FairfieldCity
Celebrating diversity

FAIRFIELD **BIODIVERSITY** STRATEGY

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This strategy recognises that Aboriginal people have traditionally had responsibility for custodianship of their country. Traditional custodianship acknowledged the spiritual and physical values of natural ecosystems of the region. The strategy acknowledges the continuation of these responsibilities and supports partnerships in the planning and management of the natural ecosystems of the region.

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Acronyms

AA	Activity Approval
APZ	Asset Protection Zone
CAP	Catchment Action Plan
CMA	Catchment Management Authority
CSA	Conservation Significance Assessment
DA	Development Approval
DCP	Development Control Plan
DECC	Department of Environment and Climate Change
DNR	Formerly the Department of Natural Resources
DoP	Department of Planning
EEC	Endangered Ecological Community listed under the NSW *TSC Act* or the Commonwealth *EPBC Act*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*
EPI	Environmental Planning Instrument
ESD	Ecologically Sustainable Development
ESL	Environmentally Significant Lands
FM Act	*Fisheries Management Act*
GIS	Geographic Information System
HCV	High Conservation Value
LEP	Local Environment Plan
LCV	Low Conservation Value
CITY	Local Government Area
LG Act	*Local Government Act*
NES	(Matter of) National Environmental Significance
NPWS	New South Wales National Parks and Wildlife Service
NRC	Natural Resource Commission
NRM	Natural Resource Management
POM	Plan of Management
REF	Review of Environmental Factors
REP	Regional Environment Plan
RTA	Roads and Traffic Authority
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
SOE	State of the Environment Report
TSC Act	NSW *Threatened Species Conservation Act, 1995*

Please note: There is also a glossary of terms used in this document. The glossary follows the reference section at the end of this report.

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Executive Summary

The Fairfield Biodiversity Strategy (strategy) has been prepared as one of the strategic studies to provide the technical and scientific framework for the proposed Conservation and Recreation zones established in the draft LEP. The Strategy is primarily concerned with the biodiversity (native plants and animals, genetic variations, populations, ecosystems and ecological processes) found within or dependent on the landscape of Fairfield City. It recognises that there are factors and forces that influence the biodiversity in the area that are outside the geographic area of the city. Likewise it recognises that the biodiversity of the city contributes to and influences the biodiversity of surrounding regions.

The strategy has been reviewed by the relevant State Government Departments and Agencies and has received support from each as required by the Department of planning Guidelines.

The Strategy applies to all land within the city where the LEP applies and provides information to assist compliance with the requirements of the relevant State and Federal legislation governing management of land where native flora and fauna exist.

A key element of the strategy was to undertake a mapping exercise that has identified the areas of the city where compliance with the Threatened Species Conservation Act is a mandatory element of the development process. The mapping will assist land owners and developers in identifying native bushland which inturn enables applicants to management their existing legislative requirements.

The strategy provides an outline of the statutory and policy framework for biodiversity in Fairfield and presents the conservation values of native vegetation within the Local Government Area and identifies the presence of habitat for habitat fauna. Areas with vegetation and habitat in the Fairfield City are categorised into high, medium and low conservation values by a set of criteria based on best available environmental data and advice including information from Department of Environment and climate Change.

The results of the conservation significance assessment point to a number of findings including:

- Almost all native vegetation within the CITY is comprised of endangered ecological communities (EECs) listed under the NSW *Threatened Species Conservation Act 1996*.
- The limited extent of conservation values within the CITY
    - HCV=8.31%,
    - MCV=2.78%,
    - LCV=4.46%,
    - total of the CITY =15.55% including WSP.

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- Over half (52.72%) of the City's HCV areas within the Western Sydney Parklands.
- Over half (57%) of the vegetation communities within the CITY are Shale derived woodlands (Shale Plain Woodlands and Shale Hills Woodlands).
- Over two thirds (67%) of the vegetation in riparian corridors is of high conversation significance.
- Approximately 31% of HCV woodlands occur in the semi rural areas of the city.
- A limited representation of conservation values in Public Lands ~18%.
- Approximately 9% of urban areas contain conservation significance.
- Over half (61.21%) of the City's LCV areas are within urban areas
- Approximately 42% of the HCV outside the Western Sydney Parklands occurs as Alluvial Woodland increasing the need for protection in riparian areas of the city. This area and percentage increases if you include Riparian Forests and Swamp Woodlands (47%).
- Approximately 40% of classified riparian buffers contain significant remnant vegetation (HCV, MCV or LCV).
- Limited areas of the fauna habitat remain in the city

Generally, there is a concentration of conservation values for the entire city within the Western Sydney Parklands. This skews the representation of data. These results point to the need to focus on riparian zones within all areas of the city. There is also a dominance of woodland EECs in the semi-rural areas of Fairfield City compared to riparian EECs dominating the urban areas.

