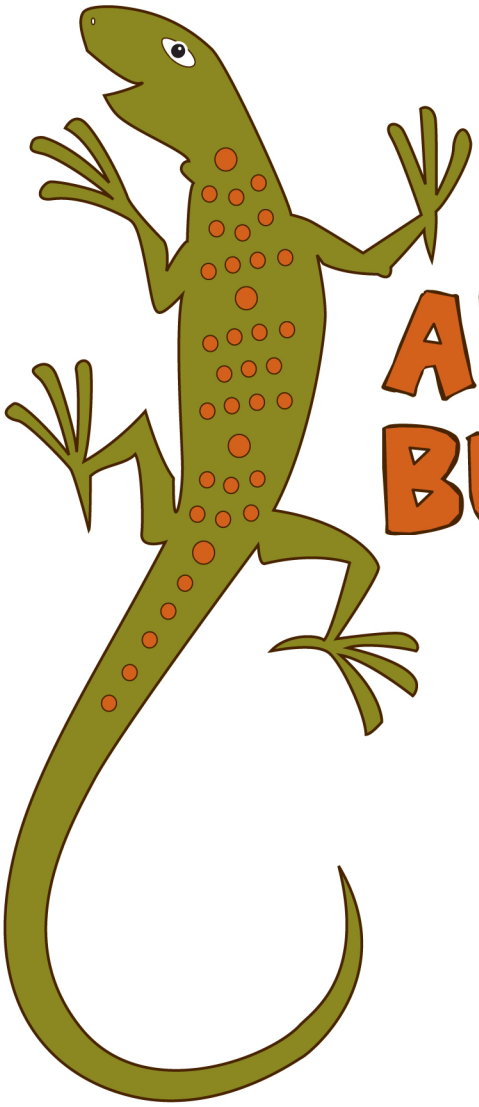

City of Wanneroo

ADOPT A BUSHLAND

TOPIC 1

SETTING THE SCENE

ADOPT A BUSHLAND – TOPIC 1

SETTING THE SCENE

Wanneroo is one of the fastest developing areas in Western Australia, with large areas of bushland under threat from land clearing and urbanisation.

The City of Wanneroo's natural environment is a valuable asset. It includes a rich diversity of plants, animals, ecosystems and living landscapes. The City of Wanneroo is situated in one of the worlds top 25 biodiversity hotspots and is recognised for its unique flowering plants (City of Wanneroo, 2005).

HOW DO YOU FIT INTO THE BIGGER PICTURE?

We live in Perth, the capital city of Western Australia situated in the south west of the state. The City of Perth and its surrounding suburbs are called the Perth Metropolitan Region (PMR).

The PMR covers an area of approximately 534,216 hectares and spans from Two Rocks in the north to Rockingham in the south, and from the Darling Scarp in the east to the Indian Ocean in the west. The PMR is divided into 30 local governments, with the City of Wanneroo bordering the north.

The City of Wanneroo has three local councils neighbouring it. The City of Joondalup borders the City of Wanneroo to the West with the City of Swan bordering the East and the City of Stirling sits to the South.

Perth has a Mediterranean climate with mild wet winters and warm dry summers. Average temperatures vary from 24ºC in summer to 13ºC in winter. Typically June and July are the wettest months, with summer rainfall being low and erratic, influenced by cyclonic systems.

THE SWAN COASTAL PLAIN

The area of the PMR between the Indian Ocean and the Darling Scarp is called the Swan Coastal Plain (SCP).The SCP is largely made up of sandy soil that originated from the ocean, including washed up shell fragments, which form a series of dunes.

Sand dunes on the beach (Quindalup dunes) are constantly changing and moving. With the movement of oceans waves and near constant winds, the sand is constantly shifting to create new dunes.

DID YOU KNOW

Aboriginals have populated WA for over 50,000 years!

Explorers from Holland and France visited our coastline as early as the 1600's!

Captain James Stirling founded the City of Perth in 1829!

Support Materials Appendix

1.1 Map of Western Australia

1.2 Map of Perth Metropolitan Region

1.3 Map of City of Wanneroo Conservation Areas

There are three dune systems running parallel to the coast, **Bassendean**, **Spearwood** and **Quindalup**. It is the dunes soil type that largely determines what vegetation grows there.

Bassendean Dune System

The oldest and least fertile of the dunes is the Bassendean Dune System, which occurs closest to the Darling Scarp.

- Soils: pale grey, sometimes with faint yellow colouring.
- Vegetation: Banksia woodlands.

