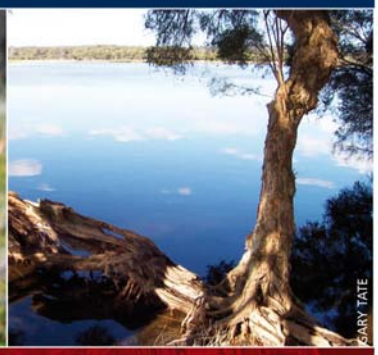
City of Wanneroo

Local Environmental Plan 2009-2014



2009-2014

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The City acknowledges assistance from the City of Wanneroo Environmental Advisory Committee, membership including:

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CONSULTATION

This document has been prepared in consultation with the City of Wanneroo Environmental Advisory Committee, representing the community on environmental matters, and following an eight-week public submission period.

Mayor's Message

The City of Wanneroo is one of the oldest local government areas within Western Australia and the fastest growing, with a current average growth rate of seven per cent per annum. Situated 22 kilometres north of Perth we dominate the northern corridor with an area covering 687.5 sq km and a unique landscape of more than 30 kilometres of coastline, large tracts of untouched bushland, State forest, wetlands, market gardens, and industrial, commercial estates, and residential estates.

Council faces the challenge of ensuring a balance between delivering new infrastructure for a rapidly growing community and protecting the environment for the future. The City's Local Environmental Plan (LEP) 2009 - 2014 identifies the major local environmental pressures facing our region and the strategic action to be taken to protect, manage and enhance the local environment in the future.

The LEP 2009 -2014 builds on the City's Local Environmental Strategy 2002 and brings strategies in line with current environmental issues and concerns facing Wanneroo. It has been developed through extensive consultation with community representatives on the City's Environmental Advisory Committee, and I thank everyone for their valuable contributions that will be fundamental to this strategy's success.

The LEP 2009-2014 has been designed to provide a range of environmental information for different interest groups with varying needs. It will be utilised by Council and community audiences and will help both parties protect the environment from the current pressures facing our landscape. Through the ongoing implementation of the LEP 2009-2014, the City is now providing specific sustainable directions for the broad range of the City's environmental action plans that are helping to secure our City's sustainable future.

JON KELLY
MAYOR

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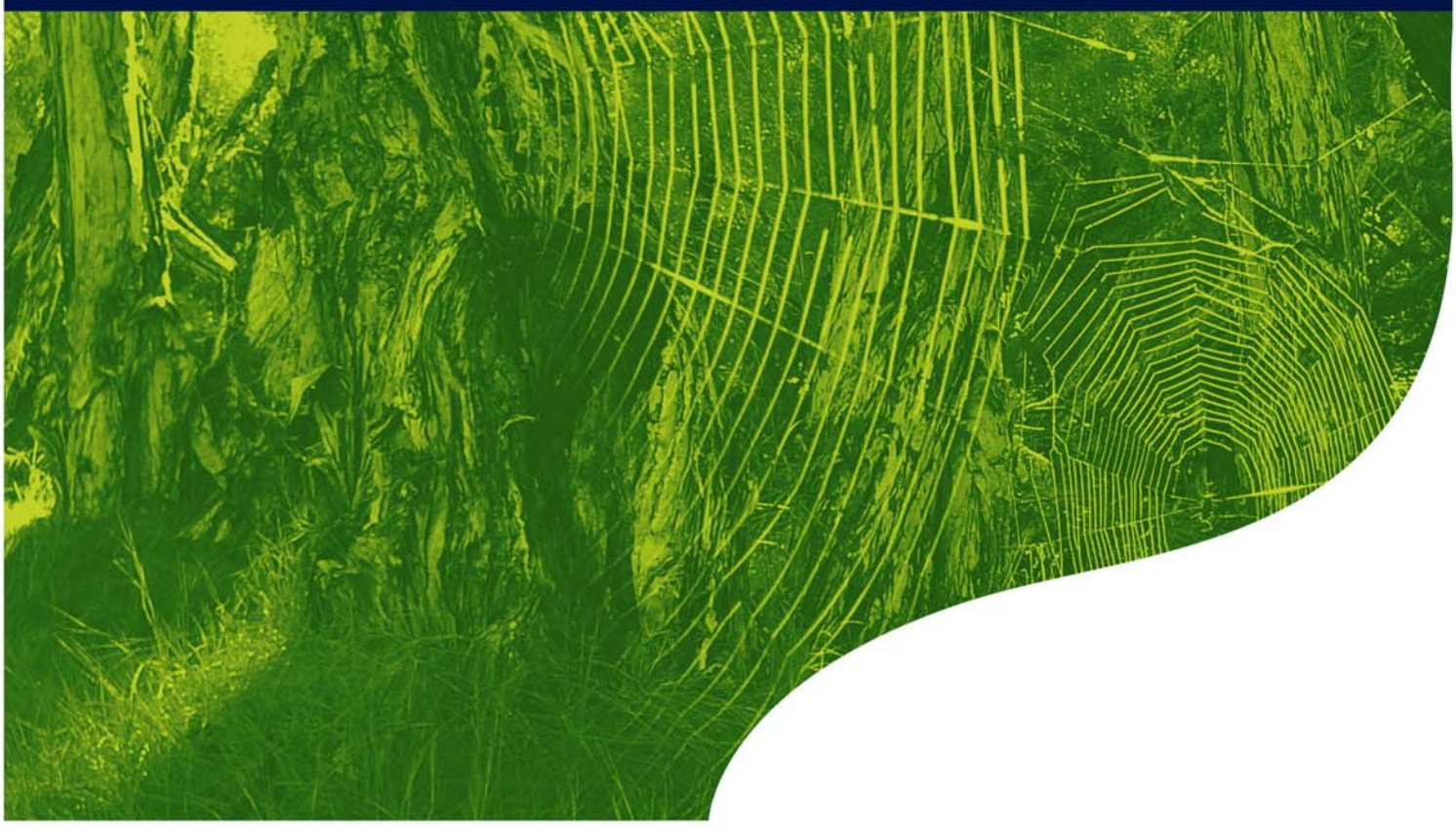
City of Wanneroo

PART I
Introduction



Background

PROTECTING THE ENVIRONMENT IS A RESPONSIBILITY SHARED BY GOVERNMENT AND THE COMMUNITY. WHILE ALL TIERS OF GOVERNMENT HAVE A ROLE TO PLAY IN LEADING BY EXAMPLE, LOCAL GOVERNMENT CAN WORK IN CLOSE PARTNERSHIP WITH THE COMMUNITY TO ACHIEVE ENVIRONMENTAL OUTCOMES.

The City of Wanneroo has an important role in environmental protection and is actively involved in:

- Working with the community to raise awareness of environmental issues
- Providing opportunities for community education
- Developing sustainable waste management options
- Supporting efficient use of water, energy and other resources
- Protecting local biodiversity and natural areas
- Developing partnerships to achieve better environmental outcomes
- Including environmental considerations in purchasing decisions
- Enhancing the natural environment of the City through effective land use planning and development control process
- Including environmental objectives in long term planning decisions

To guide environmental management across the City, Council adopted a Local Environmental Strategy on 15 October 2002 following extensive community consultation. The Strategy identified major environmental issues facing the City, and the actions needed to address them. To assist in its implementation, an Environmental Advisory Committee (EAC) was established to provide community input into ongoing reviews of the strategy.

The release of the Local Environmental Plan 2009-2014 (LEP) represents outcomes of a major review of the actions and achievements of the 2002 Strategy. The new LEP has been divided into three discreet parts:

- Part I – Introduction
- Part II – State of the Wanneroo Environment
- Part III – Local Environmental Strategy

Part I provides an introduction to the LEP. Part II provides information for the community on the local environment through a state of the environment (SoE), based on the framework used by the state government in the Western Australian State of the Environment Report (Environmental Protection Authority, 2007); our society causes environmental **pressures**, which affect the **state** of the environment, to which community and government develop a **response**.

Part III provides the City's response to environmental pressures, with policy-based strategic responses and key environmental projects that will be implemented. Part III also sets the scope for implementation, monitoring against strategic indicators, and review.

Purpose and Scope

THE LEP PROVIDES THE CITY'S STRATEGIC COMMITMENT TO ENVIRONMENTAL PERFORMANCE.

The LEP provides the City's strategic response to local environmental pressures. Strategies of the LEP provide the benchmark for operational plans, projects, and proposals. The intent of the LEP is to ensure that the City's operations meet the community's standards for environmental performance, and to effectively manage the impact and behaviour of those stakeholders whom the City can influence.

Key Stakeholders

PARTNERSHIPS ARE ESSENTIAL TO ACHIEVE ENVIRONMENTAL OUTCOMES, AND VITAL FOR THE CITY TO SUCCESSFULLY MANAGE THE WANNEROO ENVIRONMENT.

Key stakeholders are the people and organisations that have an interest and responsibility in environmental management, and with whom the City will partner in implementation of the LEP. Partnerships with key stakeholders can achieve better outcomes through sharing skills and resources for strategic planning and environmental projects on the ground.

Key stakeholders related to the environmental protection for the City of Wanneroo include:

- The Wanneroo community
- Western Australian Local Government Association
- Department of Environment and Conservation
- Western Australian Planning Commission
- Department for Planning and Infrastructure
- Department of Water
- Sustainable Energy Development Office
- Perth Region Natural Resource Management
- International Council for Local Environmental Initiatives (ICLEI)
- Mindarie Regional Council
- "Friends Of" groups
- Other local governments
- Other environmental groups

Local Environmental Themes

THE LEP HAS BEEN DEVELOPED TO ASSIST IN THE MANAGEMENT OF THE CITY'S ENVIRONMENT FOR THE BENEFIT OF THE WANNEROO COMMUNITY, AND TO MEET STATUTORY OBLIGATIONS AND COMMUNITY EXPECTATIONS.

The LEP identifies five key environmental themes.