The Strategy has excluded the Western Sydney Parklands from the strategy as it is not in Councils care or control.

This strategy includes recommendations to protect and enhance known biodiversity values using remnant native vegetation as a mapping surrogate. The sections of the strategy that refer to Fauna habitat adapts the classification system developed for the Rapid Fauna Assessment which ranges from Highest, Very High , High, Moderate to Low. The major sites of significance include the Prospect Reservoir, Western Sydney Regional Park, Chipping Norton Lakes and Mirabeena Regional Park.

A essential element of the strategy is the vegetation mapping that identifies the location of native vegetation and classifies the most valuable areas using a three level classification referred to as the conservation Significance Assessment (CSA). It is expected that the CSA maps will be available to the public on Council's website and that assessment vegetation as part of the test of significance in accordance with State legislation will make reference to the CSA maps.

Recommendations for strategic planning are suggested for consideration in the comprehensive Local Environmental Plan (LEP) review. Amendments to LEP zoning definitions and the provision of objectives for environmentally sensitive land, including land in riparian and local corridors are provided.

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Recommendations for conserving vegetation communities and habitat are included in the Biodiversity Strategy Implementation Plan.

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1. Introduction

The natural ecosystems of Fairfield City have been extensively modified since European settlement. Vegetation cover has been drastically reduced in the Fairfield Local Government Area (City) by approximately 83%.

The main threat to remaining native vegetation, fauna habitat, riparian zones and ecosystem functions is posed by continued encroachment and impacts of development, declining water quality and stormwater controls and weed invasion.

Local government is increasingly being asked by the community, and required by law, to take a greater role in the management, protection and enhancement of the natural environment. Some of the environmental and planning issues faced by Fairfield City Council are common to local governments across NSW, many however are unique to Fairfield and require tailored and strategic responses.

This strategy provides Fairfield Council with a strategic and practical approach to undertaking its roles and responsibilities for the protection, enhancement and conservation of the native plants and animals within Fairfield City. This strategy:

- outlines relevant legislative requirements
- presents an outline of biodiversity values within Fairfield City
- recommends appropriate planning mechanisms to be included the comprehensive LEP review process
- details management actions for natural areas that Fairfield Council are directly responsible for, and
- suggests strategies and actions for maintaining or improving the biodiversity within the City.

1.1 City of Fairfield Local Government Area

Fairfield City lies in the heart of the Cumberland Plain. The City of 27 suburbs over an area of 104km^2 is approximately 32km from Sydney Central Business District (CBD). Figure 1 below shows the location of Fairfield City.

The City of Fairfield is a complex system of natural and built components that reflect the urbanisation of the area. It is dominated by a generally flat topography, clay soils and floodplains adjacent to the creeks within the City. These conditions have produced unique vegetation communities including Cumberland Plain Woodland, Moist Shale Woodland, Shale-gravel Transition Forest, Western Sydney Dry Rainforest in moist gullies and Sydney Coastal River Flat Forest along riparian corridors.

Fairfield City has eight major creeks within it's boundaries. The western area of the City, South Creek, Eastern Creek and Ropes Creek flow into the Hawkesbury-Nepean Catchment (See Figure 1).

