaping, esp tree planting in streets and public open space • Fundamental principles include "create a predominantly Western Australian character" p9 • Discusses "strategic green corridors" p28 along railway and freeway reserves, Narrows Interchange p29, and Bunning lake p51 • Recommendations include non-local and Eastern State species
Landscape Improvements at the Narrows Interchange: Master Plan Review	? between 1996 & 2001	Main Roads	• Reviews Master Plan for Narrows Interchange • Suggests move towards indigenous vegetation for landscaping • Except around ornamental western lake
Policy Documents			
Policy 15.2 PROTECTION AND ENHANCEMENT OF OPEN SPACE	2005	City of Perth	Policy states the City will aim to:- • ensure that all of the public open space within the city is retained. • prevent intrusion into parks and open space as a result of private or public development, new roads and car parks. • prevent net loss of parks and open space by ensuring that any unavoidable loss is replaced by the equivalent in another location. • secure new public open space where appropriate. • protect and maximise public access to parkland. • ensure that open space is designed, developed and landscaped in accordance with any relevant guidelines adopted by the Council.
Safer Design Guidelines Stage 5 and Designing Out Crime Planning Guidelines		City of Perth, Office of Crime Prevention and WAPC	• Guidelines for landscaping to maintain sightlines, increase surveillance and reduce crime. • Appropriate selection of plants can meet the guidelines.
Assessments/Data/Surveys			
Bringing Back the Swans: The potential to encourage more Black Swans onto the Swan River	2000	ATA, Rogers and Bamford for WRC	• Explains critical habitat requirements and • Assesses places for creating habitat on the river including Narrows/Barrack St; Heirisson Is and Claisebrook
Precinct 6 – Landscape Description	1997	Swan River Trust	• Description of the hydrology, topography and vegetation of the Perth basin; history; significant sites and comments on landuse, form, values. • Includes a "Personal View" of an unidentified author • Good clear maps

Report name	Year	Agency	Comments
Precinct 8 Landscape Description	1997	Swan River Trust	• Description of the river from Heirisson Is upstream, history, landscape values • Good maps
Foreshore Vegetation Asssessment	2007	Swan River Trust	• Assessment of foreshore vegetation and condition by the Swan River Trust.
Bird surveys in selected Perth metropolitan reserves: Round 3 survey report. C.A. Gole	May 2006	Birds Australia	• Report on surveys undertaken by volunteers across Perth in 2005-2006 including Point Fraser. • 30 species observed at point Fraser with low numbers however construction was occurring on adjacent site. • Two species of conservation significance were recorded: Musk Duck (a single individual recorded once) and Common Sandpiper. The Common Sandpiper, a species protected under JAMBA/CAMBA1 international treaties, appeared to be resident at the site over the southern hemisphere non-breeding season. • Breeding was confirmed for three species: Pacific Black Duck, a species common in landscaped and natural wetlands on the Swan Coastal Plain; Black-fronted Dotterel, a small non-migratory wader; and Welcome Swallow, an aerial feeder that commonly utilises built spaces for breeding. At Point Fraser, it was recorded nesting beneath one of the boardwalks. • Buff-banded Rail, the most commonly recorded of the crakes and rails in the Perth Metropolitan Area, was recorded on two occasions. • Non water-dependent species recorded using Point Fraser are generalist species common in urban parks and gardens.
Fauna Use and Water Quality Measures in Six Compensation Basins. Eddy Cannella	September 1997	Main Roads	• Fauna use and water quality was assessed at six Main Roads compensation basins including two basins at the Hamilton Interchange • 38 birds species and 1 reptile were observed during a 12 month period. • Two species of birds significant, Rainbow Bee-eater and Great Egret listed under the CAMBA and JAMBA international treaties for migrating birds. • Dusky moorhen is a priority species (listed by CALM) • Rainbow bee-eaters nesting in banks. • Water quality generally poor with some high results for heavy metals in sediment, discoloration and signs of botulism affecting ducks.

Appendix 4 – Sites registered by the Department of Indigenous Affairs

Status:	I	Interim	Access	C	Closed	Restriction	N No restriction
	P	Permanent		O	Open		M Male access only
	S	Stored Data		V	Vulnerable		F Female access only

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Coordinates	Site No	Comment
3408	I	O	N	East Perth: Bennett House.		Camp, [Other: RESERVE]	393599mE 6464233mN Zone 50 [Reliable]	S02793	
3536	P	O	N	Swan River	Mythological		443400mE 6461957mN Zone 50 [Reliable]	S02548	
3584	S	O	N	Dyeedyallalup.		Ochre, Camp, Water Source, [Other: ?]	393175mE 6463434mN Zone 50 [Reliable]	S02410	Near former ABC studios. On proposed ENRICH walk trail
3586	S	O	N	Perth Gazette.		Camp	392047mE 6464088mN Zone 50 [Unreliable]	S02412	
3587	S	O	N	Barracks Arch.		Camp	391219mE 6464289mN Zone 50 [Unreliable]	S02413	
3589	P	O	N	Heirisson Island.	Mythological	Meeting Place, Plant Resource, Camp, Hunting Place	394357mE 6462806mN Zone 50 [Reliable]	S02415	Eastern end of ENRICH Walk Trail
3593	P	C	N	Gudinup	Ceremonial		Not available for closed sites	S02419	
3694	P	O	N	Claisebrook Camp.		Camp, Water Source	394307mE 6464315mN Zone 50 [Reliable]	S02256	
3697	S	O	N	Haig Park.		Camp, [Other: ?]	394060mE 6464145mN Zone 50 [Reliable]	S02259	