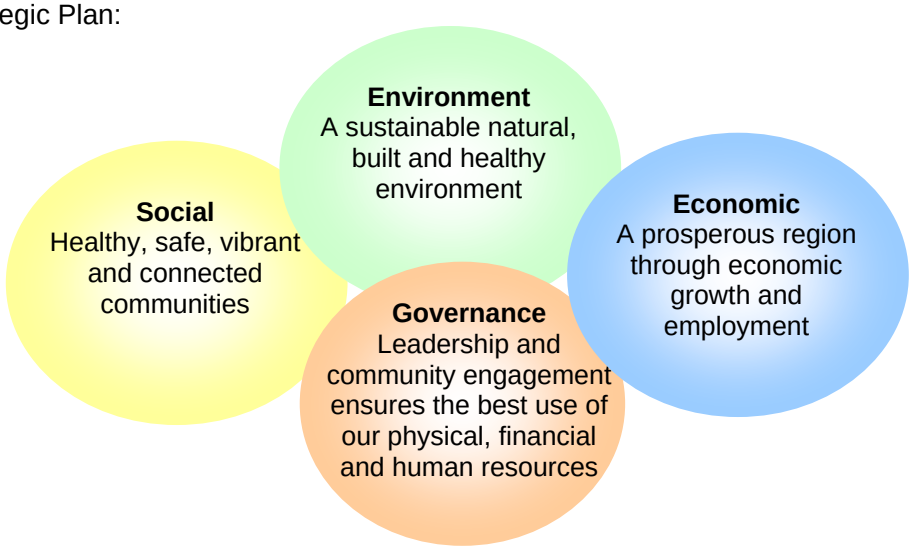
Ecosystems	Biodiversity Coastal Wetlands Geodiversity, including karst systems
Community	Environmental awareness & participation
Air Quality and Greenhouse	Air pollution Greenhouse emissions and climate change
Water Resources	Quantity and quality of drinking and environmental water
Sustainable Use and Waste	Sustainable production Waste management & recycling

Strategic Context

THE CITY IS COMMITTED TO SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL STEWARDSHIP, AND THIS IS EMBEDDED WITHIN THE CITY'S STRATEGIC PLANNING.

Strategic Plan

The City's vision to be "the centre for creative and sustainable growth, delivering strong, vibrant and connected communities" is supported by four pillars of the Strategic Plan:



The Local Environmental Plan 2009-2014 focuses on the pillar of providing a sustainable natural and built environment, and guides the City's activities for the protection and enhancement of the local environment.

Smart Growth

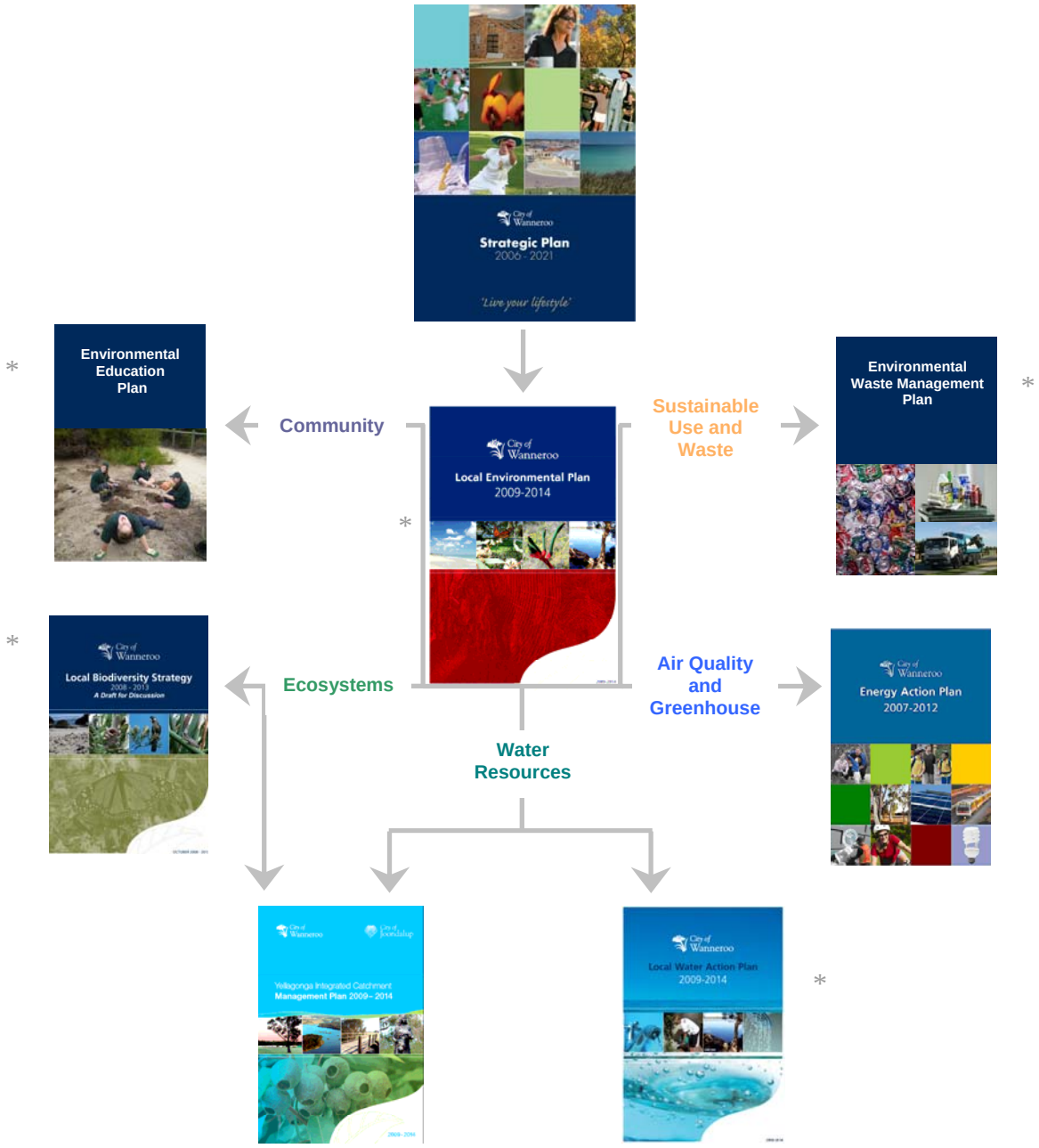
Smart Growth is a new way of thinking, seeking to manage growth more effectively to improve the outcomes of development for new and existing communities. The City's Smart Growth Strategy provides a foundation and action to balance growth by incorporating economic, environmental and social principles. The Smart Growth Strategy provides principles for development in the City; the Local Environmental Plan 2009-2014 focuses on Principle 3, and guides management of the environment through development processes.

Long term health of the environment

Smart Growth promotes development that minimises environmental impact, together with practices that conserve and enhance natural areas

Relationships to Council Policy

THE CITY'S LEP SETS ENVIRONMENTAL OBJECTIVES AND STRATEGIES, AND PROVIDES THE FOUNDATION FOR A RANGE OF ENVIRONMENTAL ACTION PLANS THAT IMPLEMENT THE LEP STRATEGIES THROUGH KEY OPERATIONAL POLICIES AND PROJECTS.