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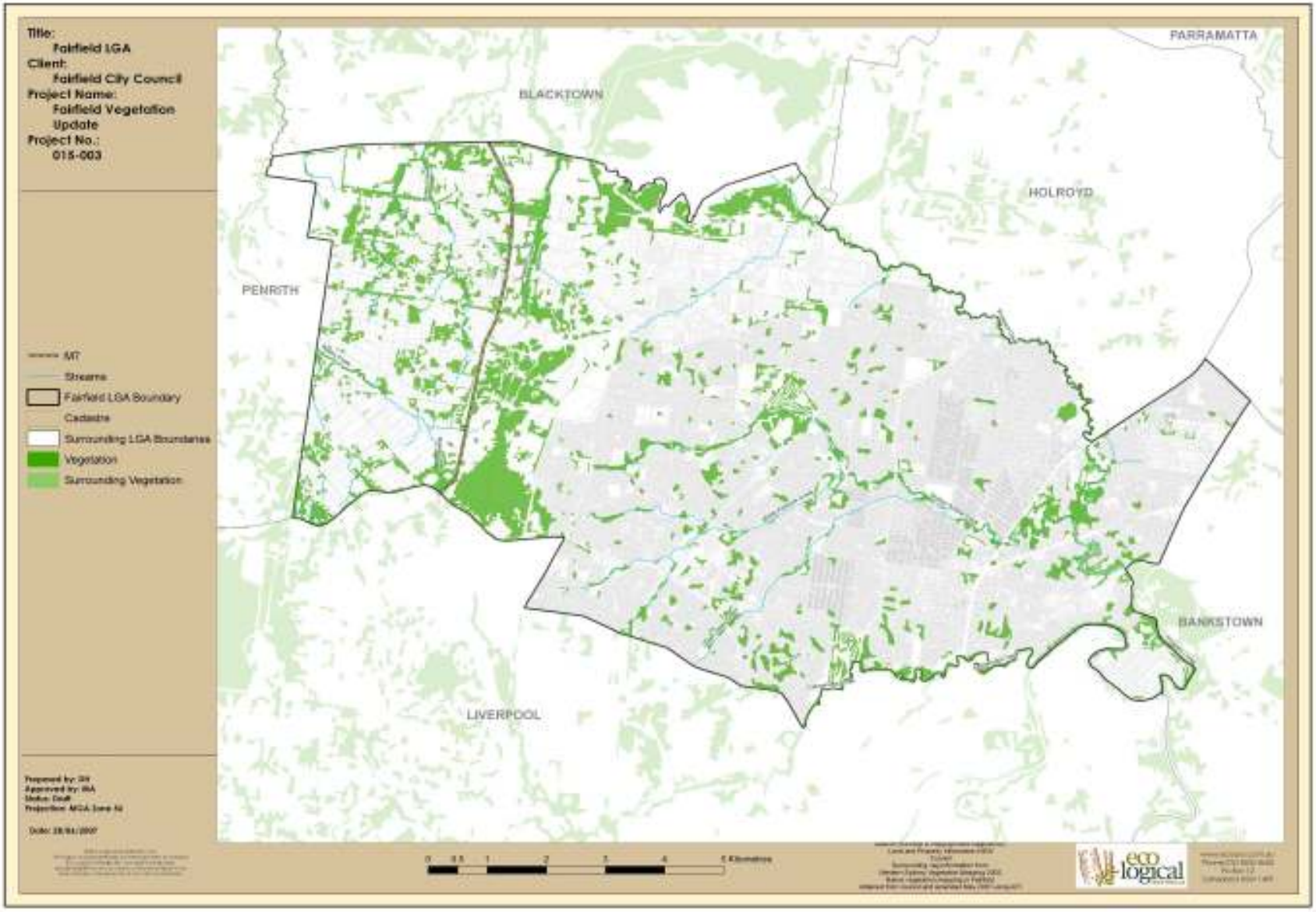
The eastern and southern sections of the City are part of the Prospect Creek and Cabramatta Creek sub-catchments that flow into the Georges River (which eventually flows into Botany Bay). The waterways in these sub-catchments are a mix of natural creeks, concrete lined channels and enclosed pipe drainage systems. The majority of Fairfield City's residents live within these two sub-catchments. The largest is the Prospect Creek sub-catchment, which covers an area of 98 square kilometres. All together there are over 80km of creeks in these urban sub-catchments. Prospect Creek and Cabramatta Creeks form a boundary for the City, adding an additional layer of complication for managing these sections of creeks.

Semi-rural land use characterises the suburbs of Horsley and Cecil Parks in the west of the City.

There are hundreds of parks and other open space within the City, including 60 major parks. The Western Sydney Regional Parklands is also partly within Fairfield City. The Parklands are a large open space of more than 5,400 hectares located within Blacktown, Fairfield and Liverpool council areas. The parklands in Fairfield City contain a major biodiversity corridor on the Cumberland Plain centred on Eastern Creek. In the parklands, the Department of Planning and Greening Western Sydney have planted hundreds of thousands of plants. The Sydney Metropolitan Strategy will impact upon this area and has the potential to further reduce the biodiversity value of the City through further development unless this development is carefully managed.

The biodiversity values of the City are described in more detail in Section 3 of this strategy.

Figure 1: Fairfield City Local Government Area



1.2 What is biodiversity?

The *National Strategy for the Conservation of Australia's Biological Diversity* (DEST 1996) defines biodiversity (or biological diversity) as:

> The variety of all living things, including plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they for a part. It is not static, but is constantly changing: it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline, and extinction.

The concept of biodiversity emphasises the interconnectedness and interdependence of all life on earth and can be considered at three levels; species diversity, ecosystem diversity and genetic diversity. This is the definition adopted for this biodiversity strategy.