Some suburbs located on the Bassendean soils are Wanneroo, Ashby, Tapping and Wangara.

Spearwood Dune System (Karrakatta / Cottesloe Soils)

The eastern most side of the Swan Coastal Plain is the Karrakatta soils.

- Soil: yellow sands with a limestone lower layer and grey surface colouring, due to organic matter.
- Vegetation: Jarrah (*Eucalyptus marginata*), smaller tree species and understorey shrubs.

On the western side are the Cottesloe soils.

- Soil: brown or yellow sand, limestone close to the surface and often visible.
- Vegetation: deep soils have tall mallee Eucalyptus and shallow soils have medium / small shrubs.

Some suburbs located on the Spearwood dune system include Ridgewood, Butler, Clarkson, Nowergup and Mindarie.

Quindalup Dune System

Along the coast are the most recently formed soils, the Quindalup Dunes.

- Soil: white limey sands.
- Vegetation: coastal heath, which changes rapidly from close to the ocean where conditions are quite extreme, to the milder conditions inland.

The Quindalup dune system is found on the oceans edge, making up part of the beach. Suburbs like Mindarie, Quinns Rocks, Yanchep and Two Rocks sit at the edge of the Quindalup dunes. Wetlands

FUN FACTS

You actually live on top of the Swan Coastal Plain!

Dune and soil names are suburb names too!

Plants are clever, only growing in soil they like best!

There are over 10 wetlands in the City of Wanneroo!

Wetlands are much drier now than they were in the past!

Support Materials Appendix

1.4 Cross-section of PMR showing major landforms

1.5 Jarrah / Banksia Woodland.

1.6 Banksia Woodland

1.7 Coastal Heath

City of Wanneroo
ADOPT A BUSHLAND

TOPIC 1
SETTING THE SCENE

The Swan Coastal Plain has an extensive system of wetlands including lakes, swamps and damplands. Chains of wetlands occur between the Bassendean and Spearwood dunes, including Lake Pinjar and Lake Jandabup.

Another wetland chain occurs in the Spearwood dunes including Lake Joondalup in Yellagonga Regional Park and Loch McNess in Yanchep National Park. These wetland systems are fed by groundwater held in our sandy porous soils. This source of water also supplies 60% of Perth's drinking water (DoW, 2008).

THE CITY OF WANNEROO

The City of Wanneroo covers an area of 68,580 hectares. Its northern boundary is Two Rocks, situated 60km from Perth City, with its southern boundary being Beach Road in the suburb of Koondoola, situated 10km from Perth City.

The City of Wanneroo contains many bushland reserves, large expanses of wetlands, limestone hills and coastal dunes, all of which help give the City its character.

The population of the Perth Metropolitan Region is large and increasing rapidly. In the City of Wanneroo the population at the end of 2007 was 126,062 and is expected to rise to 242,120 by the year 2020 (City of Wanneroo, 2007).

Our Local Plants

Soils on the SCP are very poor in nutrients. Fertiliser, mulch and large quantities of water are required to establish a garden or vegetable patch with non-native plants that have difficulty surviving in the local environmental conditions.

Local native plants have no problems living with our soils. They have adapted to grow successfully and flower brilliantly in very poor soil conditions. The adaptations of local native plants show themselves in many different ways including:

- leaf shape and size;
- leaf composition;
- modified root systems;
- dormant over summer; and
- nutrients from other sources (such as insectivorous and parasitic plants).

DID YOU KNOW

Special leaf shapes and features help plants reduce loss of water through evaporation! Eg. Jarrah leaves are covered in a waxy coating that decreases the amount of water lost through transpiration.

Plants have specialised root systems that maximise extraction of nutrients.

Mycorrhiza (fungi) on plant roots help them get nutrients from soil! Eg. Eucalypts and Orchids.

Some plants eat insects and are called insectivorous! Eg. The Red Ink Sundew (*Drosera erythrorhiza*).

City of Wanneroo
ADOPT A BUSHLAND
TOPIC 1
SETTING THE SCENE

Changes to the Land

It is important to remember that before European settlement Aboriginal people already inhabited Australia. The Aborigines lived on the land, utilising its natural resources.

The Swan Colony was settled in 1829. Over the past 175 years there have been numerous changes to the Perth we know today. The most evident change is land clearing. This is happening all around us to make way for infrastructure, including housing and roads, as well as shopping centres, sporting facilities, schools, hospitals and industry.

In the process of land clearing, patches of bushland have been left. Many of these have been set-aside as reserves and parks, and it is very important to ensure that bushland remains part of our every day environment.