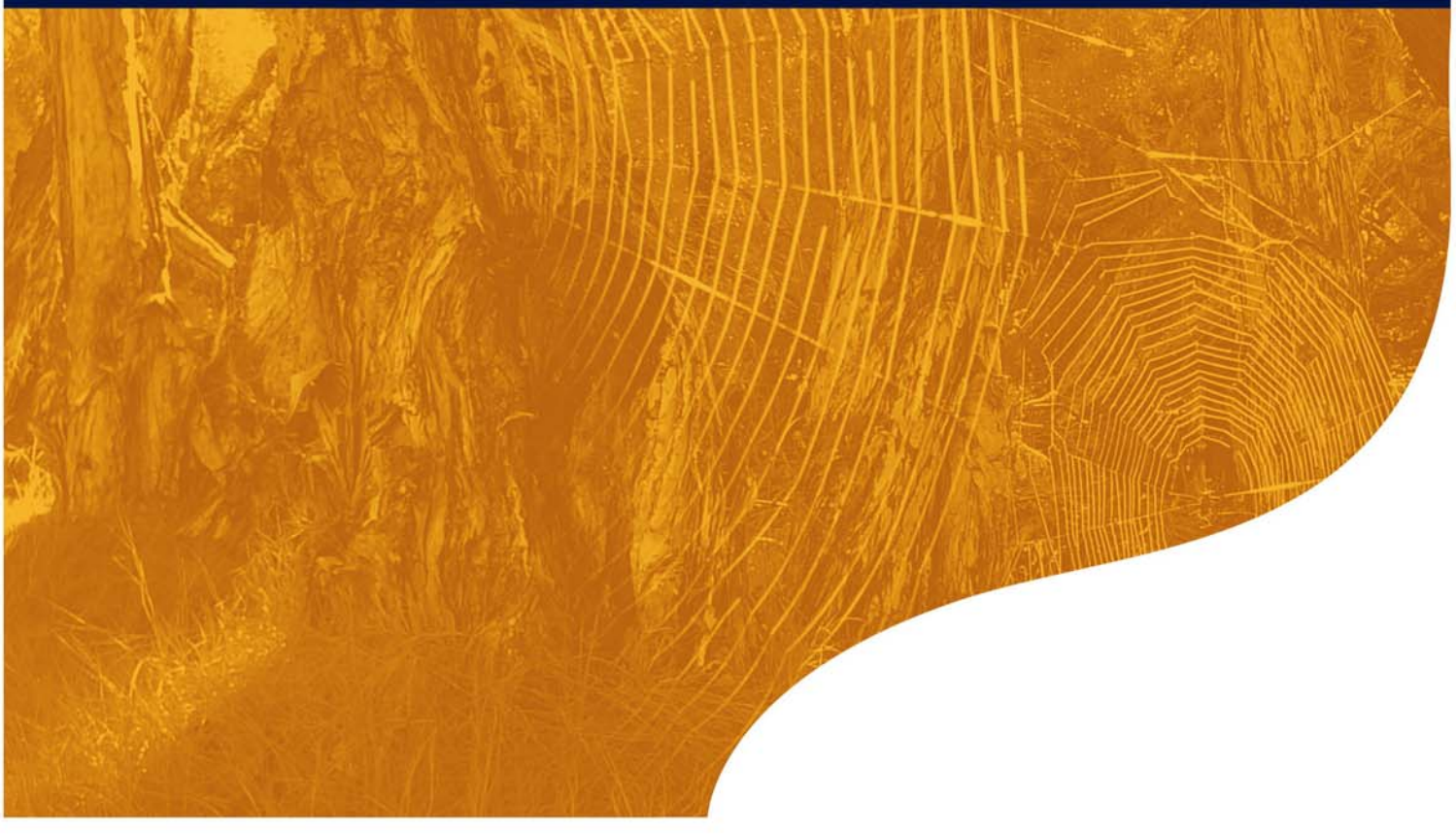


* Strategy in development at time of publication

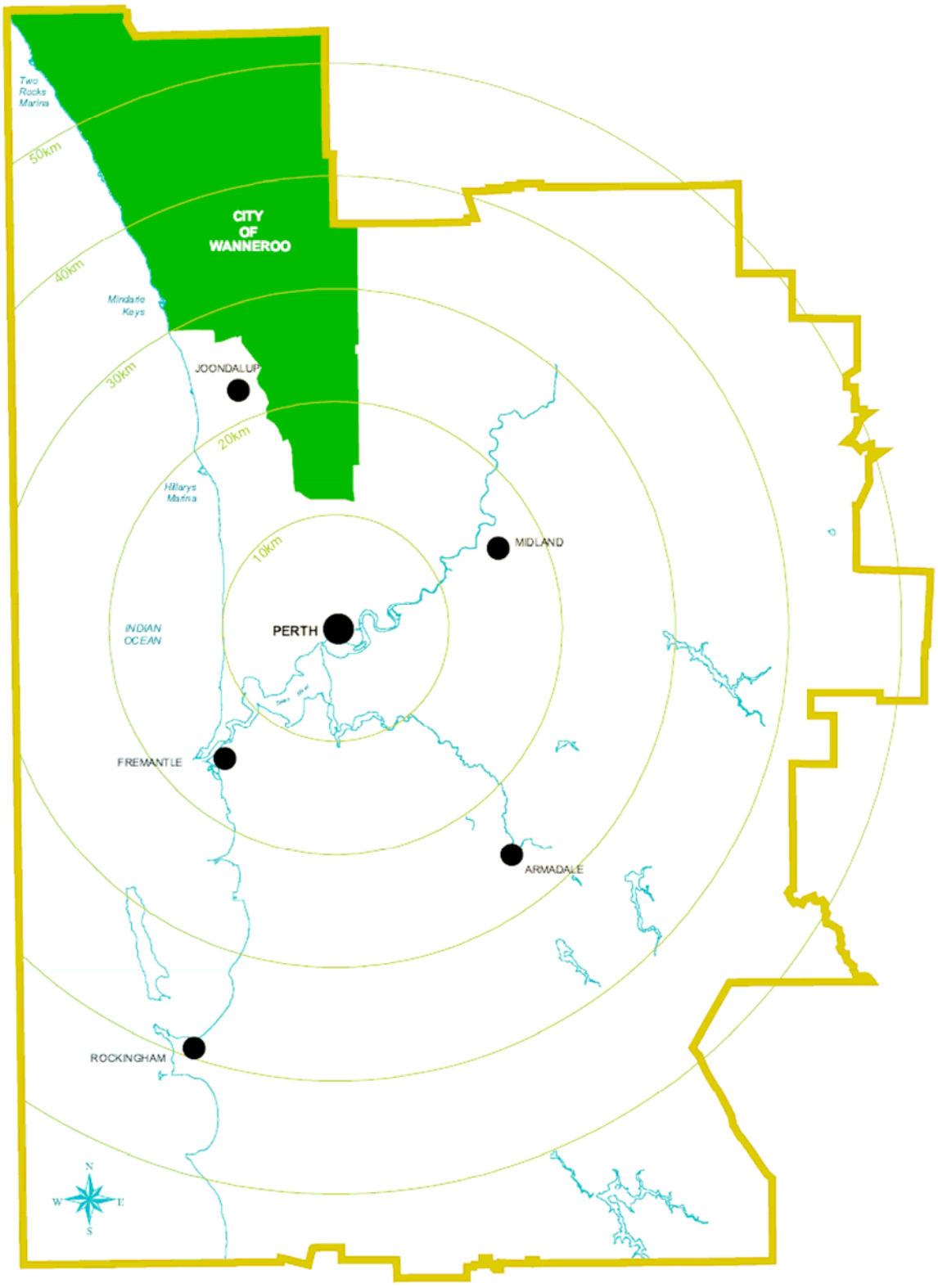
City of Wanneroo

PART II

State of the Wanneroo Environment




DAVE FIKE


Two Rocks Marina
50km
CITY OF WANNEROO
40km
Mindarie Keys
JOONDALUP
30km
20km
Hillarys Marina
10km
MIDLAND
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PERTH
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Introduction

THE CITY OF WANNEROO ENCOMPASSES AN ARRAY OF LANDSCAPES, INCLUDING OVER 32 KILOMETRES OF COASTLINE, LARGE TRACTS OF BUSHLAND, STATE FOREST, WETLANDS, MARKET GARDENS, INDUSTRIAL AND COMMERCIAL ESTATES, AND RESIDENTIAL ESTATES.

The City is located 22 kilometres north of Perth, covering an area of 687.5 square kilometres. The City stretches from Girrawheen and Koondoola in the South, to Yanchep and Two Rocks in the North.

The City's Natural Environment

Landform

The City is located on the Swan Coastal Plain, and contains a range of landforms that give Wanneroo its character, including lakes, forests, limestone hills, coastal dunes and both national and regional parks.

The variety of landforms in Wanneroo supports a range of ecosystems that provide habitat for a diversity of flora and fauna. These landforms and ecosystems are not only important for the biodiversity they contain, but also the sense of place they give to the community.



Soils

The City is located across three main dune systems that each have different soil characteristics: the Quindalup, Spearwood, and Bassendean Dunes (Macarthur and Bettenay, 1974).

The Quindalup Dunes are located adjacent to the coast across most of the City's length. These dunal soils are usually young, infertile sandy soils lying over older Tamala Limestone. Soils of the Quindalup dunes are free draining, and easily eroded by the wind.

The Spearwood dunes, located slightly more inland, are older than the Quindalup dunes. Soils here tend to be more fertile, consisting of yellow to brown sands overlying limestone.

The Bassendean dunes lie further to the east and are older again. There is no underlying limestone for these soils, which have been heavily leached of nutrients. The area is fairly flat and low lying, and contains a number of lakes and wetland areas.

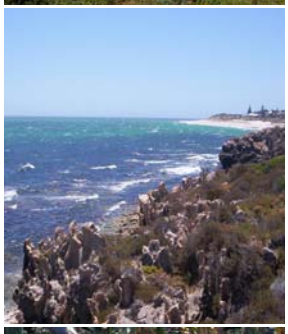


Coastline

The City's coastline stretches for 32 kilometres from Tamala Park (just south of Mindarie) in the south, to Two Rocks in the north. Wanneroo's coastal foreshore is relatively undeveloped, especially when compared to foreshores further south.

Wanneroo's coast represents important regional conservation value, providing an extensive ecological linkage characterised by coastal limestone cliffs and coastal heathland vegetation. The coastline also represents relict sand dune formations (the Quindalup dune system) occurring as beach ridges and a variety of dune types.

Surface Water


Throughout the City, wetlands have developed where the surface of low-lying land crosses seasonal groundwater tables (Balla, 1994). The City has a chain of linear lakes, including Lakes Joondalup, Goolellal, Nowergup, Neerabup and Carabooda, and a chain of circular lakes, including Lakes Gnangara, Pinjar, Mariginiup and Jandabup.

The City has a range of wetland ecosystems including permanently inundated lakes, seasonally inundated swamps and seasonally waterlogged damplands. These wetlands provide important habitat for a diversity of fauna, the most visible being water birds.

Groundwater

The depth to the groundwater underlying the City changes across the landscape. The depth to the water table is fairly stable for three to four kilometres in from the coast, rising sharply immediately east of the linear lakes. This is related to the contact between limestone and sand, through which water flows at different speeds (WAWA, 1986 cited in Bowman Bishaw Gorham, pg 36, 1994).

An important groundwater resource in the City is the Gnangara Mound; a large source of water used for public and private supply. This good quality groundwater is generally unconfined, fresh and easily accessible, usually at depths up to 50 metres below the surface (Water and Rivers Commission, 1997 cited in WRC, 2004).

The Gnangara Mound is bounded by Gingin Brook and Moore River in the north, Ellen Brook in the east, the Swan River in the south and the Indian Ocean to the west. It is a vital groundwater resource and, together with the Jandakot mound, provides approximately 50 percent of Perth's public drinking water supply (WAPC, 2005).


Two Rocks Marina
YANCHEP-TWO ROCKS
ALKIMOS-EGLINTON
JINDALEE
BUTLER
QUINNS ROCKS
MERRIWA-RIDGEWOOD
CLARKSON
MINDARIE-TAMALA PARK
Mindarie Keys
NORTHERN RURAL
BANKSIA GROVE
CARRAMAR
SOUTHERN RURAL
INDIAN OCEAN
TAPPING-ASHBY-SINAGRA
HOCKING-PEARSALL
DARCH-MADELEY
WANGARA-WOODVALE
LANDSDALE
ALEXANDER HEIGHTS
MARANGAROO
GIRRAWHEEN
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Flora

The City is located within the South West Australia Global Biodiversity Hotspot, and contains a vast area of important vegetation that has local, regional, national and even international significance. The vegetation within the City includes species and communities that are found only in a restricted part of the southwest of Western Australia. Some vegetation types in Wanneroo, for example, are only found within the City, or represent the best remaining examples in Western Australia (Trudgen, 1996)

Of the 15 vegetation complexes on the Swan Coastal Plain, 11 occur in Wanneroo, highlighting the diversity of habitat that characterises the City's environment (WALGA, 2004).

Karst Features and limestone caves



Karst features are a key environmental characteristic in the City due to the distribution of Tamala limestone; a porous rock that can be slowly dissolved by weakly acidic waters, such as groundwater or rainfall. This process is known as karst weathering, and results in a number of landform features including sinkholes, caves, dry valleys, tube structures and vaults (Geoscience Australia, 2003).

The distribution of Tamala Limestone in Western Australia shows a karst belt, crossing the City's area five kilometres inland from the coast which is represented by numerous lakes and caves, for example those at Yanchep. Caves themselves are important scientific and cultural components of natural landscapes.

The presence of karst features in the City's landscape increases landform diversity, and supports a greater level of biodiversity. The City's karst features, however, are at risk from, and can pose risk to, growing urban development. Development can affect the integrity of important karst features, whilst the inappropriate location of roads or houses over caves and pinnacles present risk to public safety and built structures.

Subterranean Fauna

Some of the caves in Wanneroo contain fauna that are specially adapted to living in the cave environment, called Troglobitic fauna. The most sensitive of these are stygofauna, which live in groundwater. Stygofauna include different types of crustaceans, and also worms, snails, insects, and other invertebrate groups. Most species spend their entire lives in groundwater and are not found in any other location (Jasinska, 1997).