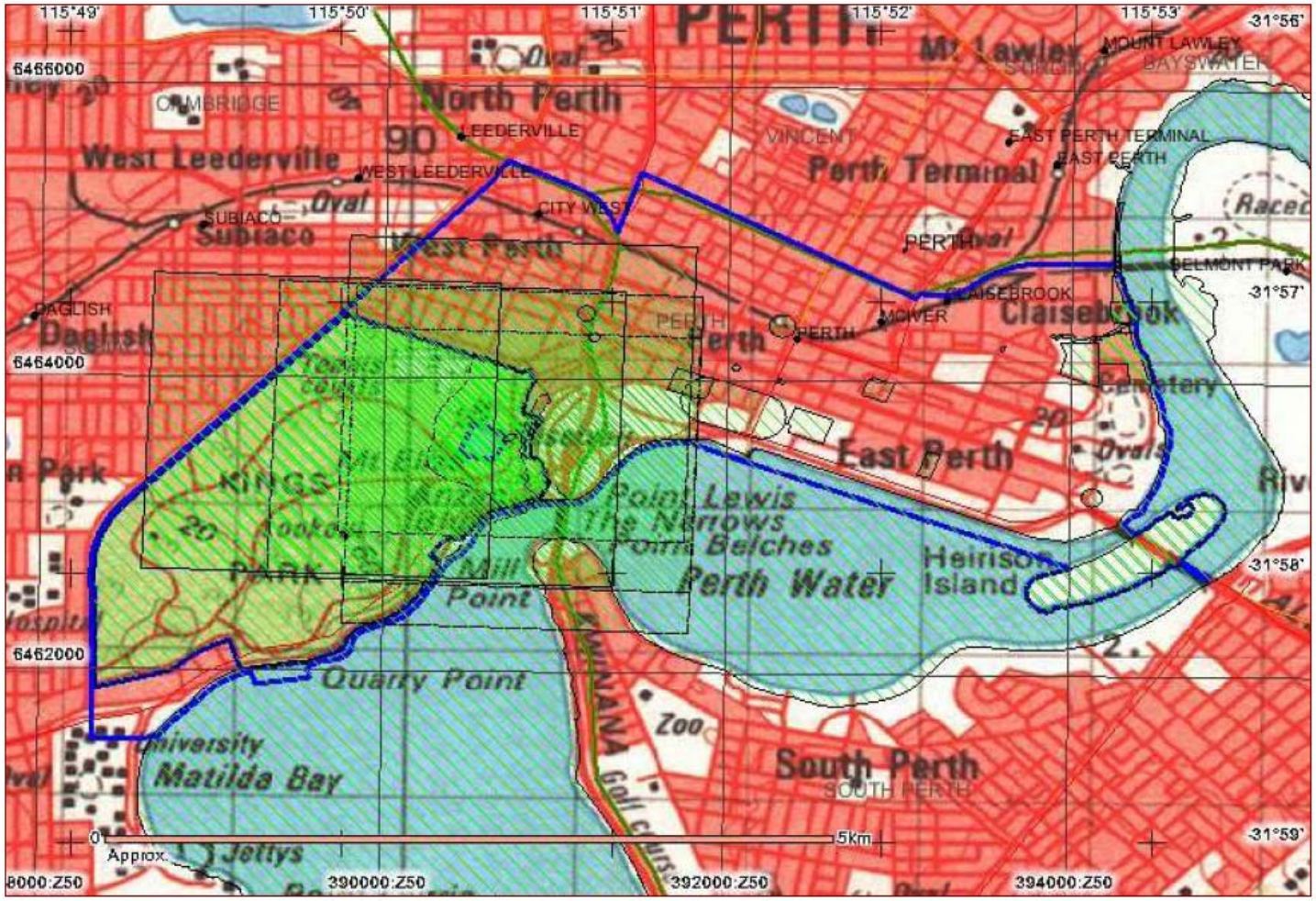
3702	S	O	N	Esplanade.		Camp, Hunting Place	392034mE 6463812mN Zone 50 [Unreliable]	S02202
3703	P	C	N	Spring Street		Camp, Named Place, Water Source	Not available for closed sites	S02203
3704	P	C	N	Kings Park Waugal.	Ceremonial, Mythological	Plant Resource, Water Source	Not available for closed sites	S02204
3737	S	O	N	Perth Central Railway Stn.	Mythological	Hunting Place	392314mE 6464374mN Zone 50 [Unreliable]	S02184
3754	P	O	N	Mt Eliza Waugal	Mythological		390599mE 6463641mN Zone 50 [Reliable]	S02144
3761	P	O	N	Kings Park.	Ceremonial	Hunting Place	390883mE 6463548mN Zone 50 [Reliable]	S02154
3765	S	O	N	George & Hay Streets.		Camp	391171mE 6464449mN Zone 50 [Unreliable]	S02158
3767	P	O	N	East Perth Power Station.		Meeting Place, Camp, [Other: ?]	394266mE 6465018mN Zone 50 [Reliable]	S02160
3787	P	C	N	Mounts Bay Road.	Mythological	Camp, Named Place, Water Source	Not available for closed sites	S02126
3789	P	O	N	Perth Town Hall.		Camp	392311mE 6463996mN Zone 50 [Reliable]	S02128

3790	S	O	N	Perth Technical College.		Camp, Water Source	391784mE 6463978mN Zone 50 [Reliable]	S02129
3798	P	O	N	Government House.	Skeletal material/Burial	Camp, Water Source	392483mE 6463698mN Zone 50 [Unreliable]	S02137
3800	S	O	N	Kings Park.	Skeletal material/Burial	Named Place, Water Source	390731mE 6463597mN Zone 50 [Reliable]	S02139
18936	S	O	N	Kings Park	Ceremonial, Mythological, Historical		389637mE 6463150mN Zone 50 [Reliable]	
19863	I	C	N	King'S Park Women'S Site	Mythological	Natural Feature	Not available for closed sites	
21409	S	O	N	Point Lewis Roundabout			390982mE 6463232mN Zone 50 [Unreliable]	
21440	S	O	N	Mounts Bay River Walling			390713mE 6463082mN Zone 50 [Reliable]	
21535	S	O	N	East Bridge Precinct		Camp	394262mE 6464820mN Zone 50 [Reliable]	
21536	S	O	N	Trafalgar Precinct		Camp	394314mE 6464253mN Zone 50 [Reliable]	
21621	P	O	N	Kilang Minangaldjkba		Water Source	394127mE 6463219mN Zone 50 [Reliable]	

Department of Indigenous Affairs
Government of Western Australia

Aboriginal Heritage Inquiry System
Register of Aboriginal Sites

DEPARTMENT OF INDIGENOUS AFFAIRS



Appendix 5 – Indigenous culture within the city

Lotterywest Festival Overture 2006

Directed by Rhoda Roberts

A powerful evening merging ancient tradition and contemporary images, ceremony and music in a special free outdoor celebration with performances directed by Rhoda Roberts (Sydney Olympics Opening Ceremony, Dreaming Festival). A historic artwork title Ngallak Koort Boodja (Our Heart Land) has been created to celebrate Noongar culture. Join us for this extraordinary opportunity to be part of this significant cultural exchange. All are welcome to share our journey through Kings Park to launch the 2006 Festival's special focus on Noongar culture.

4pm, ENRICH Swan River Foreshore Walk Trail
Walk together with us from Matagarup (Heirisson Island) to reignite the flame of Noongar culture at Gargatup (Kings Park). Along the way you will view sites of significant Noongar places. A balga (grass tree) will be ignited at each site and watched in silence.
3.30pm Gather at Matagarup (Heirisson Island) Bring a hat, sunscreen and comfortable shoes. Maps and information will be provided. Finish at Kings Park in time for the Welcome to Country.