Conservation Areas

Yanchep National Park is the largest conservation reserve on the Swan Coastal Plain. It includes wetlands, shrublands, Tuart, Jarrah and Banksia Woodlands.

Other conservation areas you might have been to are Whiteman Park, Bold Park, Herdsman Lake and Kings Park.

The City of Wanneroo has over 94 reserves, which contain areas of bushland. These are very important and together cover an area of 2,162 hectares. They are accessible to the general public and when near a school can provide a valuable resource for environmental education.

Definition of Bushland

Bushland is land on which there is vegetation, which is either a remainder of the natural vegetation of the land, or if altered, is still representative of the structure and floristics of the natural vegetation, and provides the necessary habitat for fauna (Del Marco et al., 2004).

FUN FACTS

Bushland clearing means plants and animals lose their homes!

Since European settlement, 94 plant, 2 bird and 13 mammal species have become extinct in Australia!

This is considered to be one of the highest extinction rates in the world!

Larger numbers of plants and animal species are endangered today!

(Keighery & Huston, 1994)

Support Materials Appendix

1.8 Land clearing for development in Butler.

1.9 Changes over time.

City of Wanneroo
ADOPT A BUSHLAND
TOPIC 1
SETTING THE SCENE

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TOPIC 1 - SETTING THE SCENE

TEACHER INFORMATION SHEET

Aims:

- To identify where the school fits into the PMR and into the local suburb.
- Obtain an appreciation of the park/bushland areas that are near their school and to identify which of these areas contain a patch of bushland on them.

Activity 1: Setting the Scene

1. Use the map of the Western Australia (1.1) to identify where Perth is on the Map.
2. Use the Map of the Perth Metropolitan Region (PMR) (1.2) to locate the Wanneroo region.
3. Make a photocopy from a street directory of the areas where your school is located and distribute to the students or use the City of Wanneroo Conservation Areas Map (1.3).
4. Have the students use the "Setting the Scene" student worksheet to follow the instructions for identifying where your school is on the map.
5. The students will then locate their home on the map (if they live in the area).
6. Ask the students to locate where they think the parks are in the area by drawing their attention to the map key provided and how many they can find.
7. Using grid paper or ruler, have the students calculate the ratio of the area of parkland/bushland to the total area of the suburb.
8. Using their local knowledge, have the students look at the parks marked and see if they know how many of these areas have bushland on them.
9. Your may need to work with the whole class to draw on all their knowledge to complete the section on what areas have bushland on them.

CURRICULUM FRAMEWORK LEARNING OUTCOMES

Society and Environment

Aspect: Investigation, Communications and Participation.

Aspect: Place and Space

Aspect: Resources

Aspect: Culture

Aspect: Time, Continuity and Change

Aspect: Natural and Social Systems

Aspect: Active Citizenship

Science

Aspect: Investigating

Aspect: Earth and Beyond

Aspect: Life and Living

Aspect: Acting Responsibly

Aspect: Life and Living

What you will need:

Clipboard, paper, grid paper or ruler, calculator, pencil/pen, photocopy of appendix maps (1.1–1.3), "Setting the Scene" student worksheet, photocopy of UBD map of your schools local suburbs.

Activity 2: Setting the Scene Quiz

Test the students knowledge with the 'Setting the Scene' quiz.
The answers to the quiz are as follows:
1(b); 2(c); 3(a); 4(a); 5(b); 6(c).

Activity 3: Setting the Scene Wordfinder

Let students compete to finish the 'Setting the Scene' wordfinder.
The locations for the words are as follows:

K	B	S	D	F	B	D	U	F	A	L	U
W	A	N	N	E	R	O	O	X	S	A	L
E	S	D	N	A	L	H	S	U	B	R	M
T	S	P	E	A	R	W	O	O	D	U	P
L	E	S	K	J	E	P	Q	Z	U	T	E
A	N	X	V	C	N	A	W	H	N	A	R
N	D	E	V	E	L	O	P	M	E	N	T
D	E	K	P	B	I	Y	L	G	P	J	H
L	A	T	S	A	O	C	A	S	B	L	P
W	N	P	U	L	A	D	N	I	U	Q	F
H	J	U	O	L	E	G	T	H	M	X	C
W	V	N	Q	R	M	F	S	G	S	V	T

What you will need:
Each student will require a copy of the crossword and colouring in pencils/pens.

CURRICULUM FRAMEWORK LEARNING OUTCOMES

Society and Environment

Aspect: Investigation, Communications and Participation.