A number of underground caves in Wanneroo support critically endangered aquatic root mat communities, formed by the roots of Tuart trees in contact with cave streams, which are protected under the Federal Government's *Environmental Protection and Biodiversity Conservation Act 1999*.

The City's Built Environment

Historical and Current Land Use

The City of Wanneroo was originally settled by market gardeners seeing the potential of the extensive wetland system in the area. Later land uses in the City included limestone quarries and their associated limekilns. The Dongara to Fremantle stock route also ran through Wanneroo, using the lakes as watering holes along the way. These activities not only led to the City we know today, but also provided the foundation for the current mosaic of development and remnant bushland.

The City's urban areas vary in age. Early settlement areas of the Wanneroo town site, Girrawheen and Koondoola were developed around 1970 with the arrival of the main Perth urban development front. Now, the City is one of the fastest growing in the country, with new urban areas being developed in the coastal urban corridor and east of Wanneroo Road.

Overall, the City has a diverse range of land uses, with housing and industry, small to large areas of native vegetation, agriculture and state forest.

High Growth

The City is experiencing significant population and urban growth, with the 2006 population of 117,409 forecast to grow to just over 161,578 by 2011 and 250,491 by 2021 (Informed Decisions, 2008). In terms of development, the growing population forecast represents an average annual growth of almost 2,350 new households, or roughly 45 new households per week, between 2005 and 2011.

Transport Networks

The predominant transport corridors in the City are road networks that run in a north south direction: principally Wanneroo Road and Marmion Avenue. The public transport service network is average and this is worsened by the decentralised spread of population. There are poor transportation routes to major industrial areas that give rise to accessibility issues.

Environmental Indicators

The State of the Wanneroo Environment utilises a range of indicators to assist the City to track changes in the local environment when undertaking regular reviews. The indicators have been designed, where possible, to measure factors that the City can directly influence and easily measure. The information and indicators within the State of the Wanneroo Environment have been researched and identified to provide an easily updateable summary on the local environment; greater detail and monitoring of issues is provided by the more specific environmental documents and action plans listed in Section 2.3 of Part I.



Ecosystems

THE ECOSYSTEMS OF WANNEROO INCLUDE OUR COASTS, WETLANDS, BUSHLAND, CAVES AND KARST SYSTEMS, AND AGRICULTURAL LAND. INCLUDED WITHIN LANDSCAPES IS OUR BIODIVERSITY, WHICH EXISTS IN BUSHLAND AND NATURAL AREAS, AND THE QUALITY OF OUR LAND AND SOILS, WHICH ARE IMPORTANT FOR LOCAL AGRICULTURE.

Human activities such as development, pedestrian and vehicle use and the increased occurrence of fire, are threatening our ecosystems and reducing the capacity for these areas to absorb impacts. These pressures are particularly prevalent in the City of Wanneroo given it is one of the fastest growing population centres in Australia.

Pressures

Major pressures on ecosystems within the City of Wanneroo are:

- Development
- Clearing and fragmentation
- Weeds
- Fire
- Domestic and feral animals
- Spread of pathogens
- Uncontrolled access
- Dumping
- Climate change
- Contamination

Development pressure is a key threat to natural ecosystems and the biodiversity they support.

Development

Wanneroo is one of the most rapidly developing areas in Western Australia with large areas of natural vegetation being cleared to make way for new development. This places increasing strain on local biodiversity, coastal areas, wetlands, caves, and karst features.

From the original pockets of habitation in a bush landscape, the City of Wanneroo is rapidly moving towards islands of bushland in a sea of urbanisation. This can easily lead to isolation of the remaining 'natural' areas, unless the City's longer-term development plans look to maintaining and reinforcing links between these reserves.

On the coast, dune systems are fragmented by developments such as car parks, roads, marinas/groynes, access paths and buildings. In some areas there are buffers, however in more built up areas, the developments occur on the primary dune.

The loss of dunes due to beachfront development can pave the way for severe erosion during tidal surges and storms, and the loss of native plant and animal life. In addition to the environmental impacts, these developments can be severely damaged themselves during storm events, due to sand below the structures being eroded away.

Development pressure does not only impact upon natural diversity; areas currently utilised for horticulture in the City, including market gardens, are under pressure to urbanise. Increasing urbanisation decreases the land available within the City to provide food for the community. Also, impacts do not only arise from clearing; infrastructure to facilitate new urban development can also impact. For example, inappropriate planning of stormwater systems can lead to runoff directed into underground karst features and caves causing their degradation.

Clearing and Fragmentation

Clearing across landscapes directly impacts on ecosystems with a direct loss of plant and animal species and destruction of habitat (SWAEI, 2006), and also leads to habitat fragmentation. Within fragmented landscapes, ecosystems face additional degradation due to the often small and irregular pockets remaining. 'Edge effects', such as weed invasion, are more pronounced on the edges of bushland, and the smaller the area the greater the effect.

Fragmentation reduces the quality of habitat for individual species and isolates the species that live in an area. The ability of native animals and plants to disperse across landscapes is affected, as is the ability of populations to re-colonise areas after a disturbance (PBP, 2004). This generally results in the continuing loss of species across the wider landscape long after land is initially cleared (SWAEI, 2006).

Weeds are a key management issue for the City's bushland and threaten the natural biodiversity values they contain.

Weeds

Weed invasion within the City of Wanneroo's natural areas varies to a great degree depending on past usage, past and present disturbance factors, fire frequency and surrounding land use (CoW, 2003).

Weeds are a major issue for the City's bushland, wetlands, and coastal dunes and can become established through natural dispersal mechanisms such as being carried by the wind or via birds. Weeds can also become established wherever the environment is disturbed or altered, such as access for people, vehicles and animals or from landscaped environments. Dumping of garbage refuse, poorly sourced mulch, and/or poorly sourced plant species also contribute to the introduction of many weeds to the City's natural areas (CoW, 2003).


Fire

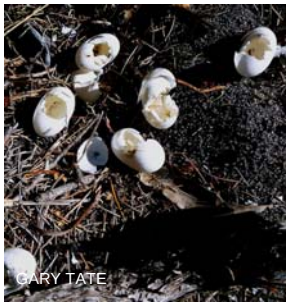
Many bushland sites, especially those in suburban settings, show signs of regular small-scale burns. There is no doubt that although fire in our bushland was part of nature and caused massive germination of seed, its current frequency in urban bushland is destroying biodiversity and encouraging weed invasion (SWAEI, 2006).

Fire can play an important role in the regeneration of Tuart trees, but can also destroy the resulting trees before they are old enough to survive. Some research shows that it takes around 16 years between fires to replenish the seed store (Tuart Response Group, *pers. comm*). With the current fire frequency in many of our urban bushlands, the seed store is never replaced, so Tuart numbers are declining.

Coastal areas are particularly vulnerable to degradation following fires. The typically sparse nature of coastal vegetation, negligible nutrient storage in the soil, the low moisture content of coastal sands and strong on-shore winds can make plant establishment following fires very difficult.

Many natural reserves are located adjacent to residential areas, so the risk of wildfire causing injury or loss of property is high, and can result in community pressure to undertake regular controlled burns. However, fires that occur too frequently can deplete regenerative plant stocks, change the structure of plant communities, and leave the area susceptible to weed invasion and erosion (CoW, 2003).

European honeybees often construct hives in tree hollows which reduces habitat for native birds; foxes are taking a high toll on tortoise breeding by excavating and predating on eggs around wetlands; the European rabbit is a significant threat to germination of native seedlings



Domestic and feral animals

Some domestic animals, particularly unleashed dogs, can have a considerable impact in some reserves due to relatively large numbers being exercised and the potential for unleashed animals to chase and harass native animals. Domestic cats are also known to affect wildlife populations when left to roam in natural areas. Across the City, foxes are a key threat, taking long-necked tortoise eggs around wetlands, as well as young kangaroos, wallabies and bandicoots in dryland reserves (CoW, 2003). Feral animals can also have a significant impact on native wildlife aside from predation; feral bees often build hives within tree hollows that would usually provide breeding habitat for native cockatoos.

The European Rabbit (*Oryctolagus cuniculus*) poses the biggest threat within coastal and agricultural areas. This species is abundant in the coastal heath near Burns Beach, and presents a significant threat to the germination of seedlings, particularly if a fire were to occur in the area. Currently rabbit control is limited to Pindone baits and rabbit-proof fencing surrounding areas where rabbits have been removed. However, in some areas the use of Pindone baits may not be appropriate, particularly where domestic pets or non-target native fauna can be affected.

Spread of pathogens

Dieback (*Phytophthora cinnamomi*) is the most widely known pathogen of WA's bushland. Although it is not common on the soils of the western coastal plain, the wetter, more acidic Bassendean Sands suit its spread. Often introduced in mud or dirt from vehicles or equipment, the pathogen spreads through the soil via groundwater flow.

Dieback is known to be present in bushland to the east of Lake Gnangara and also around the eastern fringe of the Lake. It has likely been introduced and spread by off road vehicles (ATA Environmental, 2002). Dieback is also likely to affect Pinjar Park.

Uncontrolled access

With the rapid urbanisation of Wanneroo, trail bikes and four-wheel drives are becoming major problems for natural areas. People use vehicles in bushland or along the coast for transport, recreation or as part of other activities such as fishing, camping, or boating.

Vehicles in bushland, dunes, and above the high-tide mark on the beach can cause significant damage to landscapes through physical removal of remaining vegetation, soil compaction, introduction of dieback, soil disturbance, and the creation of blowouts and sand sheets. Other impacts include disturbance to fauna such as ground-nesting birds, including Hooded Plovers, Little Terns and Fairy Terns, which nest in dunes and on sandy beaches. Vehicles also create safety issues and affect the recreation experience of other users (PBP, 2004).

Uncontrolled pedestrian movement within natural areas can trample fragile vegetation, disturb the soil surface, and leave the area prone to erosion. In addition to physical damage and loss of biodiversity resulting from excessive tracking, there is a significant reduction in the aesthetic value of landscapes where access is uncontrolled.

Uncontrolled access in cave and karst areas is also a key concern, due to potential damage to these areas, and potential risk of injury.

Dumping of waste in bushland areas is a key management threat

Dumping

The long-term use of natural areas for dumping stolen and wrecked cars, household rubbish, garden rubbish, white goods and asbestos fencing is very high in a few areas of the City. A lack of fencing and signage advertising the purpose of bushland has contributed to this problem (CoW, 2003).