6.30pm, Welcome to Country
Wandju Wandju Nidja Noongar Boodja
Noongar Boodja is alive!
Representatives from the 14 clans of the Noongar Nation come together to welcome and share Noongar culture in this historic event.
The Welcome to Country is a significant ceremony to lay a strong foundation and safe passage for the whole community during the Festival.
Pioneer Women's Memorial
Kings Park & Botanic Garden

7.30pm Unveiling Ngallak Koort Boodja Canvas
Our Heart Land Canvas
Ngallak Koort Boodja as part of the Lotterywest Festival Overture is proudly presented by Respect Yourself, Respect your culture.
Created over three years the Ngallak Koort Boodja Canvas is a 10 x 8 metre painting telling the stories of the six Noongar seasons and the Noongar Nation relationship to Boodja (Country). Created by six Noongar artists chosen by the united Elders and famlies from across the Noongar Nation.
Hundreds of dancers will perform with the Garrabarra Dance Company to celebrate the canvas. Directed by Rhoda Roberts and featuring singer Emma Donovan.
Ngallak Koort Boodja artists: Lance Chadd, Shane Pickett, Troy Bennell, Yvonne Kickett, Alice Warrell and Sharyn Egan.

www.perthfestival.com.au/2006_archive/html/101419.html

BIRUK YEEDEE MOODITJ DREAMING FESTIVAL

Meaning: Summer songs, good dreaming festival

The Biruk Yeedee Mooditj Dreaming Festival will be held for the first time at the Supreme Court Gardens. The festival is a celebration of traditional and contemporary Indigenous culture. Music performances will showcase local and regional bands and will feature George Rrurrambu with Birdwave (Darwin) and
international guest artist Sahra Indio (Hawaii). Other entertainment includes Indigenous dance performances and fashion parades.

The Coolunga Up area will provide activities for children and the Yungar Up area will feature displays such as reptiles and Indigenous arts and crafts.

The festival is a family-focused event and is alcohol-free; bring a hat and rug instead. 1pm until 8.30pm.

www.perth.wa.gov.au/skyworks/userguide.html

Appendix 6 – Sites on the State Heritage List

Site name	Heritage List	Comments	Conservation Plans etc (Heritage Council Library Reference #)
Bishop's House	Permanent	"*surrounded by lawns and gardens, the place is aesthetically pleasing and provides a visual oasis*"	4323 Bishop's See Conservation Plan Vol 2 1999 4322 Bishop's See Conservation Plan Vol 1 1999
East Perth Cemetery & Pioneer Park	Cemetery – Interim Listed	Statement of Significance doesn't mention the landscaping.	942 East Perth cemetery landscape conservation study : the East Perth study 1991 Western Australia 888 The East Perth Cemeteries Conservation Plan 1992
Government House Grounds (not surveyed)	Interim	"*The House, Ballroom and Gardens present as one place of aesthetic significance - a large house in a garden setting*."	884 Government House Grounds Conservation Plan 1995 1527 Conservation Plan Government House Grounds Stage 3 Management Plan Dec 1996 4108 Government House Grounds Masterplan Study 1999
Harold Boas Gardens	Permanent	"*the place is an important example of creative landscape design, significant for its innovation and achievement in the 1970s, which introduced a number of new species into public gardens in this State, some among them being among the first such use in public gardens in Australia, and some, specifically for this project, being propagated for the first time from seed or cuttings of indigenous plants collected in various regions of Australia;"*	A Fairer Athens and a freer Rome

Site name	Heritage List	Comments	Conservation Plans etc (Heritage Council Library Reference #)
Narrows Interchange including foreshore between Barrack Square and Narrows Bridge	MHI	John Oldham Park (west of freeway) and David Carr Memorial Park (east of freeway) "*Narrows Interchange Park is a designed landscape built to enhance the Narrows Bridge and Mitchell Freeway interchange. It is one of a number of important green spaces adjoining the Swan River foreshore that provide a sense of arrival to the City of Perth. These include the Causeway and Heirisson Island landscape, Langley Park, Supreme Court Gardens, The Esplanade, Mounts Bay Road Plane Tree plantings, and the backdrop of Kings Park and Mt. Eliza in particular. The design and style of these spaces is diverse. However, collectively these spaces form a green forecourt to the City and the Narrows Interchange Park plays an integral role in this important system*"	
Old Observatory Grounds and Dumas House	Dumas House – Permanent Old Observatory – Permanent	Statement of Significance doesn't mention the landscaping. Note: Includes Solidarity Park which is listed.	1863 Conservation Study for the old Observatory 1991
Parliament House Grounds	Interim	"*The mature trees, which are remnants of the earliest plantings, have historic and aesthetic value because of their age, landmark qualities*"	7713 Parliament House conservation plan (draft) 1994
Queens Gardens	Permanent	"*rare example with a high degree of integrity of the Picturesque and Paradise garden styles*."	4708 Queen's Gardens Perth: Conservation plan 1998 7153 Planting the nation (Book)
Russell Square	MHI		

Site name	Heritage List	Comments	Conservation Plans etc (Heritage Council Library Reference #)
Stirling Gardens, Council House gardens and Supreme Court Gardens	Stirling and Supreme Court Gardens - Permanent	"*tall perimeter planting of the Supreme Court Gardens and the rich tree canopy of Stirling Gardens contribute to and are integral with the streetscape of Riverside Drive, and form an integral part of the avenue of Moreton Bay Figs which line and enclose Barrack Street between the Esplanade and Riverside Drive;*"	3678 Supreme Court and Gardens-Conservation Plan 1998 4105 Stirling Gardens Perth: Conservation Plan 1997 1363 Conservation Plan for the Supreme Court Precinct Perth 1993
The Esplanade (not surveyed)	Permanent	"*the place has considerable historic value as part of major reclamation work commenced in the 1880s along the Swan River foreshore to create a network of public open spaces and river amenities aimed at integrating the city environment with the river;*"	1837 Central Perth foreshore study (draft final report) 1987 4301 Central Perth foreshore study (interim report) 1985 7814 A fairer Athens and a freer Rome: historic public gardens in Perth, WA 1982 6792 Esplanade Reserve, Perth city foreshore: conservation plan 2004

Appendix 7 – Vegetation description – Seddon & Ravine

George Seddon and David Ravine. A City and its Setting: Images of Perth, Western Australia 1986 Fremantle Arts Centre Press, pp76-81

"Ridge, Swamp and Mount

What did the site of Perth and its setting look like when Mrs Dance cut down her tree in the founding ceremony of 12 August 1829? An image of its pristine state can be constructed today only by stripping away a mass of later accretions.

The site was a well-timbered, low and narrow sand-ridge running east- south-east from Mt Eliza. … The river extended much further north than it does now, and further than most people realise - successive filling has extended the shoreline up to half a kilometre to the south. The Old Court-house, which still stands in the Stirling Gardens, was built, in 1836, almost at the water's edge. Immediately behind it were the buildings of the Water Police, wooden boat-sheds which projected over the water (see Fig. 7:20). These sheds were demolished and the river reclaimed in 1903 to provide a site for the Supreme Court and Gardens. …

The river margins were very shallow and edged with rush beds, which were put to use in early buildings. The first little Anglican church, on Hay Street (then called Howick) near Irwin Street, was known as the 'Rush Church', walled with rushes over a timber frame. The common bottom-rooted plants growing in shallow water were the club-rush (*Schoenoplectus validus*), the twig-rush (*Baumea articulata*) and the shore-rush (*Juncus krausii*). These rushes formed dense clumps in shallow fresh or brackish water; the twig-rush has jointed cylindrical leaves rather like a bamboo, and it grows taller than a man.