This biodiversity strategy is primarily concerned with the biodiversity (native plants and animals, genetic variations, populations, ecosystems and ecological processes) found within or dependent on the landscape of Fairfield City. It does however recognise that there are factors and forces that influence the biodiversity in the area that are outside the geographic area of the City. Likewise it recognises that the biodiversity of the City contributes to and influences the biodiversity of surrounding regions.

1.3 Aim of this Strategy

This Strategy has been guided by the inter-relationship between various council functions, namely statutory and management planning, operational management, education, funding and resources, and overall monitoring. This Strategy document is linked to the Fairfield Local Environmental Plan, Fairfield City Plan, Fairfield City Council Management Plan and the Fairfield Environmental Management Plan.

The aims of this strategy are to:

- Provide for the conservation of native plants, animals, habitat and ecological processes in Fairfield City.
- Provide priorities and guidance for Council in making decisions relevant to managing these native plants and animals, and the natural environment of the area.
- Provide guidance for the use, conservation and enhancement of natural resources in Fairfield City according to the principles of Ecologically Sustainable Development.
- Provide a greater level of certainty for the community using a pre-defined, transparent and accountable process.
- Guide staff in considering issues affecting biodiversity when making land

use planning, management, resource, training and operational decisions.

- Set out a framework within which Council can make decisions with the community and State Government agencies, which will positively impact on the future of the biodiversity and sustainable development of the Fairfield area.
- Provide a transparent basis for the community to identity those areas of the city where native bushland has conservation significance.

1.4 Research basis of the Strategy?

This strategy and the Vegetation Mapping Update Project has been the principle source of information in preparing the vegetation conservation assessment. Research published by DECC on the Habitat Assessment on the Sydney Catchment Authority has been used to classify fauna habitat. There is a lack of information on aquatic biodiversity with the exception of the "Fish in Orphan Schools Creek" fish survey by Daniel Smart (2003). The strategy does however rely heavily on using vegetation communities as a surrogate for biodiversity and aims to protect and conserve biodiversity primarily through the management of vegetated habitat.

2. Statutory Framework

There are a number of relevant statutes, plans and policies which directly relate to biodiversity management in Fairfield City. This section provides an overview of regulations, state policies, natural resource management plans and Council provisions that directly relate to the conservation of biodiversity within the City of Fairfield.

This framework includes commonwealth legislation and policies, state legislation, environmental planning policies, regional planning instruments (REPs), Catchment Action Plans (CAPs), and local planning instruments. The key instruments are outlined below. More detailed descriptions of other relevant legislation and policies are provided in **Appendix A**.

2.1 Environment Protection and Biodiversity Conservation Act, 1999.

The *Commonwealth Environmental Protection and Biodiversity Conservation Act, 1999* (EPBC Act) provides a national scheme for environmental protection and biodiversity conservation. The purpose of the Commonwealth *EPBC Act* is to ensure that actions likely to cause a significant impact on a matter of national environmental significance undergo an assessment and approval process. Under the *EPBC Act*, an action includes a project, undertaking, development or activity.

The *EPBC Act* also lists threatened and migratory species which occur within the City (14 migratory, 21 species and two communities). These migratory species are listed as the EPBC Act also incorporates international treaties that Australia is a signatory.

2.2 Environmental Planning and Assessment Act 1979

Council has a range of development assessment and approval functions under the *Environmental Planning and Assessment Act 1979*, which includes in its objectives the proper management of natural resources, and the promotion of orderly and economic development of land.

When deciding if a proposal should be approved, the consent/determining authority (e.g. Council) must consider a range of environmental matters including maintenance of biodiversity and the likely impact on threatened species, populations or ecological communities.

2.3 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) and amendments in 2002, 2004 and 2006, identify threatened species, communities and populations, and outlines provisions for managing and protecting them.

The TSC Act also indicates the assessment process for proposed development that is likely to have a significant effect on threatened species, populations, or ecological communities, or their habitats.

Council is the primary agency for determining whether a significant effect is likely to occur and has a responsibility to ensure that it makes decisions relating to threatened species, communities and populations, on the best available information.

2.4 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) aims to conserve, develop and share the fishery resources of NSW. The Act also protects both marine vegetation, fish habitat (freshwater and marine) and threatened species, including species and habitat found in inland rivers. The Act also provides for the identification of critical habitat and threatening processes.

2.5 Local Government Act 1993

Council has a charter set out in the *Local Government Act (LGA) 1993* to address biodiversity conservation. Section 8(1) of the Act details this charter:

> "*to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development*".