Climate Change

In Australia, ecosystems have evolved to cope with our unique climate and environment. The pressures of a changing climate present significant threat to the ecosystems of Wanneroo. Not only will climate change directly affect natural areas, but impacts will also worsen other pressures, for example weeds and feral animals (Pittock, 2003).

Key likely impacts of climate change on the ecosystems of Wanneroo include:

- Increased number and range of weedy species and animal pests
- Shifting climate zones affecting ecological niches of flora and fauna
- Changes to vegetation, affecting the quality and quantity of habitat for fauna and increased incidence and intensity of fires
- Drying of wetlands from changes in water flow and increased evaporation
- Impacts on coastal landscapes due to sea level rise, and increased erosion due to more frequent storm events and surges

Contamination

Soil contamination is a major threat to the use of land, and can have significant effects on nearby ecosystems due to potential for groundwater contamination. Potential health impacts of contaminated land are also a concern, with potential harm to human health if sites are not properly managed or remediated (EPA, 2007). Within the City, past land uses have had the potential to contaminate soils. These include market gardens, decommissioned service stations, and land uses that involve application or storage of chemicals.

State

The City of Wanneroo encompasses 68,750 hectares of land in the northwest corridor of Perth – one of the most biologically diverse cities in the world. Of this, approximately 31,000ha are vegetated with native flora across bushland, coasts, and wetlands, making the City of Wanneroo a very unique place to live, work and recreate.

Although some of our natural areas are protected using methods such as reservation in Regional Parks, clearing for future urbanisation and more intense development currently threatens the remaining 10,025ha of unprotected areas.

Increasing protection of ecological communities that are currently protected below 30% of their original extent will be an important focus of the City's Local Biodiversity Strategy together with the preservation of specific natural features. Protection of ecosystems through the City's Local Biodiversity Strategy is further supported by the City's efforts to manage natural areas through development and implementation of management plans. Protection and management will not only help protect the City's ecosystems, but will also preserve the unique Wanneroo environment.

Ecosystems Indicators

(1) Area of natural vegetation protected within local or regional reserves

139 hectares of mapped native vegetation has been included within local reserves, being zoned for Parks and Recreation (Local Scheme Reserves) under the City's District Planning Scheme No 2 (DPS2).

7,571 hectares of mapped native vegetation has been included within regional reserves, being zoned for Regional Parks and Recreation under DPS2 (WALGA, 2008).

(2) Number of natural reserves identified as having local or regional conservation significance recognised as such

The vested purpose of three reserves within the City formally recognises the conservation significance of the areas.

- Koondoola Regional Bushland, with a vested purpose for conservation and recreation
- Lake Joondalup Nature Reserve, with a vested purpose for recreation and conservation of flora and fauna
- Orchestra Shell Reserve, with a vested purpose for the protection and preservation of Orchestra Shell Cave


DAVE PIKE


GARY TATE

(3) Number of City managed natural reserves identified as having local or regional conservation significance with management plans

Thirteen reserves with identified conservation significance have current management plans.

- Gnangara Lake Management Plan 2002-2007
- Koondoola Regional Bushland Management Plan 2008
- Yellagonga Regional Park Management Plan 2003-2013 (DEC, includes three City reserves)
- Tamala Park Bushland Management Strategy 2003
- Montrose Conservation Reserve Management Plan 1995
- Highview Park Management Plan 1995
- Marangaroo Conservation Reserve Draft Management Plan 1990
- Orchestra Shell Reserve Management Plan 1998
- Kinsale Conservation Reserve Management Plan 1995
- Yanchep Lime Company Carabooda Kiln Site Conservation Plan 1998

(4) Percentage area of Threatened Ecological Communities protected within local or regional reserves

Of the 3245 hectares of known Threatened Ecological Communities (TEC), 90 percent (2,918 hectares) is protected within local or regional reserves.

(5) Percentage of areas of known habitat for rare species protected within local or regional reserves

A number of rare fauna species utilise most vegetation within the City of Wanneroo. Of the remaining 31,612 hectares of native vegetation remaining, 24 percent (7710 hectares) is formally protected habitat for local fauna.

(6) Area of land zoned for agricultural uses within the City

Land within rural zones is available for small to larger scale agricultural enterprises and represents the land available to provide food and resources for our community. Within the City, market gardens are an example of productive horticultural uses.

Rural resource zone	4,050 hectares
General rural	5,832 hectares
Special rural	1,394 hectares
Rural community	494 hectares
Total	**11,770 hectares**

Current Responses

The City has undertaken considerable work already to better protect ecosystems. The City regularly develops and reviews management plans for natural areas, and implements a significant conservation maintenance program.

Another key activity in this area has been participation in the Perth Biodiversity Project, a local government initiative to improve the conservation of natural areas throughout the Perth Metropolitan Area. Key outcomes of participation in the Perth Biodiversity Project leading to the development of a Local Biodiversity Strategy for the City, include:

- *2003 Bushland Assessment Report: Identification, Biodiversity Assessment and Prioritisation of Bushland Managed by the City of Wanneroo* which provides the basis for protection of natural assets managed by the City
- *City of Wanneroo Local Biodiversity Strategy* that provides a framework to enable the City to protect biodiversity values on public and private land

Another response to better manage local landscapes is the Yellagonga Integrated Catchment Management Project. The Project is working to develop a three-way management strategy by the City of Wanneroo, City of Joondalup, and Department of Environment and Conservation to improve the health of the Yellagonga Regional Park by addressing the sources of the park's health problems.

Community

ENVIRONMENTAL GOALS CANNOT BE ACHIEVED THROUGH THE ACTIVITIES OF GOVERNMENT ALONE; THE ACTIVITIES OF COMMUNITIES ALSO AFFECT THE LOCAL ENVIRONMENT IN BOTH POSITIVE AND NEGATIVE WAYS. ENVIRONMENTAL OUTCOMES REQUIRE THE SUPPORT OF AN ENGAGED COMMUNITY THAT IS AWARE AND PARTICIPATING IN ENVIRONMENTAL ACTIVITIES.

The City has an important role in supporting greater awareness of the community in environmental action. Increasing the community's knowledge and understanding of environmental issues through education can lead to increased levels of participation in environmental initiatives and result in a healthier environment.

Pressures

The ability of the community to be engaged in environmental action is affected by:

- Awareness – general knowledge and understanding of environmental issues throughout the community
- Participation - skills, expertise, and level of participation in 'on-ground' activities



Awareness

An aware community enables a sustainable community. Many environmental issues, for example climate change and water shortages, require action by individuals and communities if they are to be addressed. Changes in perception and behaviour required cannot be achieved without awareness of these issues throughout the community. For example, greater awareness regarding water and energy is resulting in the community rethinking their use of these limited resources, and changing behaviour for a sustainable future.

Governments, especially local government, have an important role in promoting environmental awareness within their communities, including the public, schools and universities, and local business.

Participation

Local government has limited resources to direct to onground environmental management. The community, therefore, is a valuable resource for the implementation of many on ground activities through voluntary efforts. Volunteer efforts not only result in better environmental outcomes, but also the time donated to serve the community also provides added benefits by fostering a strong sense of ownership and community pride.



Community participation levels are influenced by a number of issues with the result that only a small percentage of the community contributes to the majority of effort. These pressures should be addressed to improve the number of community members becoming involved in protecting and managing the environment. Issues affecting community participation include:

- Other priorities and commitments
- Lacking knowledge of how to get involved
- Limited understanding of the community's role in environmental management
- Perceived lack of skills and talents
- Perception that would be volunteers are either too old or too young

The motivation levels of volunteers already involved in community groups can be hindered for many reasons. These reasons may be attributed to social dynamics within groups such as:

- Groups relying entirely upon the enthusiasm and direction of key individuals, without which they may become inactive
- Limited funding and resources to be effective
- Perceived lack of support particularly, administration assistance, and coordination with Government activities
- Lack of recognition for contribution
- The levels of input from individual volunteers varies according to age and personal commitment
- Lack of diversity of skills and expertise such as project planning, applying for funding, budgeting and administration and practical skills



State

The City of Wanneroo maintains a Community Information Database with over 500 registered community groups. There are a number of active environmental groups committed to protecting the City's unique local environment. These groups provide a structured forum in which individuals can become involved in helping to protect the environment within the Wanneroo area.

Environmental Groups in the City usually consist of a few people working together to care for a bushland reserve. These groups work in their own time and at their own pace and are eligible for assistance from the City of Wanneroo. The groups are involved in projects such as:

- Guided nature walks
- Environmental awareness-raising
- Environmental monitoring
- Restoration and rehabilitation work
- Seed collection
- Dune stabilisation
- Rubbish collection
- Weed control
- Designing walk trails
- Conducting vegetation surveys

The City appreciates the value of community volunteers, and recognises their efforts through awards and volunteer celebrations. A number of local schools also work with the City, to provide environmental education to students in the area.

Community Indicators

(7) Number of environmental based community groups and Friends groups in the City of Wanneroo

There are eight existing local environmental based community groups in the City of Wanneroo, actively involved in environmental work. These include:

- Friends of Yellagonga Regional Park Inc
- Friends of Koondoola Regional Bushland
- Quinns Rocks Environmental Group
- Friends of Landsdale Park
- Friends of Marangaroo Conservation Reserve
- Lake Neerabup Rural Group Inc
- Friends of Belgrade Park
- Mercy College Environmental Project Group

(8) Number of community members attending environmental events

In 2007-2008, a total of 1,097 community members attended 55 environmental events hosted by the City, including Great Gardens workshops, and seminars for Conservation Week.

(9) Number of schools participating in environmental education programs

In 2007-2008, eight schools participated in environmental programs and events coordinated by the City, involving 148 students in environmental education.

Current Responses

The City has worked with the community to increase awareness and participation through the Environmental Advisory Committee, Awards for Environmental Excellence, bushcare groups network with a dedicated conservation officer, community activity programs, Conservation Week events and an annual recognition of volunteers event.





Air Quality and Greenhouse

OUR ATMOSPHERE IS AN IMPORTANT NATURAL RESOURCE. IT PROVIDES THE AIR WE BREATHE, AND THE CLIMATE THAT SUSTAINS OUR SOCIETY. HOWEVER, IT IS ALSO A RESOURCE THREATENED BY AIR QUALITY EFFECTS, AND THE IMPACTS OF THE ENHANCED GREENHOUSE EFFECT, CONTRIBUTING TO CLIMATE CHANGE.

Air quality and Greenhouse are difficult issues to address at a local scale, as the impacts reach beyond the border of the local government, and the actions of those outside the City can cause impacts within the local area. However, the City and community minimising our impact on air quality and greenhouse will contribute to larger efforts to reduce climate change and air quality issues.