There is a remarkable early photograph taken by Alfred Hawes Stone (1801-73), an enthusiastic amateur photographer of the 1860s, showing a boat in front of just such a tall stand of twig-rush on Perth foreshore (Fig. 5:2). Club-rush, which is generally around 1.5 metres, grows along the banks of the river today in a few 'unimproved' stretches at Belmont. Swamp paperbark (*Melaleuca rhaphiophyilla*) shows in the background of many photographs taken by Stone in the 1860s, particularly along the Perth foreshore beneath Mt Eliza, near Government House Jetty, at Claise Brook, in Lake Henderson and on the flats around Heirisson Islands.

Salt-marsh was also common on the Heirisson Island flats, as well as on the Perth foreshore and at Mill Point. *Sarcocornia quinqueflora*, *Suaeda australis* and *Samolus repens* were the common salt-marsh plants, with *S. quinqueflora* as the most dominant species. Common sword sedge (*Lepidosperma longitudinale*) and the knotted club-rush (*lsolepis nodosa*) lined the banks and backed the sandy beaches. The flooded gum (*Eucalyptus rudis*) graced the alluvial flats and is also shown on higher ground in some of Stone's photographs. These trees were not as sturdy as those mature specimens closer to the water level, which is their usual habitat. These low-lying mature specimens may have provided seed stock for the higher ground.

The 1860s photographs of Stone also reveal many of the mature flooded gums in a state of ill-health. This may have been a result of rising salinity from clearing and drawing of fresh water from the wells dotted all over the Perth town site. There are still specimens of *E. rudis* as far down river as Crawley, although they are now showing signs of age.

The river-oak, *Casuarina obesa,* together with *Melaleuca hamulosa,* may also have occurred on the low ground, giving way to jarrah (*Eucalyptus marginata*) and marri (*E. calophylla*) on the sandy rise. *Melaleuca preissiana* was visible in the low-lying freshwater swamp north of the Perth Hospital. …

The jarrah were big trees, from all accounts. Dr T.B. Wilson, a naval ship's surgeon, visited the site in the spring of 1829, and found the intended St Georges Terrace to be 'adorned with lofty trees, and a variety of lovely flowers . . .Perth, the embryo capital.. . has . . . the appearance of a straggling tented

field'. Some of the original jarrah can be seen in views of the township for many years. The trees were hard to fell, and if Mrs Dance was assigned a jarrah, as appears to be the case in the well-known pictorial reconstruction by Pitt-Morison, it is surprising that the ceremony was concluded within the day. (A casket in the Western Australian Museum supposedly made from the wood of the ceremonial tree is that of *Casuarina fraseriana,* the casket being presented by Queen Mary, who was Queen Mother at the time. In any case, Mrs Dance would have struck only a ceremonial blow. A sailor would have done the work.)

Banksia menziesii and *Casuarina fraseriana* would have been the common understorey trees. One photograph of Stone's shows a healthy specimen of *Nuytsia floribunda* (Christmas tree) growing on the north-west corner of St Georges Terrace and Victoria Avenue, and another shows a stand of Swan River cypress *(Callitris preissii)* near the corner of Hay and Irwin Streets (Fig. 11:77).The zamia palm *(Macrozamia riedlei*) and the blackboy *(Xanthorrhoea* preissii*)* are easily identifiable in a painting by A. Taylor in 1850, entitled 'From Croft's House in St Georges Terrace Looking Across to Mt Eliza', although most of the blackboys would have disappeared in the first twenty years, as the leaves were a source of thatch, and the trunk of kindling for fire-lighting. Other species identifiable in the Stone collection include *Banksia grandis, Lepyroidia* sp.(male and female plants), *Asterareae* (everlastings), *Hakea prostrata* and *Patersonia umbrosa* (sword grass).

Acaria saligna (Port Jackson wattle) was frequently seen growing on cleared vacant land, which is not surprising in view of its ability to thrive in disturbed soils. *Patersonia, Jacksonia* and *Lepidosperma* species and jarrah lignotubers are other indigenous plants that appeared to tolerate regular soil disturbances. In contrast, a remnant of *Agonis linearifolia* can be identified on the bank of Clause's Brook (Fig. 5:3), a relatively undisturbed area in the 1860s. This species should have been common in the jarrah-banksia woodland of the Perth town site, but it is very sensitive to disturbance and is known to disappear early with environmental change. *Anigoranthos manglesii* (kangaroo paw) appears to have been cultivated quite early: prominent clumps of these flowers are captured by Stone's camera in the gardens of Mona Cottage (Irwin Street), and of Government House.

Mt Eliza and the area that now constitutes Kings Park were a dominating element in the setting. … Where plants could get a foothold, there would have been the velvet green of Swan River cypress and peppermints at the base in the little coves.

Tuart *(Eucalyptus gomphocephala)* crowned the higher ground where the limestone was near the surface, but jarrah and marri were the dominant trees of the Park. … The blackboys were harvested for a variety of purposes, including the generation of gas for lighting:

> *The shop of Mr. T.S. Mitchell has for some evenings past been illuminated with gas, procured from the resin of the blackboy. It answers very well and, we have no doubt, will be generally adopted from economical motives.*

… On the current vegetation map of the Perth region, Perth, Kings Park and South Perth are all shown as *'Karrakatta Central and South:* predominantly open forest of tuart-jarrah-marri and woodland of iarrah-banksia."