Plans of Management have been prepared for public lands in the City under the LG Act. Typically these plans include environmental management provisions linked to the Fairfield City Management Plan and Environmental Management Plan. There are also provisions (s36B and C of the LGA) which detail Council's obligations in responding to recovery planning, threatened species habitat and areas of natural value.

2.6 New LEP guidelines

The Department of Planning has issued model provisions for the redrafting of all LEPs in NSW. These model provisions set out in an order under the Environmental Planning and Assessment Act, *Standard Instrument (Local Environmental Plans) Order 2006,* a consistent set of zone names and objectives and other matters that can be addressed in the relevant sections of the new LEP.

2.7 Fairfield Local Environmental Plan (LEP) 1994

The current Fairfield Local Environmental Plan contains no environmental zoning, however there are provisions relating to biodiversity in the following sections:

- Tree Protection (s10)
- Development of flood-liable land (s11)
- Development in the vicinity of creeks and waterways (s12) including a 20m exclusion zone from the top of bank

- Landfill and clearing (s13) including requiring council consent for all clearing of land
- Council consent required for the construction of dams in rural areas (s23)
- Natural heritage items listed in Schedule 4 such as the Red Gums on Cabramatta Golf Course are protected through s30-33 of the LEP.

Council is reviewing the 1994 LEP to bring the instrument into line with the Standard instrument gazetted by DoP.

The *Standard Instrument (Local Environmental Plans) Order 2006* requires the LEP to be prepared based on strategies and research that support the provisions of the new zones. This Strategy will meet these requirements.

2.8 Fairfield City Wide DCP 2006

Development Control Plans (DCPs) contain specific requirements for development. The purpose of the Fairfield City Wide Development Control Plan (The City Wide DCP) is to illustrate the controls that apply to particular types of development. This City Wide DCP supplements Fairfield Local Environmental Plan 1994 and is made according to the *Environmental Planning and Assessment Act 1979*.

The current Fairfield City Wide DCP 2006 has provisions for environmental site assessments for development, tree protection orders and landscape planning provisions. ICouncil is in the process of preparing a more detailed Landscape DCP and the Fairfield City Wide DCP 2006 will be updated following the comprehensive LEP review.

2.9 Other Relevant Controls

Other relevant legislation, planning instruments and policies are listed below. Many of these are described in **Appendix A**:

- *National Strategy for the Conservation of Australia's Biological Diversity*
- *National Objectives and Targets for Biodiversity Conservation*
- *Intergovernmental Agreement on the Environment (IGAE)*
- *National Local Government Biodiversity Strategy (1998)*
- *JANIS Criteria and CAR Principles*
- *National Parks and Wildlife Act 1974*
- *Catchment Management Act 2003*
- *State Environmental Planning Policy (SEPP) 19 –Bushland in Urban Areas*
- *Sydney Regional Environmental Plan No 31—Regional Parklands*
- *Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment*
- *Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997)*
- *State Biodiversity Strategy*
- *NSW State- Wide Targets for Natural Resource Management*
- *Catchment Action Plans*

- *Rivers and Foreshores Improvement Act 1948*
- *Rural Fires Act 1997*
- *NSW Rural Fires and Environmental Assessment Legislation Assessment Act 2002*
- *Water Management Act 2000*
- *Conveyancing Act 1919*
- *Noxious Weeds Act 1993*
- *Community Schemes Legislation*
- *Nature Conservation Trust Act, 2001*
- *National Parks and Wildlife Act, 1974*
- *Protection of the Environment Operations Act 1997*
- *Natural Resource Commission Act 2004*
- *The Fairfield City Council Environmental Management Plan 2006-2016*
- *Tree Preservation Orders*
- *Green Web.*
- *Council Reserve Plans of Management.*
- *Stormwater Management Plans.*
- *Water Sensitive Urban Design.*
- *Draft Cumberland Plain Recovery Plan*

3. Biodiversity in Fairfield City

3.1 Ecological Processes (Aquatic and Terrestrial)

Ecological processes play a vital role in maintaining the integrity and continuity of ecosystems. Areas in Fairfield City that support important ecological processes include waterways, riparian areas and areas covered by native vegetation and local habitat of know threatened fauna.

Riparian zones refer to any land which adjoins, directly influences, or is influenced by a body of water. The width of riparian land is largely determined by management objectives, and may need to be defined in terms of distances from water bodies or by mapping. Riparian land in Fairfield City is defined in this strategy by 10, 20 and 40m buffers around streams.