Aspect: Place and Space

Aspect: Resources

Aspect: Culture

Aspect: Time, Continuity and Change

Aspect: Natural and Social Systems

Aspect: Active Citizenship

Science

Aspect: Investigating

Aspect: Earth and Beyond

Aspect: Life and Living

Aspect: Acting Responsibly

Aspect: Life and Living

City of Wanneroo
ADOPT A BUSHLAND
TOPIC 1
SETTING THE SCENE

ADOPT A BUSHLAND – TOPIC 1

Activity 1: Setting the Scene

In groups, complete the following.

1. Locate your suburb on the map of the City of Wanneroo.

2. Locate your school on the map of your suburb. Mark the spot with a marker pen.

3. Locate your home on the map. Mark the spot with a marker pen.

4. Locate parks around your suburb on the map. Colour these in green on your map.

5. How many parks did you find? _____

6. Calculate total area of urban development (housing, industry, shops, roads) and the total of bushland.

7. What were your results?

_____

_____

_____

8. Using the knowledge of your local area how many of these parks in your suburb have bushland in them? Mark these areas on your map and list them below.

_____

_____

_____

Activity 2: Setting the Scene Quiz

1. What does PMR stand for?
a) Perth's Many Rabbits
b) Perth Metropolitan Region
c) Perth Main Roads

2. What is the area between the Indian Ocean and the Darling Scarp called?
a) Great Perth Shelf
b) Western Australia
c) Swan Coastal Plain

3. What local Council covers an area of 687km2, from Koondoola in the south to Two Rocks in the north?
a) City of Wanneroo
b) City of Wangara
c) City of Wallaby

4. An area of bushland set aside for conservation is called a?
a) Reserve
b) Play ground
c) backyard

5. Lakes and swamps are also called?
a) Beaches
b) Wetlands
c) Bushland

BONUS QUESTION!

How many dune systems is there in the Perth area?
a) 5
b) 9
c) 3

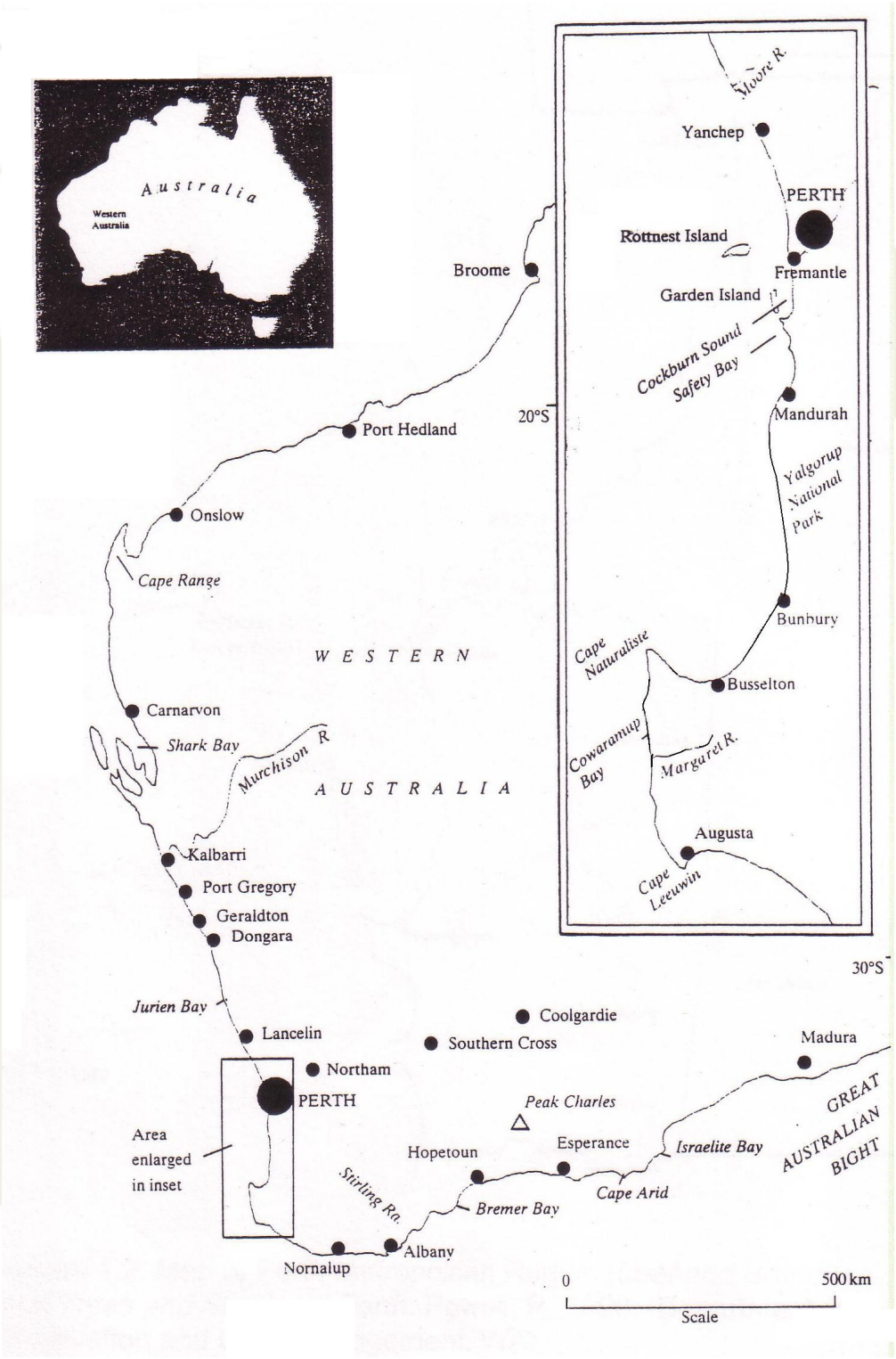
Activity 3: Setting the Scene Wordfinder