Pressures

Particulate pollution



In Perth through winter, there are occasional days where haze reduces visibility. This haze is a result of small particles in the air, due to a range of factors including smoke, industry, and transport (DEC, 2007). These pollutants have been linked to significant health impacts and are known to result in higher levels of hospitalisations due to respiratory conditions and asthma (DoE, 2003).

A range of natural and human induced causes produces particulates that contribute to air quality issues. Natural sources include fine soil particles and smoke particles from bushfires. Human activities that contribute to particulate pollution include combustion processes in vehicles, particularly diesel-fuelled vehicles, industrial and commercial boilers and incinerators, power generation, domestic wood heaters, and burning off refuse or vegetation for bushfire prevention of clearing agricultural stubble (DEC, 2007).

Within the City, a number of factors contribute to particulate pollution across the Perth Metropolitan Region. These include bushfires, fuel usage, inefficient or inappropriate use of domestic wood heaters, and some industry.

Greenhouse emissions

The link between greenhouse gas emissions, including carbon dioxide, and a changing climate are now widely known and accepted, and the scientific community agrees that we are currently experiencing and will continue to experience a changing climate (Pittock, 2003). Significant action is required to keep the extent of climate change within a range that will allow our society to adapt.

Many activities within Wanneroo contribute to climate change (CoW, 2007a), including: use of electricity generated from fossil fuels, fuel usage, release of methane from landfill, and clearing of native forests and bushland.

State

The Department for Environment and Conservation monitors ambient air quality against nationally agreed standards under the Ambient Air Quality National Environment Protection Measure (NEPM) and other standards established by the Environmental Protection Authority. Air quality monitoring indicates that air quality in the region is in line with current standards and guidelines (DEC, 2008).

The City of Wanneroo joined the Cities for Climate Protection (CCP™) program in 2003 in order to reduce its greenhouse gas emissions. The City has committed to reducing per capita emissions from its own operations by 25 per cent from 2002 levels, and per capita community emissions by 20 per cent from 1996 levels by 2012.

Air Quality and Greenhouse Indicators

(10) Percentage of Wanneroo residents using public transport or other sustainable methods of travelling to work

9.02 percent of Wanneroo residents are utilising public transport or other sustainable methods of travelling to work, with over 90 percent of residents utilising private cars on a frequent basis (ABS, 2008).

(11) Number of days where the NEPM standard for ambient inhalable particles is exceeded

The NEPM sets standard concentrations for inhalable particles that are not to be exceeded more than five days per calendar year. From July 2007 to June 2008, only one day exceeded the standard in April 2008; this was attributed to a local bushfire (DEC, 2008).

(12) Total corporate greenhouse gas emissions saved through energy reducing activities (tonnes per year)

In 2006/07 the City reported an abatement of 438 tonnes of greenhouse gas emissions in the corporate sector (CoW, 2007b).

(13) Total community greenhouse gas emissions saved through energy reducing activities (tonnes per year)

In 2006-2007, the City reported an abatement of 32,645 tonnes of greenhouse gas emissions in the community sector (CoW, 2007b).

Current Responses

The City's primary response with regard to Air Quality and Greenhouse is the Cities for Climate Protection Program, supported by the International Council for Local Environmental Initiatives (ICLEI). The City has undertaken an inventory of greenhouse gas emissions from corporate activities, set corporate and community goals to reduce emissions, and is implementing actions to achieve these goals, guided by the Energy Action Plan.



Water Resources

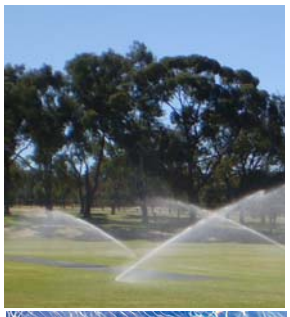
WATER IS OUR MOST IMPORTANT RESOURCE. IT IS VITAL TO OUR SURVIVAL, AND THAT OF OUR ENVIRONMENT. WISE USE AND MANAGEMENT OF OUR WATER IS ESSENTIAL IF WE ARE TO PRESERVE OUR BUSHLAND AND WETLANDS, AND MAINTAIN OUR HIGH STANDARD OF LIVING.

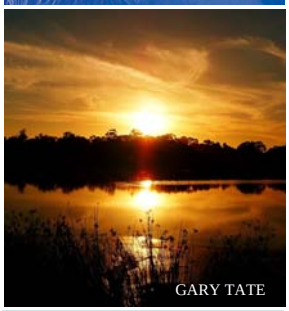
Not only is decreasing rainfall and a growing population putting pressure on our drinking water, but expanding urban development and other land uses are having significant impacts on our water environments.

Pressures

Key pressures on our water quality and quantity include:

- Climate change
- Population growth and overuse
- Changing land use
- Stormwater
- Contamination





Climate Change

Perth is getting drier. With the current trend of less rainfall extending back to the 1970s, there has been less water entering Perth's dams, and less water recharging our groundwater systems (IOCI, 2006). Limited water resources, due to a changing climate, will affect agricultural and horticultural activities, prevent widespread irrigation of public places, and have severe impacts on water dependant landscapes, particularly wetlands.

Population Growth and Overuse

Western Australia's population has grown by 1.7 percent each year for the past decade, which is a growth rate 30 percent higher than the national average. The City's population is following a similar trend (ABS, 2007). With our growing population and limited, decreasing water resources, it is clear that Perth will face a water shortage in the future. Water shortages will have significant impacts on our lives, homes, and landscapes.

The rate at which we utilise our water resources also places pressure on our water supply. Inefficient use of water, for example overwatering gardens and landscapes, and inefficient water appliances, contribute to water shortages. It is important that water is used wisely, to enable enough water to maintain our standard of living and support our environment (DPC, 2007).

Population Growth and Overuse

Changing land use from natural bushland and landscapes also presents the potential to alter the natural hydrological regime. This can have impacts on both water quality and quantity.

Key examples of changing land use affecting natural hydrological cycles, which provide for recharging of important groundwater resources within the Gnangara Mound, include pine tree plantations and urban development. Pine tree plantations across the Gnangara Mound and within the City of Wanneroo have been identified as a key contributor to declining groundwater levels (Silberstein *et al*, 2007). Urban development results in a greater percentage of impermeable surfaces across landscapes, and reduces on site natural infiltration to groundwater, with water instead diverted to drainage areas or wetlands.

Stormwater

Stormwater is any water that falls on roofs, collects on paved areas, and runs over driveways, roads, or footpaths. Stormwater usually flows through urban areas into natural waterways and as the water travels over these landscapes, it picks up litter, chemicals, nutrients, and sediments that affect water quality. For example phosphorous and nitrogen, nutrients used in fertilisers, can lead to algal blooms in waterways that can be harmful to humans and other flora and fauna (SRT, 2006). Polluted wetlands have less wildlife and more midges, mosquitos, and algae (Lund *et al*, 2000).

Traditional approaches to stormwater has resulted in outfalls directing stormwater directly to waterways; water sensitive urban design practices manage stormwater to protect irrigate resources

With an increase in urban development in the City, there has been an increase in stormwater flows. Some new developments are based on water sensitive urban design, which aims to achieve natural flow and infiltration of water through urban settings thereby managing water quality (DoW, 2004-2007). However management of stormwater also needs to be considered when upgrading existing stormwater drainage and planning new developments to manage water quality.

Contamination

Contamination of inland waters with heavy metals from roads, vehicles, pesticides and paint can be very toxic to wetland flora and fauna (EPA, 2007), resulting in the collapse of that habitat. Contamination of waters can result from:

- Unsafe storage, use, or disposal of chemicals used in industry, business and agriculture resulting in contamination of land, which can then contaminate groundwater which flows toward inland waterways
- Dumping of waste products, such as paints, oils, solvents, or chemical residues, into stormwater drains
- Stormwater runoff from roads carrying oils and other hydrocarbons from cars into waterways



State

Within the City, a variety of land use activities occur that depend on water for use within their operations, these include agriculture, horticulture and commercial industries. The increased demand and impacts such as climate change and population growth are placing an increasing amount of pressure on our water resources.

The majority of water used within the City of Wanneroo is for domestic purposes with each person using 104.78kL of water per year. Water used within the City for the non-residential sector totals 1,157,826kL per year, based on 2005/2006 figures (CoW, 2008).

The City of Wanneroo is working with the state government to protect our existing water supply as a member of the Gnangara Sustainability Strategy Coordinating Committee, assisting in the development of the Gnangara Sustainability Strategy.

In 2007 the City of Wanneroo joined the ICLEI- Local Governments for Sustainability Water Campaign Program in order to reduce water usage and improve water quality. Council has committed to reducing scheme water consumption by 20 percent and groundwater consumption by 30 percent in its own operations. Council has also committed to reduce scheme water consumption within the community by 5 percent by 2014. Council has also set targets to improve the water quality within the City of Wanneroo.

The next phase of the project will involve the City developing a Water Action Plan that will set out a number of water reduction and water quality actions that will enable Council to achieve its targets.

Water Indicators

(14) Domestic water use per capita within residential sector

In 2005-06, domestic water use per capita, within the residential sector, was 104.78 kilolitres of scheme water per person per year; this does not include the use of groundwater for domestic gardens using private bores (CoW, 2008).

(15) Per capita water use by non-residential sector

In 2005-2006 the non-residential sector consumed 1,157,826 kilolitres of water, which equates to per capital use of 9.86 kilolitres per person per year (CoW, 2008).

(16) Corporate scheme water consumption per capita

In 2005-2006, the City used a total of 57,608 kilolitres of scheme water, equating to a per capita consumption of 0.49 kilolitres per person per year (CoW, 2008).

(17) Corporate groundwater consumption per capita

In 2005-2006 the City used a total of 2,523,472 kilolitres of groundwater for irrigation of parks and open space, equating to a per capita consumption of 21.49 kilolitres per person per year (CoW, 2008).

(18) Number of water quality improvement actions implemented

No baseline information is available for this indicator, however will be recorded through implementation of the Water Campaign.

Current Responses

With the growth in Wanneroo expected to reach 250,000 by 2021, management of water resources is going to be vital for healthy landscapes and to support our communities. The City is currently investing in water quality and quantity through the Water Campaign, supported by ICLEI, to manage water resources within Council and the community. A Water Action Plan, in development, will provide goals and actions for the City to effectively reduce water use, and enhance water quality. The City is also developing a Water Conservation Plan that specifically aims to minimise water use associated with irrigation of public places.