Appendix 8 – Fauna observed during field surveys

Group	Common name	Latin name	Observed/ Inferred	Significance	Comments
Swans	Black Swan	*Cygnus atratus*	✓		On beach in Mounts Bay, Queens Gardens, during winter on flooded paddocks
Ducks	Musk Duck	*Biziura lobata*	✓	3	Significant
	Wood Duck	*Chenonetta jubata*	✓		
	Grey Teal	*Anas gracilis*	?		Surveys record 'Teal'
	Australian Shelduck	*Tadorna tadornoides*	✓		
	Hardhead	*Aythya australis*	✓	3	Significant
	Pacific Black Duck	*Anas superciliosa*	✓		
Grebes	Australasian Greve	*Tachybaptus novaehollandiae*	✓		
Darters/Cormorants	Darter	*Anhinga melanogaster*	✓		
	Little Pied cormorant	*Phalacrocorax melanoleucos*	✓		
	Pied cormorant	*Phalacrocorax varius*	✓		
Pelicans	Australian Pelican	*Pelecanus conspicillatus*	✓		
Egrets	Great Egret	*Ardea alba*	✓		
	Little egret	*Ardea (Egretta) garzetta*	?		
Herons	White-faced heron	*Ardea novaehollandiae*	✓		
	Rufous (Nankeen) night heron	*Nycticorax caledonicus*	✓	4	Significant
Spoonbills, Ibises	Yellow-billed Spoonbill	*Platalea flavipes*	?		
	Australian White Ibis	*Threskiornis molucca*	✓		
Hawks	Osprey	*Pandion haliaetus*	✓		Fishing up and down river around Point Fraser and East Perth
	Hawk	*Unknown*			
	Falcon	*Unknown*			
Native hens	Dusky Moorhen	*Gallinula tenebrosa*	✓		
	Purple Swamphen	*Porphyrio porphyrio*	✓		
	Eurasian Coot	*Fulica atra*	✓		
	Buff-banded Rail	*Gallirallus philippensis*	?		Surveys record 'Rail'
Oystercatchers	Pied Oystercatcher	*Haematopus longirostris*	✓		On flooded grass Trinity Reserve (photo 30/06/07)
Gulls	Silver Gull	*Larus novaehollandiae*	✓		
Terns	Caspian Tern	*Sterna caspia*	✓		
Doves	Spotted Turtle-dove	*Streptopelia chinensis*	✓		Introduced
	Laughing Turtle-dove	*Streptopelia senegakensis*	✓		Introduced
Cockatoos	Short-billed Black Cockatoo (Carnaby's)	*Calyptorhynchus latirostris*	✓	1,4, E, R1	**Endangered**
	Galah	*Cacatua roseicapilla*	✓		
Parrots	Australian Ringneck	*Barnardius zonarius*	✓		
Owls	Southern Boobook	*Ninox novaeseelandiae*	✓		
	Owl	*Unknown*			
Kingfishers	Laughing Kookaburra	*Dacelo novaeguineae*	✓		Introduced
	Rainbow Bee-eater	*Merops ornatus*			Observed E Canella 1997 Hamilton Interchange
Pardalotes	Pardalote	*Unknown*			Surveys records 'Pardalote'
Honeyeaters	Red Wattlebird	*Anthochaera carunculata*	✓		
	Little Wattlebird	*Anthochaera chrysoptera*	✓		
	Singing Honeyeater	*Lichenostomus virescens*	✓		
	Brown Honeyeater	*Lichmera indistincta*	✓		
	New Holland Honeyeater	*Phylidonyris novaehollandiae*	✓	4	Significant
	White-cheeked Honeyeater	*Phylidonyris nigra*	✓	4	Significant
	Yellow winged honeyeater	*Unknown*	?		
Various	Willie Wagtail	*Rhipidura leucophrys*	✓		
	Magpie-lark	*Grallina cyanoleuca*	✓		
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	✓		

Group	Common name	Latin name	Observed/ Inferred	Significance	Comments
	Butcherbird	*Unknown*			Survey records 'Butcherbird'
	Australian Magpie	*Gymnorhina tibicen*	✓		
	Australian Raven	*Corvus coronoides*	✓		
	Welcome Swallow	*Hirundo neoxina*	✓		
	Silvereye	*Zosterops lateralis*	✓		
Mammal	Water rat / Rakali	*Hydromys chrysogaster*	~		
	Dolphin		✓		
	Western Grey Kangaroo	*Macropus fuliginosis*	✓		
	Human	*Homo sapien*	✓		
	Long-necked turtle	*Chelodina oblonga*	✓		
	Skink lizard		✓		
	Legless skink		✓		
	Gecko		✓		
	Motorbike frog	*Litoria moorei*	✓		
	Tadpoles		✓		
	Black Bream	*Acanthopagrus butcheri*	✓		
	Fish in river		✓		
	Snails		✓		
Spiders	Huntsman spider		✓		
Ticks	Kangaroo Tick		✓		
Insects	Cicada		✓		
	Hoverfly		✓		
	Caterpillar		✓		
	Butterfly - white		✓		
	Butterfly - yellow		✓		
	Moth		✓		
	Dragonfly		✓		
	Mosquito and larvae		✓		
	Midges		✓		
	Ant		✓		
	Termite		✓		
	Blowfly		✓		
	Ant lion		✓		
	Grasshopper		✓		
	Stink bug		✓		
	Ground burrowing wasp		✓		
	Hornet		✓		
	Stick insect		✓		
Cnidaria	Jellyfish		✓		
Feral animals	Long-billed Corella	*Cacatua tenuirostris*	✓		
	Rainbow Lorikeet	*Trichoglossus haematodus*	✓		
	Fox	*Vulpes vulpes*	✓		
	Dog	*Canis lupus familiaris*	✓		
	Black rat	*Rattus rattus*	✓		
	Cat	*Felis silvestris catus*	✓		
	Rabbit	*Oryctolagus cuniculus*	X saw holes		
	Mice	*Mus musculus*	X strong smell of mice		
	Gambusia	*Possibly Gambusia holbrooki*	?		
	Carp	*Possibly Cyprinus carpio*	?		
	Honeybees	*Apis mellifera*	✓		

Observed ✓ certain ? species uncertain X doubtful/inferred

Significance (Bush Forever: Government of Western Australia 2000)
1=species listed under the *Wilflife Conservation Act 1950*
2=species listed on the JAMBA/CAMBA agreements
3=habitat specialists with a reduced population on the Swan Coastal Plain
4=wide-ranging species with reduced populations on the Swan Coastal Plain locally extinct
E=Endangered (*Commonwealth Protection and Biodiversity Conservation Act 1999*)
R1=Specially protected fauna (*Wildlife Conservation Specially Protected Fauna 1999 Schedule 1)*

Appendix 9 – Advice on the use of Nesting Boxes

Extracted from Birds Australia www.birdsaustralia.com.au/infosheets/info5.html

Nestboxes for Natives

By Hugo Phillipps

Many of us have gardens which we like to see as microcosms of the natural environment, which we plan, plant and manage with varying levels of sophistication, or depth of romantic imagination, to encapsulate the complex systems and symbolism of nature. A part of this passion is devoted to enhancing the garden's attractiveness to native animals, and enticing them to stay and breed. For birds we may provide food and shelter; there are some benefits and dangers associated with both of these. In this information sheet we look at the latter, and especially at the function of nestboxes.

Nests and Nest Sites

Birds' nests are not the `houses' of birds, but places where their eggs may be incubated and chicks fledged. Few birds have any need for nests as such outside the breeding season, although they may roost in the cavities or on the ledges where they will nest later in the season. However, a nest site is often the focus of a breeding territory, and may be used regularly year after year. The lack of appropriate nest sites will limit the breeding distribution of a species.

At its simplest, a nest may be no more than a patch of bare rock or leaf-litter where a seabird or nightjar lays an egg. It may also be a complex container, woven from twigs, plant fibres, leaves and hair, a massive mud bowl, or a pile of sticks. The ability of some birds to construct complex nests enables them to breed in places with no suitable pre-existing platforms or hollows.

Falcons do not build their own nests, but use rock ledges and the old nests of other raptors or crows. Kingfishers and pardalotes tunnel into rotten wood, termites' nests and earth banks. Bee-eaters, Little Penguins and several kinds of petrel dig burrows in sandy soil. Many owls and parrots nest in hollow trees. Most cuckoos have solved the nesting problem by duping other species into raising their young.

Lost Hollows

Many of Australia's bird species are threatened by a variety of causes. However, birds are often most vulnerable when breeding. The loss of their traditional nest sites to agricultural clearing, logging and higher fire frequencies can lead to the extinction of local populations and endanger entire species. Of all the different kinds of nest sites used by birds in Australia, the most threatened are the natural hollows in the trunks and branches of old trees in our forests and woodlands.