Find the listed words in the letter jumble and colour them in!

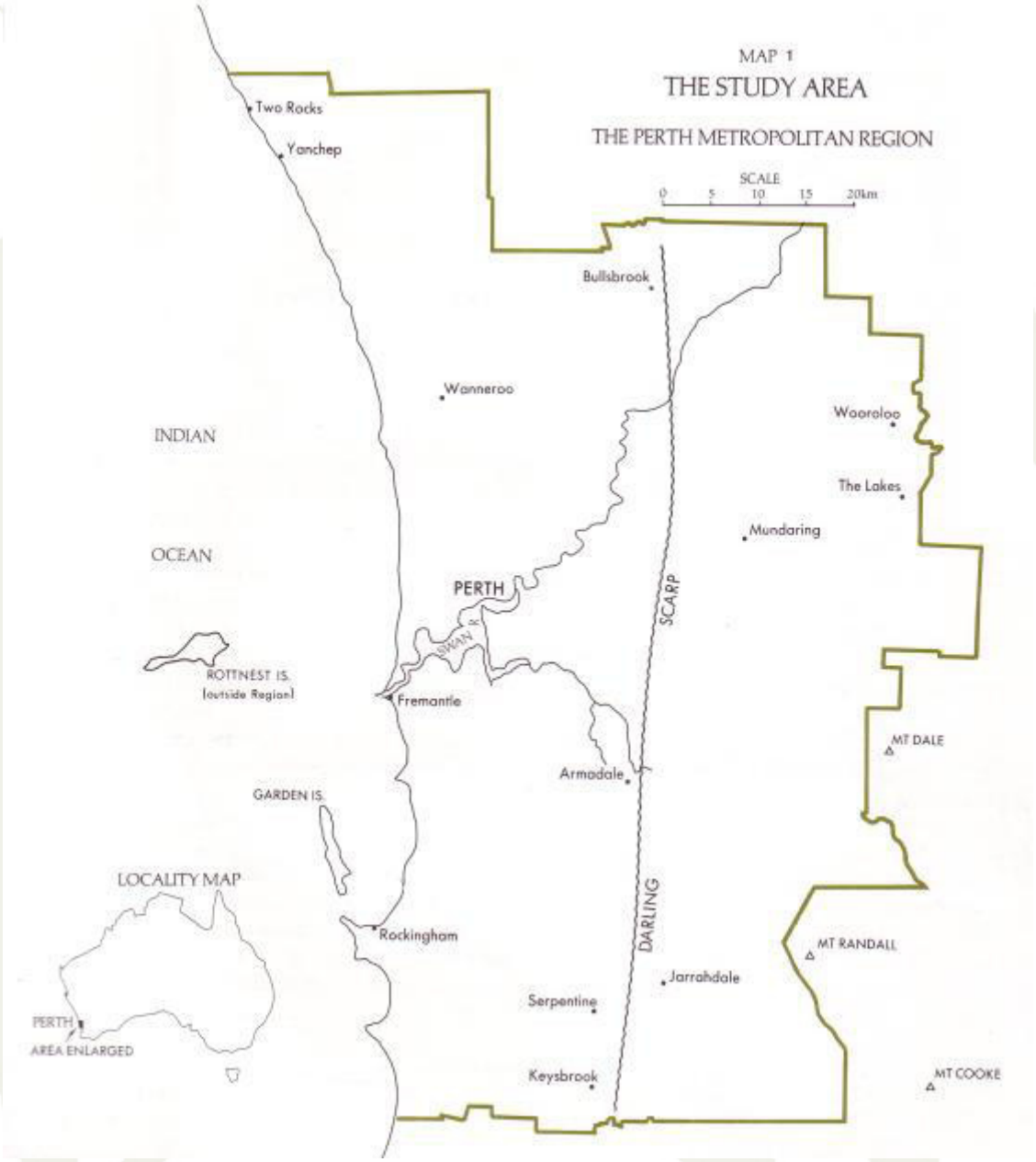
Perth	Wanneroo
Dune	Wetland
Coastal	Bushland
Bassendean	Plants
Spearwood	Development
Quindalup	Natural