The Yellagonga Integrated Catchment Management Project will also work to improve water quality across the City. The Project will develop a three-way management strategy by the City of Wanneroo, City of Joondalup, and Department of Environment and Conservation to improve water quality within the wetlands of Yellagonga Regional Park.



Sustainable Use and Waste

WE PRODUCE SUBSTANTIAL AMOUNTS OF WASTE EVERYDAY AT HOME, AT WORK, AND THROUGH COMMERCIAL AND INDUSTRIAL PROCESSES. ALTHOUGH WASTE GENERATION HAS INCREASED OVER THE PAST 50 YEARS, THE WAY WE VIEW RESOURCE USE AND WASTE GENERATION IS NOW CHANGING WITH A GROWING INTEREST IN THE IMPACT OF CONSUMERISM ON OUR ENVIRONMENT (DOE, 2004).

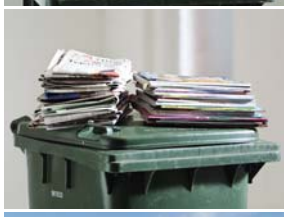
Despite new perceptions about resources and waste, increasing levels of resource use and waste generation is causing our present landfill sites to fill at a rapid rate. The increasing need for new landfill sites will put further pressure on our natural resources.

With current population statistics suggesting a dramatic increase in the City's population heading toward 2021 (ABS, 2007), more pressure will be placed on landfill sites without changes in how the community uses resources, and manages waste products.

Pressures

Key pressures on sustainable use and waste include:

- Population growth
- Consumption per capita
- Recycling behaviour
- Reduced lifespan of goods




Population Growth

The City is experiencing a significant period of population growth (ABS, 2007) that will further increase demand for resources and the volume of waste for disposal. Increasing volumes of waste will put greater pressure on local landfill, with increased demand for materials growing with our population.

Consumption Per Capita

Increased demand for goods in society can be linked to an increase in resultant waste generation. Increasing consumption per capita places greater pressure on resources, and produces greater levels of waste through production, packaging, and final disposal of goods.

Recycling Behaviour

With growing consumption and population size, the need to recycle products to reduce strain on our resources and greenhouse emissions is considerable. Further, recycling materials reduces the strain on landfill sites, providing greater space for other land uses and our natural ecosystems. In some sectors, recycling behaviour lacks the commitment it requires to assist our society to work towards greater sustainability in how we use, reuse and recycle our resources.

Reduced Lifespan of Goods

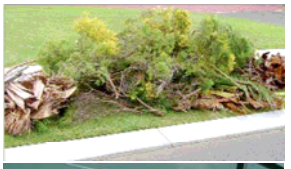
Electronic products are being more widely used in society; these products are frequently updated with newer versions of the same product. This has led to an increase in electrical products being sent to landfill as consumers upgrade. This places further strain on landfill sites, the amount of resources required for products, and ultimately our environment.

State

All waste collected within the City is disposed of at the Tamala Park landfill facility operated by the Mindarie Regional Council. Tamala Park also collects waste on behalf of the Cities of Joondalup, Perth, Stirling, and Wanneroo, and the Towns of Cambridge, Victoria Park, and Vincent. Tamala Park covers 252 hectares, 21 of which are dedicated to the receipt, recycling, and disposal of waste generated by in excess of 500,000 people. In 2005-2006, the city of Wanneroo was the third largest contributor of waste to Tamala Park, behind Joondalup and Stirling.

In 2005-2006. Tamala Park processed, recycled, and buried the following waste:

- General Waste – 346,306 tonnes
- Cover from off site – 13,942 tonnes
- Greenwaste processed – 2,850 tonnes
- Recycled items – 269 tonnes




Waste Indicators

(19) Amount of waste disposed of to landfill from the City of Wanneroo

For the 2005-2006 year, 45,845 tonnes of waste from across the City was disposed of to landfill. This equates to approximately 0.401 tonnes per capita which represents an increase of 3.8% from the previous year.

(20) Amount of waste being recycled in the City of Wanneroo

At the current stage 3,116 tonnes of waste is being recycled within the City of Wanneroo. This equates to approximately 0.027 tonnes per capita which represents an increase of 3.8% from the previous year.



Current Responses

The City is responding to resource use and waste generation both within Council operations and in the community. Within corporate activities, the City's Green Purchasing Plan is working toward greater purchase of sustainable and recycled materials to minimise impacts on natural resources and waste generation.

In the community, the City provides waste disposal and recycling services to all domestic households within the City. Domestic waste disposal services include weekly 240-litre bin collection, bulk verge collection of large items and greens, and a weekend greens recycling facility.

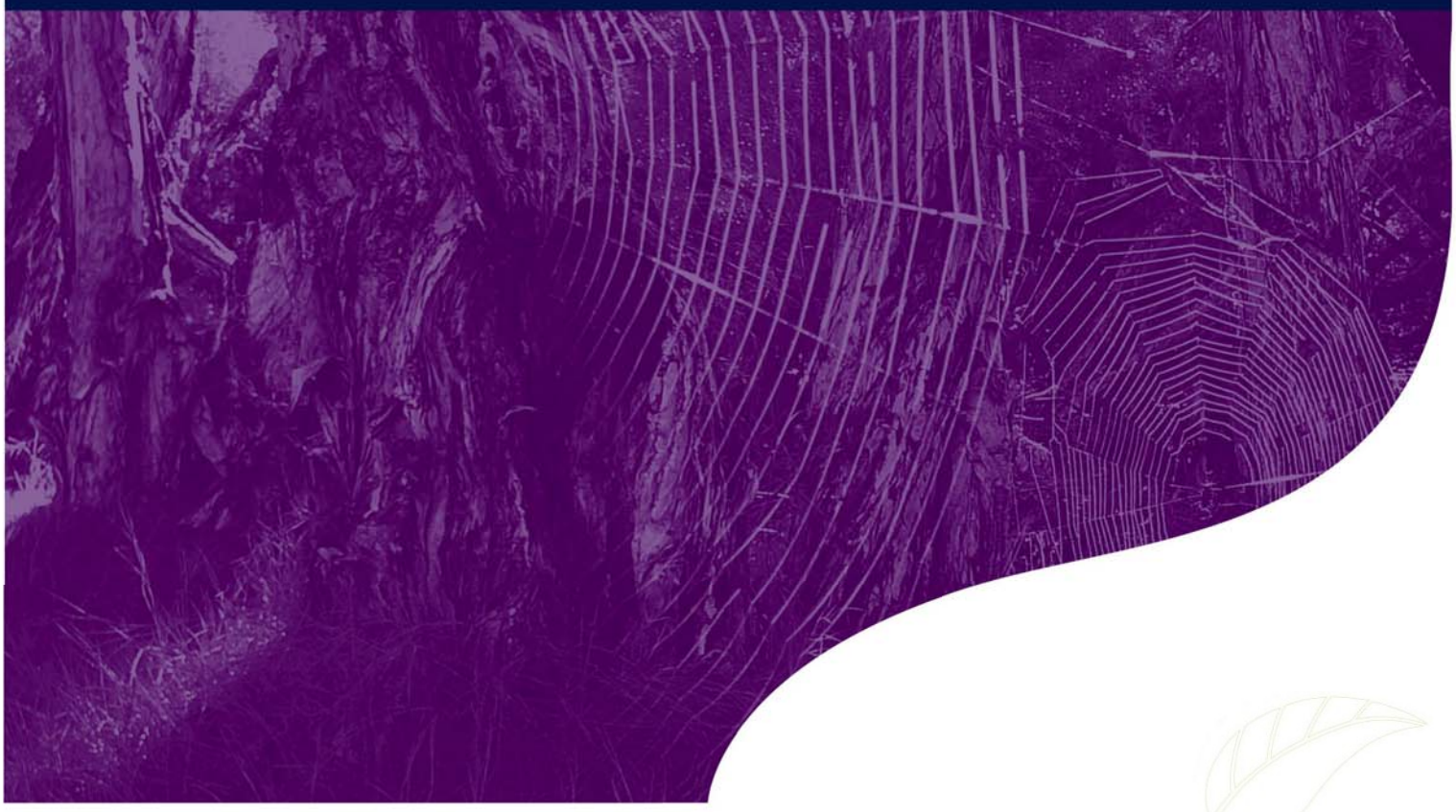
To support the local community work toward more efficient recycling, the City provides domestic recycling services, with the introduction of 240-litre recycling bins and a kerbside collection service, weekend greens recycling facility, and the sale of compost bins and worm farms. The City has also constructed a Materials Recovery Facility to maximise recycling of waste products from domestic collections and improve the quality of recyclables for sale. The City is also working with the Mindarie Regional Council in the development of a Resource Recovery Facility that will significant increase recycling of organic wastes into useable compost.




City of Wanneroo

PART III

City of Wanneroo Local Environment Strategy



Our Policy

THE CITY OF WANNEROO CONTAINS SOME OF THE MOST ECOLOGICALLY IMPORTANT AREAS REMAINING WITHIN THE PERTH METROPOLITAN AREA. COVERING AN AREA OF 685.8 SQUARE KILOMETRES OF LAND, THE CITY POSSESSES 32 KILOMETRES OF COASTLINE, OVER 31,000 HECTARES OF NATURAL BUSH, AND AREAS OF WETLANDS. THESE NATURAL ASSETS PROVIDE INTRINSIC NATURAL VALUES THAT ARE A SIGNIFICANT PART OF THE CITY'S CHARACTER.

The City of Wanneroo recognises its vital role in managing the local environment in the context of significant urban growth, and takes seriously its responsibility to ensure environmental considerations are an integral part of all decision making and planning processes. The environment is a key pillar of the Strategic Plan.

A sustainable natural and built environment.

We value our natural assets. Although we are challenged with the demand for urban growth and development, we will ensure the environmental impact on our wetlands, coast, bush and landforms is minimised.

We will promote creative design and diversity in the characteristics of our built structures.

We will encourage the reduction of greenhouse emissions and the use of alternative energy. We will minimise waste and pollution to create a healthy environment.

City of Wanneroo Strategic Plan 2006-2021

The City is committed to achieving a positive environmental outcome, as set out in the Strategic Plan, demonstrated by good environmental performance across all environmental themes.