Creeks and the relevant riparian boundaries have been identified using a top of bank boundary information held within Council's mapping system. This information is based upon the best survey information available to Council at the time of preparation. In the rural area many of the creeks are located on private property and top of bank information has been prepared using a combination of some survey data and information available through aerial photography. In some instances property owners may choose to have the top of bank boundary reviewed. The most cost effective manner of having the top of bank and therefore the extent of the riparian corridor reviewed and amended will be through actual land survey. In most instances this type of survey would be conducted as part of sale or in preparing a development application. In most instances owners will be able to rely upon the proposed maps without having to prepare a separate land survey.

Riparian zones in Fairfield City are important in supporting the following ecosystem processes:

- Species interactions (plant recruitment, animal community change)
- Nutrient cycling
- Hydrological
- Filter sediments, phosphorous and organic nitrogen
- improving the quality of water entering watercourses
- Erosion and sedimentation
- Corridors and corridor movement

Native vegetation refers to indigenous trees, shrubs and ground cover provided by native plants and includes corridors. Vegetation serves many ecological processes, such as:

- Regulates the flow of water through photosynthesis.
- Regulates nutrient cycles in particular in regards to carbon and nitrogen
- Provides habitat for fauna
- Allows movement of fauna through corridors

- Allows species interactions at a larger scale (plant recruitment, animal community change)
- Moderates climate (local and global energy balances)
- Controls and prevents soil erosion
- Influences fire regimes

3.2 Ecological Values

3.2.1 International

A search of the EPBC website found that 14 migratory species of international importance either known or likely to occur in Fairfield City (see **Appendix B**). These species are listed as migratory under the commonwealth EPBC Act, which means that they are listed under one or more of the following International Conventions:

- Japan-Australia Migratory Bird Agreement (JAMBA)
- China-Australia Migratory Bird Agreement (CAMBA)
- Convention on the Conservation of Migratory Species of Wild Animals - (Bonn Convention)

These species typically occur in rivers systems, wetlands, farm dams, estuaries and foreshores within the Sydney Bioregion.

3.2.2 National

There are six (6) flora species, six (6) terrestrial fauna species, two (2) fish species and one endangered ecological community recorded in Fairfield City that are listed as threatened under the Commonwealth EPBC Act. These species and community are listed below in Table 2.

Table 1: Threatened species listed under the EPBC Act in Fairfield City.

Scientific name	Common Name	EPBC Status
Acacia pubescens	Downy Wattle, Hairy Stemmed Wattle	Critical
Cynanchum elegans	White-flowered Wax Plant	Endangered
Grevillea parviflora subsp. *Parviflora*		Vulnerable
Persoonia nutans		Endangered
Pimelea spicata		Endangered
Pomaderris brunnea	Rufous Pomaderris	Vulnerable
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Vulnerable
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE mainland)	Vulnerable
Pteropus poliocephalus *	Grey-headed Flying-fox	Vulnerable
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (SE mainland population)	Endangered
Hoplocephalus bungaroides	Broad-headed Snake	Vulnerable
Macquaria australasica	Macquarie Perch	Endangered
Prototroctes maraena	Australian Grayling	Vulnerable
Cumberland Plain Woodland		Critical

		Ecological Community
Turpentine-Ironbark Forest in the Sydney Basin Bioregion		Critically Endangered

*Roosting known to occur within area, Source: search of the EPBC Protected Matters website for Fairfield CITY

3.2.3 State

There are five (5) flora species (of which four (4) are also listed under the EPBC Act) and 21 fauna species (of which 4 are also listed under the EPBC Act) listed as threatened under the *NSW Threatened Species Conservation Act 1995,* recorded within Fairfield City. There is also one endangered flora population listed for Fairfield City. These species are listed below in Table 2. No species listed under the *Fisheries Management Act (1994)* have been previously recorded in Fairfield City however this does not mean that they do not occur.

Table 2. Threatened species listed under the NSW TSC Act in Fairfield City.