K	B	S	D	F	B	D	U	F	A	L	U
W	A	N	N	E	R	O	O	X	S	A	L
E	S	D	N	A	L	H	S	U	B	R	M
T	S	P	E	A	R	W	O	O	D	U	P
L	E	S	K	J	E	P	Q	Z	U	T	E
A	N	X	V	C	N	A	W	H	N	A	R
N	D	E	V	E	L	O	P	M	E	N	T
D	E	K	P	B	I	Y	L	G	P	J	H
L	A	T	S	A	O	C	A	S	B	L	P
W	N	P	U	L	A	D	N	I	U	Q	F
H	J	U	O	L	E	G	T	H	M	X	C
W	V	N	Q	R	M	F	S	G	S	V	T

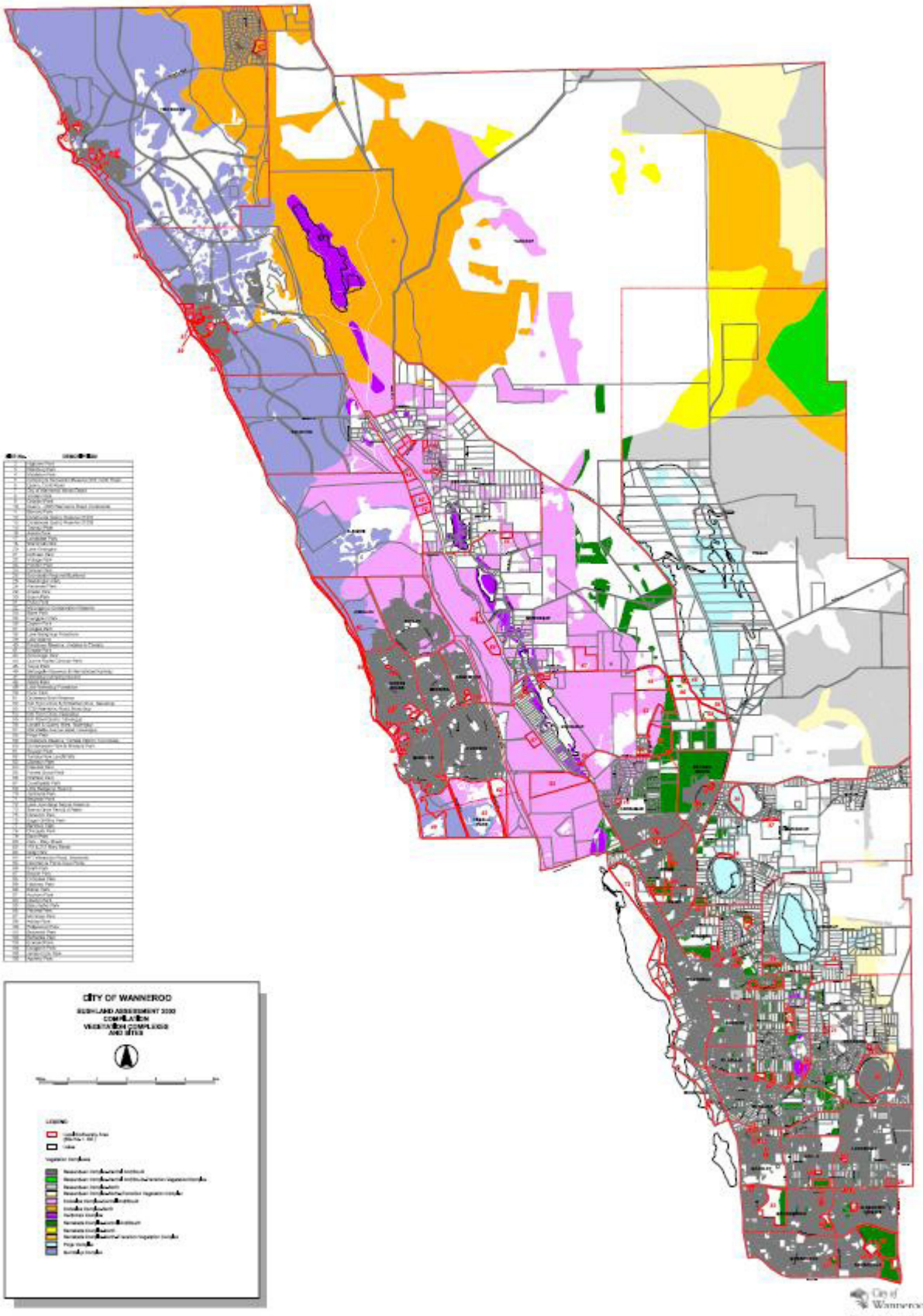
APPENDIX



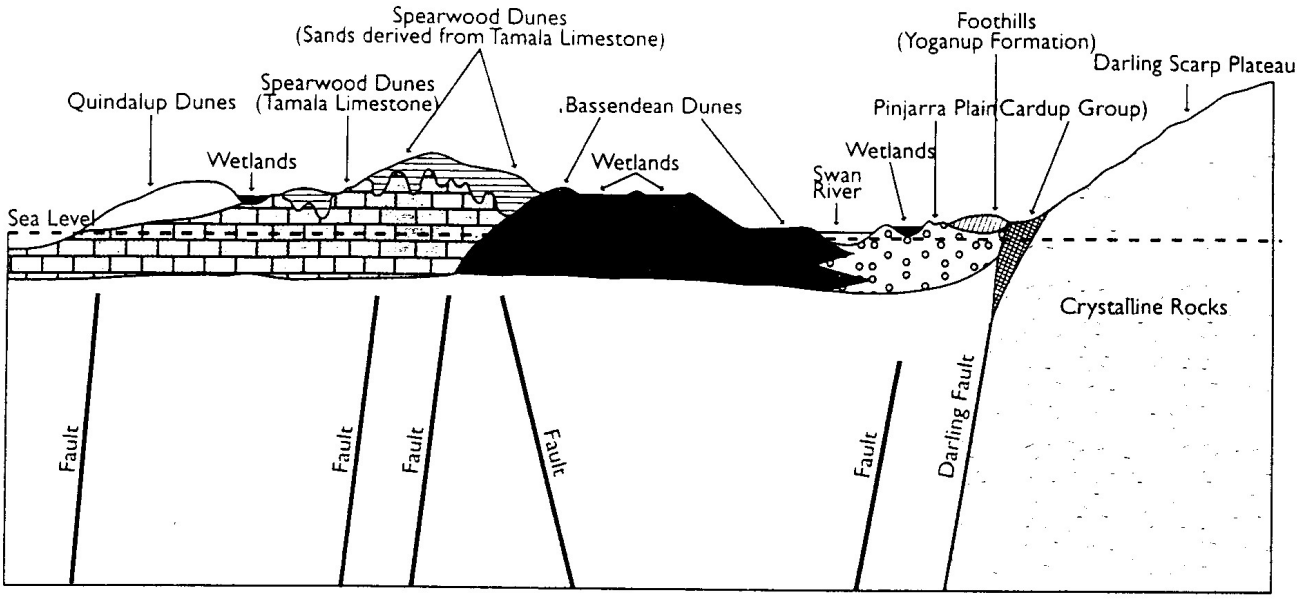
1.1 Map of Western Australia (Rippery & Rowland, 1995).



1.2. Map of Perth Metropolitan Region (Powell, 1990).



1.3: Map of City of Wanneroo Conservation reserves
A full sized version of this map can be downloaded from the City of Wanneroo website.



A 'typical' transect of the major geomorphological systems of the Swan Coastal Plain after McArthur and Bettenay (1960) followed by major geological systems after Playford *et al.* 1976

Foothills (Ridge Hill Shelf)

Yoganup Formation

Cardup Group

Bassendean Dunes

Bassendean Sand

Pinjarra Plain

Guildford Formation

Spearwood Dunes

Tamala Limestones

Sands Derived from Tamala Limestones

Quindalup Dunes

Safety Bay Sands

Adapted with permission from Fact Sheet 15. The Geology of Perth.
Department of Minerals and Energy, Western Australia.