Outcome 1: Environmental

A natural, built and healthy environment in harmony with the growth of our municipality

Strategic Plan 2006-2021

Ecosystems	Community	Air Quality and Greenhouse	Water Resources	Sustainable Use and Waste
Natural and urban areas that function as healthy ecosystems	A cohesive community aware of and engaged in environmental management	Clean, breathable air and a stable climate that supports our community's needs	Abundant, clean water for our community and environment	Sustainability in production, use, re-use, recycling and disposal of resources

The City is committed to integrating the above environmental philosophy by:

1) Ensuring the City's operations address and align with environmental outcomes and objectives;
2) Demonstrating corporate leadership and facilitating community care of the local environment; and
3) Aligning decision-making tools with environmental outcomes and objectives to effectively influence the activities and impacts of external stakeholders.

Our Strategies

THE OBJECTIVES AND STRATEGIES OF THE LOCAL ENVIRONMENTAL PLAN PROVIDE A BLUEPRINT TO INTEGRATE THE CITY'S ENVIRONMENTAL POLICY INTO ALL OPERATIONAL AREAS AND MANAGE THE CITY'S ENVIRONMENTAL IMPACT. THE STRATEGIES ALSO PROVIDE A BENCHMARK AGAINST WHICH TO ASSESS DECISION-MAKING AND DECISION-MAKING TOOLS TO MANAGE THE IMPACT OF STAKEHOLDERS THAT THE CITY INFLUENCES.

1. City Operations

Objective 1.1
Manage natural assets in the context of their catchments to retain and promote their conservation value

Strategies

1.1.1 Prepare and implement management plans and programmes for natural areas and wetland catchments

1.1.2 Develop and implement protocols to effectively manage the City's land and practices to protect and promote their environmental value

Key projects

Yellagonga Integrated Catchment Management program
Conservation Maintenance Schedule
Staff and Council environmental awareness training
Reserve Management Plan development and review
Weed Management Policy

Objective 1.2
Minimise Wanneroo's contribution to human induced climate change

Strategies

1.2.1 Reduce greenhouse gas emissions produced through the City's operations, and within the community

1.2.2 Lead the community in efforts to adapt to impacts of climate change

Key projects

Cities for Climate Protection
Energy Action Plan
Green Purchasing Action Plan

Objective 1.3
Manage and enhance the quantity and quality of our natural water resources

Strategies

1.3.1 Develop action plans and programs to increase water efficiency and improve water quality

1.3.2 Develop and implement a strategic approach to achieve total water cycle management across the City

1.3.3 Provide services and information to maintain public health standards in water quality

Key projects

Water Conservation Plan
ICLEI Water Campaign
Water Action Plan

Objective 1.4
Improve sustainability in the production, use, and disposal of resources

Strategies

1.4.1 Improve waste management practices within the City and Community

1.4.2 Encourage sustainable waste management options and improve resource recovery

1.4.3 Promote sustainable industry and cleaner production

Key projects

Strategic Environmental Waste Management Plan

2. Corporate Leadership

Objective 2.1
Engage the community in management of our local environment

Strategies

2.1.1 Support and build capacity of volunteers to undertake bushcare and other biodiversity conservation initiatives coordinated by the City

2.1.2 Promote community awareness and understanding of local environmental issues

2.1.3 Advocate for greater opportunity for the local community to be involved in development of local, state and federal environmental programs, initiatives, and policies

Key projects

Community Environmental Education Strategy
EcoVision Wanneroo


3. Influence

Objective 3.1
Achieve development in tune with the local environment

Strategies

3.1.1 Identify, retain and reflect the local natural environment through land development processes

3.1.2 Identify and retain suitable horticultural landscapes

3.1.3 Achieve water sensitive urban design

Key projects

Local Biodiversity Strategy
Local Policy Framework
City-wide Water Management Strategy

Objective 3.2
Advocate for action by external stakeholders to achieve better environmental outcomes in Wanneroo

3.2.1 Advocate to the State Government for greater protection of natural assets within State planning processes

3.2.2 Advocate to State and Federal Governments to protect and manage landscapes within the national reserve system

3.2.3 Advocate to the State and Federal Governments to implement measures to reduce greenhouse gas emissions to levels required to manage future climate change

3.2.4 Advocate to the State Government to secure water availability for responsible development and management of open space areas within the City

3.2.5 Advocate to the State Government for measures to reduce incidence of air pollution in Perth and surrounds

Implementation

Environmental management will be undertaken through diverse activities the City is responsible for, including:

- Land use planning
- Infrastructure planning, construction and maintenance
- Community safety
- Community engagement
- Waste management
- Building and environmental health
- Sustainable development
- Economic development
- Leadership and governance

Implementation of environmental policy, objectives, and strategies will be achieved through specific environmental plans and projects including:

- Energy Action Plan
- Green Purchasing Action Plan
- Local Biodiversity Strategy
- Yellagonga Integrated Catchment Management Plan (in development)
- Water Action Plan (in development)
- City Water Management Strategy (in development)
- Environmental Education Plan (in development)

The City will work closely with the community in the implementation of the LEP, and will be guided by the advice of the Environmental Advisory Committee. Internally, an Environmental Steering Committee, representing Managers of all relevant service units, will be established to oversee the implementation of the LEP. The Environmental Steering Committee will meet quarterly discuss arising environmental issues and solutions, and monitor the LEP's progress and trends in the local environment.

Monitoring and Review

The City will provide regular information to the community on the progress of the Local Environmental Plan and trends in the local environment through Council's annual reporting process.

The following tables illustrate how strategies of the LEP are expected to contribute to positive changes in the local environment, as measured by indicators from the State of the Local Environment. It is noted that, although the strategies of the LEP will contribute to positive changes in the local environment, the indicators may also be influenced by factors and projects beyond Council. The tables will be updated and published annually through Council's Annual Report.

The trend targets provided for the indicators within the LEP will provide a strategic assessment of the environmental performance of the City. More specific targets for issues such as biodiversity, water conservation, and greenhouse gas emissions are provided and monitored by issue-specific plans, including the Local Biodiversity Strategy, Water Action Plan, and Energy Action Plan.

The strategies of the LEP will be subject to minor biannual reviews, informed by environmental indicators, with a major five-year review of the LEP to commence in 2014.

Strategies contributing to Ecosystems indicators and expected trends with successful implementation						
Strategies \ **Indicators**	Area of natural vegetation protected within local or regional reserves	Number of natural reserves identified as having local or regional conservation significance recognised as such	Number of City managed natural reserves identified as having local or regional conservation significance with management plans	Percentage area of Threatened Ecological Communities protected within local or regional reserves	Percentage of areas of known habitat for rare species protected within local or regional reserves	Area of land zoned for agricultural uses within the City
1.1.1 Prepare and implement management plans and programmes for natural areas		⇑	⇑			
1.1.2 Develop and implement protocols to effectively manage the City's land and practices to protect and promote their environmental value			⇑			
1.1.3 Develop and implement integrated catchment management plans for priority wetlands and their catchments			⇑			
3.1.1 Identify, retain and reflect the local natural environment through land development processes	⇑	⇑		⇑	⇑	
3.1.2 Identify and retain suitable horticultural landscapes						⇓ *
3.2.1 Advocate to the State Government for greater protection of natural assets within State planning processes	⇑	⇑		⇑	⇑	⇓ *
3.2.2 Advocate to State and Federal Governments to protect and manage landscapes within the national reserve system	⇑	⇑				
⇑ Increasing trend anticipated ⇓ Decreasing trend anticipated						

* Due to urbanization of horticultural areas, for example across East Wanneroo, a decreasing trend of horticultural landscapes cannot be avoided. However, the extent of the decreasing trend can be reduced by identification of new horticultural precincts in appropriate locations, to protect the natural environment whilst providing local access to fresh produce for the community.

Strategies contributing to Community indicators and expected trends with successful implementation			
Strategies \ **Indicators**	Number of environmental-based community groups and Friends groups in the City of Wanneroo	Number of community members attending environmental events	Number of schools participating in environmental education programs
2.1.1 Support and build capacity of volunteers to undertake bushcare and other biodiversity conservation initiatives coordinated by the City	⇑		
2.1.2 Promote community awareness and understanding of local environmental issues		⇑	⇑
2.1.3 Advocate for greater opportunity for the local community to be involved in development of local, state and federal environmental programs, initiatives, and policies	⇑	⇑	⇑
⇑ Increasing trend anticipated ⇓ Decreasing trend anticipated			

Strategies contributing to Air Quality and Greenhouse indicators and expected trends with successful implementation				
Strategies \ **Indicators**	Percentage of Wanneroo residents using public transport or other sustainable methods of travelling to work	Number of days where NEPM standard for ambient inhalable particles is exceeded	Total corporate greenhouse gas emissions saved through energy reducing activities (tonnes per year)	Total community greenhouse gas emissions saved through energy reducing activities (tonnes per year)
1.2.1 Reduce greenhouse gas emissions produced through the City's operations, and within the community	⇑		⇑	⇑
1.2.2 Lead the community in efforts to adapt to impacts of climate change				
3.2.3 Advocate to the State and Federal Governments to implement measures to reduce greenhouse gas emissions to levels required to manage future climate change			⇑	⇑
3.2.5 Advocate to the State Government for measures to reduce incidence in Perth and surrounds		⇓		
⇑ Increasing trend anticipated ⇓ Decreasing trend anticipated				


Strategies contributing to Water Resources indicators and expected trends with successful implementation					
Strategies \ **Indicators**	Domestic water use per capita within residential sector	Per capita water use by non-residential sector	Corporate scheme water consumption per capita	Corporate groundwater consumption per capita	Number of water quality improvement actions implemented
1.3.1 Develop action plans and programs to increase water efficiency and improve water quality	⇓	⇓	⇓	⇓	⇑
1.3.2 Develop and implement a strategic approach to achieve total water cycle management across the City	⇓	⇓	⇓	⇓	⇑
1.3.3 Provide services and information to maintain public health standards in water quality					⇑
3.1.3 Achieve water sensitive urban design	⇓	⇓		⇓	⇑
3.2.4 Advocate to the State Government to secure water availability for responsible development and management of open space areas within the City				⇓	
⇑ Increasing trend anticipated ⇓ Decreasing trend anticipated					

Strategies contributing to Sustainable Use and Waste indicators and expected trends with successful implementation		
Strategies \ Indicators	Amount of waste disposed to landfill from City of Wanneroo	Amount of waste being recycled in the City of Wanneroo
1.4.1 Improve waste management practices within the City and Community	⇑	⇑
1.4.2 Encourage sustainable waste management options and improve resource recovery	⇑	⇑
1.4.3 Promote sustainable industry and cleaner production	⇑	⇑
⇑ Increasing trend anticipated ⇓ Decreasing trend anticipated		

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Local Environmental Plan

2009 - 2014

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