It is not just living trees that are important for birds. Many standing dead trees, ringbarked years ago or killed by bushfires, are inhabited by birds. These may still stud the paddocks on farms when all the living ones have gone. One of the biggest threats to these dead trees is the firewood collection industry, which destroys more valuable bird nesting habitat in Australia each year than is turned into woodchips. Those Red Gum logs blazing in suburban fireplaces may have sheltered the chicks of an endangered bird.

Since natural hollows in trees take time to develop, with the largest and deepest hollows only found in the oldest trees, it is the largest of the hollow-nesting birds that are the most vulnerable. These include Australia's large owls and the black-cockatoos. Hollows suitably spacious for these birds to nest in may take centuries to develop. If there is still sufficient food for them to eat, the birds may be present for many years as an ageing population which, unable to breed effectively, fades into extinction.

Parrots, People and Pests

Almost all of Australia's parrots, including the cockatoos and lorikeets, use tree hollows for nesting. Where eucalypt forests and woodlands have been extensively cleared, first for farming and later for industrial and housing development, some species have adapted to nesting in artificial hollows in buildings as well as in introduced ornamental vegetation. For the smaller parrots in industrial and suburban areas, there is not so much a shortage of potentially suitable hollows as a problem with predation and disturbance.

The Common Starling and Common Myna are deliberately introduced pest species that infest many cities and towns in eastern Australia. They are well-adapted to urban and suburban habitats by being able to feed on a wide variety of foods, including much scavenged from human refuse. They compete aggressively and persistently with native birds for nesting hollows. Many suburban householders are familiar with nesting attempts by rosellas, lorikeets or other parrots in their gardens failing because of destruction of eggs or chicks by Mynas.

Another nest hollow and nestbox pest is the feral Honeybee. These may take over nestboxes permanently, as well as natural tree hollows in bushland. They are also suspected of competing with birds such as honeyeaters for nectar, and interfering with the pollination of native plants. Black Rats are good climbers and are known to use nestboxes, as well as to eat the eggs and nestlings of birds using them. Black Rats have caused the extinction of many kinds of birds on islands through predation at the nests.

Design

We must be careful that, if we want to help native birds by providing them with artificial breeding habitat, we do not put more stress on them by building nestboxes for Mynas, Starlings and feral bees. The traditional nestbox design of a cubic box with a sloping roof, a small circular hole neatly cut at the front, with a little perch beneath, comes from countries with different climates and other kinds of birds. It is usually not very appropriate in Australia without modifications and some care given to its dimensions.

The first thing to consider is what kind of birds, or other animals, we wish to encourage to breed in our parks and gardens. Nestboxes are only suitable for birds which naturally nest in hollows, and which occur locally; in most Australian suburban areas these include some parrot species, pardalotes, kookaburras and boobook owls. There are also various kinds of possums and bats that will use nestboxes for breeding and shelter.

Each species varies in size, shape or breeding requirements, and has different, although frequently overlapping, needs which a nestbox can supply. These include different depths, lengths or shapes of hollow, size and placement of entrance, height above ground, and protection from predators. There are different designs of nestbox, and different placement requirements, for most kinds of hollow-using bird or mammal you are likely to find in Australia's suburban parks and gardens.

Materials

A huge variety of materials can and have been used to make nestboxes, with some more appropriate than others. Wood is traditionally the most widely-used - as plywood, sawn timber or as sections of naturally hollow log. However, because of the continuing decline in the number of natural tree hollows, it would be tragically ironic to create a market for hollow logs as nestboxes. Sawn plantation timber, or plywood, can be used; but must be painted or otherwise treated for durable outdoor use. Generally, the thicker the material the better.

Placement

Nestboxes, more than anything else, provide protection from the weather and from disturbance. They need to be well insulated from wide temperature fluctuations, rain-proof and facing away from

prevailing winds and direct midday summer sunlight. They need drainage holes to prevent moisture build-up, and must be attached firmly so that they will not vibrate nor be easily detached by a predator.

Nestboxes may be ideally designed, but still be useless if they are not placed appropriately or protected from their main introduced predators. For birds in Australian city gardens, these are principally dogs, foxes, cats and rats. It is fairly easy to put nestboxes out of reach of dogs, but to make sites inaccessible to cats and rats may require the use of tree-guards or exclusion collars on branches. Native predators such as snakes, goannas, kookaburras and currawongs are protected, and should not be harassed.

Nestboxes can be fixed to existing trees and buildings. They must be attached securely so that they do not shift or shake in response to strong winds or being knocked by the movements of, for example, possums. One important consideration is protection from human disturbance. This may not be a serious problem on private property, but elsewhere it may necessitate nestbox concealment, or placement where casual access is impossible. They must, however, be accessible to land managers and researchers for maintenance and monitoring.

Management

If your intention in having a nestbox is to replace lost breeding habitat or shelter for native birds or mammals, you will have to manage it. This means removing the eggs and nestlings of Common Starlings and Common Mynas and destroying the nests of feral Honeybees or European Wasps. Deterring Mynas and Starlings from renesting is not easy; these pests are very persistent, and constant vigilance is necessary. This also means that you must have convenient regular access to the nestbox, and that you must be aware of what creatures are using it for what purposes.

Monitoring

The birds and other animals that use nestboxes in your garden do so in the context of a strongly human-modified environment. By thoughtful nestbox design, construction and placement, you can enrich this environment for native fauna that might otherwise be unable to continue living there. However, it is not easy to keep track of the changes that occur without some systematic recording of what takes place in your garden from day to day.

Just by keeping regular notes of what birds are present, in what numbers and what they are doing, you become environmentally aware. The notes for any one day may not seem particularly significant, but over the months and years they build a valuable record of seasonal changes, responses to droughts or bushfires elsewhere, and long-term declines or increases that reflect major environmental change. By contributing your information to one of the BIRDS AUSTRALIA community environmental surveys you will be helping to sound the alarm on damaging trends so that we can do something to halt or reverse them.

Further Reading

The Nestbox Book. (A Gould League publication, available from Birds Australia).

Recommended nestbox dimensions for Australian birds and mammals compiled by Hugo Phillipps.

Appendix 10 – Native plants mentioned in the text

Common name	Latin name
Tall trees	
Marri	*Corymbia calophylla*
Tuart	*Eucalyptus gomphocephala*
Jarrah	*Eucalyptus marginata*
Flooded gum	*Eucalyptus rudis*
Small to medium trees	
Peppermint	*Agonis flexuosa*
Common sheoak	*Allocasuarina fraseriana*
Candle banksia	*Banksia attenuata*
Holly-leaf banksia	*Banksia ilicifolia*
Swamp banksia	*Banksia littoralis*
Firewood banksia	*Banksia menziesii*
Rottnest cypress	*Callitris preissii*
Salt sheoak	*Casuarina obesa*
Saltwater paperbark	*Melaleuca cuticularis*
Moonah, Rottnest tea-tree	*Melaleuca lanceolata*
Modong, stout paperbark	*Melaleuca preissiana*
Freshwater paperpark	*Melaleuca rhaphiophylla*
Christmas tree	*Nuytsia floribunda*
Medium to Tall shrubs	
Spearwood	*Kunzia ericifolia*
Balga, Grass tree	*Xanthorrhoea preissi*
Perennial herbs	
Red and green kangaroo paw	*Anigozanthus manglesii*
Coast saw-sedge	*Gahnia trifida*
Shore rush	*Juncus kraussii*
Sedge	Collective name for grassy, rush-like or flag-like plants often growing in wet places
Samphire	Succulent coastal and estuarine plants of the *Halosarcia* and *Sarcocornia* genus.
Aquatic plants	
Typha, native bulrush, yanget	*Typha domengensis*

Appendix 11 – Desktop Survey Template

Open Area Desktop Assessment

Background information. Complete initially at the deskop and verify in the field.
(Adapted from the Perth Biodiversity Project Assessment Template)

Date of assessment _____ Name of assessor _____

Name of area _____ Site No. _____

Other names used _____

Location (address/street name incl. suburb, nearest street corner, Local Government)

_____

Street Directory: Year, Page and Grid Ref. (Street Smart) _____

Prepare the following maps and label with the name of the area.