1.4 Cross section of Perth Metropolitan Region (Government of Western Australia, 2002).

1.5 Jarrah/Banksia woodland

1.6 Banksia woodland

1.7 coastal heath

Diagram 1.8 Photos showing changes over time with clearing for residential development in the suburb of Butler.
(Photo courtesy of Alice Stubber).

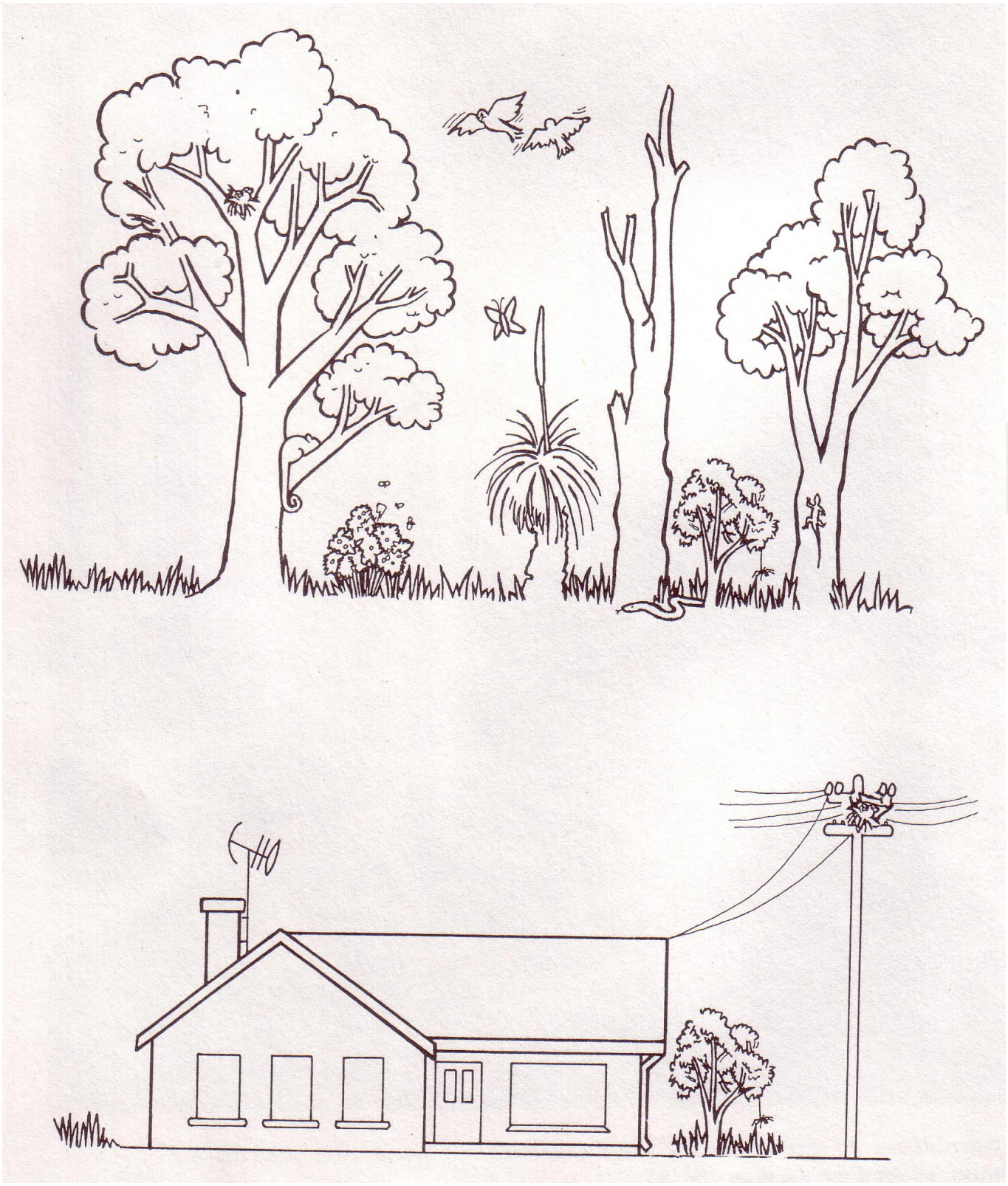


Diagram 1.9 Diagram showing changes over time
(Keighery, B & Huston, J 1994)