Scientific Name	Common Name	TSC Status
Marsdenia viridiflora subsp. *viridiflora*	*Marsdenia viridiflora* subsp *viridiflora* in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpol and Penrith City's	E2
Acacia pubescens	Downy Wattle	V
Cynanchum elegans	White-flowered Wax Plant	E1
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V
Persoonia nutans	Nodding Geebung	E1
Pimelea spicata	Spiked Rice-flower	E1
Callocephalon fimbriatum	Gang-gang Cockatoo	V
Cercartetus nanus	Eastern Pygmy-possum	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V
Grantiella picta	Painted Honeyeater	V
Ixobrychus flavicollis	Black Bittern	V
Lathamus discolor	Swift Parrot	E1
Litoria aurea	Green and Golden Bell Frog	E1
Meridolum corneovirens	Cumberland Plain Land Snail	E1
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V
Mormopterus norfolkensis	Eastern Freetail-bat	V
Ninox strenua	Powerful Owl	V
Petaurus australis	Yellow-bellied Glider	V
Petaurus norfolcensis	Squirrel Glider	V
Petrogale penicillata	Brush-tailed Rock-wallaby (unlikely)	E1
Pteropus poliocephalus	Grey-headed Flying-fox	V
Pyrrholaemus sagittatus	Speckled Warbler	V
Scoteanax rueppellii	Greater Broad-nosed Bat	V
Stagonopleura guttata	Diamond Firetail	V
Xanthomyza phrygia	Regent Honeyeater	E1
Dasyurus maculatus	Spotted-tailed Quoll (unlikely)	V

Dasyurus viverrinus	Eastern Quoll (unlikely)	E1

Source: Atlas of NSW Wildlife Search June 2007

All remnant vegetation communities within Fairfield City are listed under Schedule 1 of the NSW *Threatened Species Conservation Act 1995* as Endangered Ecological Communities (EECs). The community names and respective areas within, and proportions of, the City is outlined below in Table 3.

Table 3: EECs listed under the NSW TSC Act in Fairfield CITY

DECC Mapped Vegetation Community Name	Endangered Ecological Community Name	Hectares	% CITY Cover
Shale Plains Woodland*	Part of Cumberland Plain Woodland EEC	505.127	4.97
Shale/Gravel Transition Forest	Shale/Gravel Transition Forest	12.228	0.12
Alluvial Woodland	River-Flat Eucalypt Forest on Coastal Floodplains	370.298	3.65
Riparian Forest	River-Flat Eucalypt Forest on Coastal Floodplains	25.236	0.25
Western Sydney Dry Rainforest	Western Sydney Dry Rainforest	0.802	0.008
Moist Shale Woodland	Moist Shale Woodland	13.21	0.13
Turpentine-Ironbark Forest*	Turpentine-Ironbark Forest	1.995	0.02
Cooks River Castlereagh Ironbark Forest	Cooks River Castlereagh Ironbark Forest	70.697	0.70
Castlereagh Swamp Woodland	Castlereagh Swamp Woodland	3.034	0.03
Shale Hills Woodland*	Part of Cumberland Plain Woodland EEC	396.336	3.90
Total		**1398.963**	**13.778**

*Also listed under the EBPC Act
Source: Updated Vegetation Mapping 2007 (ELA, 2007)
Notes: Percentage (%) cover based on CITY size of 10159 hectares.
Gardens, plantings and non-classified native vegetation is included in calculations.

3.2.4 Regional

Species of regional significance refer to the flora and fauna species that are not identified on national or state legislation and therefore not specifically protected. The Urban Bushland Biodiversity Study (UBBS) identified and documented these species within the Fairfield City.

3.2.5 Local

Council bush regeneration activities have identified a number of plant species that have local significance due to rarity and numbers. It is proposed to develop a rare plants of Fairfield listing and for this information to be published on Council's web site. New information will be added to the data base of native vegetation as species are identified. There are two locally significant animals that use a wetland along Prospect Creek within Holroyd Council and thus may also use other parts of the creek within Fairfield City boundaries. These are the locally rare:

- Swamp moorhen *Gallinula tenebrosa* and
- Night Heron *Nycticorax caledonicus* (Source: Man*idis Roberts, 2004)*.

In addition, although there are no threatened fish species listed under the FM Act recorded in the Fairfield City, there are a number of native fish species that, are found to utilise the creeks within the City. These species include

- Long-finned Eel *Anguilla australis*

- Short-finned Eel *Anguilla reinhardtii*
- Striped Gudgeon *Gobiomorphus australis*
- Big-headed Gudgeon, Bull Head, Bull-headed Gudgeon *Philypnodon grandiceps*
  (Source Bionet Search 4 July 2007)

4. Threats to Biodiversity in Fairfield City

Threats to the biodiversity in Fairfield City reflect the urban nature of the eastern part of the City and the semi-rural land use in the west of the City. Some of these threats are identified as 'Key Threatening Processes' in the *NSW Threatened Species Conservation Act 1995* (TSC Act), *NSW Fisheries Management Act* (FM Act) or the Commonwealth (EPBC Act). However, there are a range of other factors that have an important effect on biodiversity. These need to be identified in order to implement a management program to mitigate, control or otherwise respond to these effects.