Map: Aerial photograph of ☐ _____

Date of photography _____ Scale _____

Area (ha) _____ Perimeter (m) _____ Perimeter (m) to area (m^2) ratio _____

Lot/Location/Reserve Number/s _____

Ownership (Local Government Reserve / Other Govt (Agency?) / Private) _____

_____

Land Manager _____

Vesting Purpose _____

MRS Reservation or Zoning _____

TPS Reservation or Zoning _____

Current Status/Use of land _____

Long term plans? _____

Recognised International/ National/ State/ Regional Conservation Value --

Specify _____

Part of a Draft Regional Ecological Linkage --

Links to where? _____

Distance to nearest vegetated area(m) Name Area(ha)

Distance to nearest vegetated area(m) Name Area(ha)

Part of a Local Ecological Linkage -- Mark on Map 1

Surrounding land use _____

Mapped Vegetation Complex/es _____

Mapped Soil Type/s (if mapping available) _____

Mapped wetland/s: -- Environmental Protection Policy (EPP) Lake: --

Wetland Management Category: CC/RE/MU

Is it a mapped floodplain area? --

Potential Reference Sites and Plots (e.g. Bush Forever Sites; CALM Reserves, see Map 2). For Bush Forever Sites note floristic community type/s (FCTs) and whether FCTs actual or inferred.

Species list attached? --

Existing biological information for area or for potential Reference Sites (reports/ surveys/ species lists)

Conservation Management Plan -- Current or Review needed? --

Title/Author/Year

Known value to the local community? --

Active Friends/Environmental Group --

Name of group and contact details

Surrounding land uses with potential for community interest and possibly assistance with management

- educational facility --
- residential development --
- other (specify) --
- other (specify) --

Indigenous or European Cultural or Historical Heritage Value --

Notes

Appendix 12 – Field Survey Template

Open Area Field Assessment

(Adapted from the Perth Biodiversity Project Assessment Template)

Name of area _____ Site No. _____

Address _____ Date _____

Assessor _____ Trained yes/no

Recorder _____ Trained yes/no

Recorder _____ Trained yes/no

Recorder _____ Trained yes/no

Photographer's Name _____

Photographs - Indicate location and direction of each photo on Map 3 during the field assessment.

To complete this assessment:

- **Walk around the entire area to get a general idea of vegetation, weeds, disturbing factors**
- **Identify different vegetation communities**
- **Prepare the map. Show the outline of each vegetation communities on the map. Number each vegetation community.**
- **Fill out pages 2 & 3 for each vegetation community**
- **Fill out other pages for entire site (you may wish to find some shade to do this) adding details to map where required**

1. Prepare Map 3 (on tracing paper laid over aerial photograph): Show Uplands/Wetlands, Structural Plant Communities, Spot Weed Occurrences, Areas of Disturbance and Infrastructure

On Map 3 divide the site into upland versus wetland areas and then into broad sections based on structural plant communities. Allocate a number to each different vegetation community type and describe each community. If helpful collect specimens for identification or take photos. Carefully label all specimens.

Complete pages 2&3 for **each** plant community identified.

The following definitions may be of assistance

Growth Form Layers (Adapted from Keighery 1994, McDonald et al 1990 and Executive Steering Committee for Australian Vegetation Information 2003)	
Tree:	single trunk and canopy, the canopy is less than or equal to ⅔ of the height of the trunk, no lignotuber apparent
Mallee:	woody plant with many woody stems, canopy well above the base, lignotuber usually apparent, commonly of the genus *Eucalyptus*
Shrub:	woody plant with one or many woody stems, foliage all or part of the total height of the plant, includes grass trees and cycads
Herb:	non-woody plant with stems, generally under 0.5 m tall and not a grass, sedge or rush (e.g. kangaroo paw, dianella)
Grass:	non-woody plant with inconspicuous wind pollinated flowers;
Sedge/Rush:	non-woody, tufted or spreading plant; most have inconspicuous flowers that are pollinated by wind;
Climbers:	plants that climb or scramble over other plants for support

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Fill in this and next page for each vegetation community shown on Map 3

Vegetation community number _____ (as shown on Map 3) Brief Description

_____

2. In the table below please note species observed and tick whether they are Native or Exotic

Trees Over 10m	Native	Exotic	**Trees under 10m**	Native	Exotic	**Shrubs over 2m**	Native	Exotic
Total Crown Cover %: 2-10% / 10-30% / 30-70% / over 70%			**Total Crown Cover %**			**Total Crown Cover %**		
Shrubs under 1-2m	Native	Exotic	**Shrubs under 1m**	Native	Exotic	**Herbs**	Native	Exotic
Total Crown Cover %:			**Total Crown Cover %:**			**Total Crown Cover %:**		
Sedges/Rushes	Native	Exotic	Grasses	Native	Exotic	Other (e.g. Climbers)	Native	Exotic
Total Crown Cover %:			**Total Crown Cover %:**			**Total Crown Cover %:**		

Fill in this and previous page for each vegetation community shown on Map 3

3. Upland or Wetland? (circle one) **Landscaped or Natural Remnant (circle one)**

Icon Flora Species (Note if present) _____

SLOPE: flat/ gentle/ steep

DRAINAGE: well/ moderate/ poor/ unknown **WET: all year/ winter and spring only OR n/a**

LITTER (% cover & depth):_____ **BARE GROUND (% cover)** _____

4. Use the classification system below to describe this vegetation community (e.g. tall open forest of eucalypt over open forest of melaleuca etc)

Classification System Used to Describe Vegetation Structure (Keighery 1994), as adapted from Muir (1977) and Aplin (1979)

Growth Form/ Height Class	Canopy Cover			
	100% to 70 %	**70% to 30 %**	**30% to 10 %**	**10% to 2 %**
Trees over 30 m	Tall Closed Forest	Tall Open Forest	Tall Woodland	Tall Open Woodland
Trees 10-30 m	Closed Forest	Open Forest	Woodland	Open Woodland
Trees under 10 m	Low Closed Forest	Low Open Forest	Low Woodland	Low Open Woodland
Mallee over 8 m (Tree Mallee)	Closed Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee under 8 m (Shrub Mallee)	Closed Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub
Shrubs over 2 m	Closed Tall Scrub	Tall Open Scrub	Tall Shrubland	Tall Open Shrubland
Shrubs 1-2 m	Closed Heath	Open Heath	Shrubland	Open Shrubland
Shrubs under 1 m	Closed Low Heath	Open Low Heath	Low Shrubland	Very Open Shrubland
Grasses	Closed Grassland	Grassland	Open Grassland	Very Open Grassland
Herbs	Closed Herbland	Herbland	Open Herbland	Very Open Herbland
Sedges	Closed Sedgeland	Sedgeland	Open Sedgeland	Very Open Sedgeland

Complete the remaining pages for the entire site

Use blank paper if require more space. Note question number against extra comment.

5. Native Fauna and Fungi. List species observed or evidence of presence or circle species (overleaf) Tick if observed directly. Note if young animals present, nests, feeding.

Species/description (Tick if observed directly)	✓	**Comments:** evidence of presence (scats, tracks and traces) or likely habitat? Observed on other occasions	**Iconic** ✓

6. Native Fauna and Fungi Habitat (look and listen for birds, insects, fauna, fungi and match to habitat - trees, trees with understorey, old tree hollows, perches such as dead branches, dead vegetation, branches/rotting logs, leaf litter, rocky outcrops, moss beds, wetlands, waterways))

Habitat	**Comments**

Fauna you may observe – please list all fauna observed, or traces on reverse

Small mammals: Brush-tailed Possum, Native water rat (Rakali), Western Grey Kangaroo

Waterbirds:

Blue-billed Duck	Musk Duck	Pacific Black Duck
Australasian Shelduck	Freckled Duck	Pink-eared Duck
Black Swan	White-eyed Duck	Mallard X
Domestic Duck	Grey Teal	Australian White Ibis
Straw-necked Ibis	Glossy Ibis	Great-crested Grebe
Hoary-headed Grebe	Australasian Grebe	Little Pied Cormorant
Pied Cormorant	Little Black Cormorant	Black Cormorant
Darter (snake bird)	Buff-banded Rail	Pelican
Nankeen Night Heron	White-faced Heron	Little Egret
Great Egret	Yellow-billed Spoonbill	Eurasian Coot
Dusky Moorhen	Purple Swamphen	Clamorous Reed Warbler
Common Sandpiper	Black-winged Stilt	Black-fronted Dotterel
Pied Oystercatcher	Swamp Harrier	Black-Shouldered Kite
Osprey		

Other birds:

Australian Raven	Black-faced Cuckoo Shrike	Laughing Turtle-dove
Spotted Turtle-dove	Brown Honeyeater	Siging Honeyeater
New Holland Honeyeater	White cheeked Honeyeater	Red Wattlebird
Little Wattlebird	Welcome Swallow	Little Grassbird
Tree Martin	Willie Wagtail	Magpie Lark
Australian Magpie	Galah	28 Parrot (ringneck)
Rainbow Lorikeet	Silvereye	Rufous Whistler
Silver Gull	Nankeen Kestrel	Corella species
White-tailed Black Cockatoo	Grey Fantail	Western Gerygone
Southern Bookbook	Barn Owl	Tawny Frogmouth

Reptiles: Long-necked turtle Skinks Bobtail lizard

Frogs:

Moaning frog (moaning call)
Pobblebonk Frog (makes "bonk" sound like banjo string being plucked)
Motorbike frog (you guessed it, sounds like a motorbike revving up through gears)
Crinia species (usual frog croak)
Tadpoles

Invertebrates: Dragonflies, Mosquitoes, termite mounds, ants

Other: Fish, Ticks, what else?

7. Synopsis of biodiversity values of site including links to other areas (wetland, waterway, remnant vegetation, revegetation with local species, links to other areas, provides habitat (list), provides food (list), has a range of ages of vegetation, esp trees, young plants growing from seed fallen from adult trees (preferably local species), thick leaf litter, fallen branches,, perches, note if observe animals nesting, feeding)

Biodiversity values of this site include	Comments

8. Vegetation Health Note dead or dying trees, shrubs, herbs, trees staghorns, heavy leaf/stem damage, plants dry or waterlogged, stunted, poor growth, yellow foliage and so on. Note the species concerned and the pattern of deaths/changes in the vegetation (e.g. a group of trees affected in similar way). Looking for trends or patterns rather than individual deaths.

Poor Vegetation Health	Comments

9. Feral Fauna Note species observed or evidence of presence (e.g. Foxes (burrows, wildlife kills), Rabbits (burrows, dung piles, grazing), Dogs (droppings, scratchings), Cats (wildlife kills), European Honey Bees (hives in tree hollows), Rainbow Lorikeet/Corella. Include anecdotal evidence. Tick if animals obersved directly

Feral Fauna - Tick if observed directly	✓	Comments

10. Existing Management Infrastructure

Describe below and mark location on Map 3, photograph if required. Note whether vegetation cleared/damaged for access

Infrastructure	✓	Comments (material type, condition)
Fencing		
Gates		
Paths		
Type: Soil; concrete; limestone; mulch		
Access tracks		
Type: Slashed; sprayed; ploughed		
Signs (name of area or other purpose?)		
Drains (in/out lakes)		
Power/Gas/other		

11. Social Significance Values Evidence of use, active/passive recreation, cycle/recreational path, signage, educational interest, landscape value (does it buffer or screen conflicting land uses), scenic features (high point), Indigenous of European Heritage (cultural or historic), grafitti, bedding, fires, other

Social Values	Comments

12. Surrounding Land Uses (mark on Map 3) note type/s and indicate likely impacts/benefits e.g. source of rubbish; weed seeds blowing into site; potential for community interest and perhaps volunteers

Surrounding land uses	Comments

13. Weed Species Note species observed, especially occurrence in better condition areas, even if they only occur in small numbers or in small patches at present. Note the distribution of each species across the site, e.g. throughout the site, spot occurrences or disturbed areas only (edges/tracks/cleared areas). Mark spot occurrences and easily mapped distributions on Map 3. If a species is widespread, note whether it is restricted to specific plant communities or wetland areas.

Weed Species	Distribution (e.g. throughout site, spot occurrences, disturbed areas only (edges/tracks/cleared areas)	Priority for control ✓

14. Disturbance Factors and Threatening Processes

If appropriate, mark on Map 3 and photograph as required. Look for the following

Rubbish	Soil dumping	Garden waste	Illegal crops (mark clearly on map ☺)
Damaged vegetation	Tracks	Vandalism	Graffiti, spray cans
Fire	Evidence of arson	Overgrazing	Bedding/cubbies
Erosion	Algal bloom	Oily scum	Orange discoloured water/soil (test pH)
Revegetation with inappropriate species		Off road vehicles (bmx or motorised)	

Factor/Process	Comments
;	

15. Recommendations for Management

List potential management actions (for example weed control, fencing; repairs; signage to identify as a conservation area; rubbish removal; detailed weed survey and mapping; management planning to address problems like anti-social behaviour; detailed flora/fauna/fungi surveys).