It should be noted that there is considerable overlap in the State and Commonwealth sets of key threatening process. All three pieces of legislation provide for the development of Threat Abatement Plans, which set out a process and set of actions for mitigating, reducing or eliminating the threat or the impacts of the threatening process.

4.1 Key Threatening Processes

More detail on each of the key threatening processes (state and commonwealth) can be found in the determination reports. These reports provide full details about the nature of the threatening process and the species or communities threatened. Links for these documents are below.

NSW Key Threatening Processes
http://www.threatenedspecies.environment.nsw.gov.au
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_PAS_New.aspx

Commonwealth Key Threatening Processes
http://www.deh.gov.au/biodiversity/threatened/index.html or
http://www.deh.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl

Key threatening processes listed under the Commonwealth EPBC Act that are relevant in the Fairfield City include land clearance, predation by feral cats, and competition and land degradation by feral rabbits. There are a series of other threats such as dieback caused by *Phytophthora, i*nfection of amphibians with chytrid fungus, loss of climatic habitat, and predation by Fox.[1] These threats may be contributing to the decline in biodiversity, however appear to be secondary.

[1] Source: http://www.deh.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl 3 July 2007.

Key threatening processes as defined by the TSC Act are the processes that threaten, or could threaten, the survival or evolutionary development of species, populations or ecological communities. The key threatening processes from Schedule 3 of the TSC Act that are known to impact on biodiversity in the Fairfield City are similar to those listed in the EBPC Act and include[2]:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands
- Clearing of native vegetation
- Invasion and establishment of exotic vines and scramblers
- Invasion of native plant communities by exotic perennial grasses
- Predation by *Gambusia holbrooki*
- Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)

Threatened processes that may also contribute to a decline in biodiversity within Fairfield, but that are considered secondary, include[3]:

- Anthropogenic Climate Change
- Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)
- Competition from feral honey bees, *Apis mellifera*
- Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments
- High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
- Infection by *Psittacine Circoviral* (beak and feather) Disease affecting endangered psittacine species and populations
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Infection of native plants by *Phytophthora cinnamomi*
- Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)
- Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. lat)
- Predation by the European Red Fox *Vulpes vul*pes (Linnaeus, 1758)
- Removal of dead wood and dead trees

In the case of the FM Act, to be listed, a process must adversely affect at least two listed threatened species, populations or communities or could make others become threatened. Within Fairfield City, there are no recorded threatened fish species listed under the FM Act. Therefore, factors likely to make native fish threatened are relevant. As such the key threatening processes listed under the NSW Fisheries Management Act relevant to Fairfield include[4]:

[2] From Schedule 3 of the TSC Act listed at 3 July 2007, http://www.legislation.nsw.gov.au/viewtop/inforce/act+101+1995+FIRST+0+N

[3] Ibid

[4] From Schedule 6 of the FM Act listed at 3 July 2007 http://www.legislation.nsw.gov.au/maintop/scanact/inforce/NONE/0

- Predation, habitat degradation, competition and disease transmission by the introduction of fish to fresh waters within a river catchment outside their natural range
- The removal of large woody debris from NSW rivers and streams
- The degradation of native riparian vegetation along New South Wales water courses
- In-stream structures and other mechanisms that alter natural flow. These structures include a number of weirs and pipelines crossings which are generally owned by public authorities and should be removed over time as funds become available.

4.2 Specific threats

In addition to the key threatening processes listed above there are a range of generic threats to biodiversity which Council can have a major role in managing. Some of these are mentioned in the 2005-2006 State of Environment Report (FCC, 2006) outlined in more detail below.

4.2.1 Land Clearing

Clearing of vegetation poses the greatest threat to biodiversity in the City. Vegetation clearing is listed as a key threatening process under State and Federal legislation. Vegetation clearing removes species, destroys habitat and food resources for a wide range of species, not only those that would live permanently in the vegetation but also those that rely on it for food and shelter seasonally or during crisis times. Land clearing also destroys or alters ecological process relating to or dependent on hydrology and soil composition. Land clearing can also cause salinity and increase flooding. On a large scale land clearing has been shown to change weather patterns and may contribute to global warming and reduced rainfall.

The remaining remnant native vegetation within the City has been classified as one of a number of endangered ecological communities under the *Threatened Species Act 1994*. Currently it is illegal to clear vegetation within the City without Councils consent.

Council conducts a range of activities within parks and the riparian corridors to protect and conserve native vegetation. These activities includes protection of public areas used for recreation using a range of bush regeneration techniques. Bush regeneration will be conducted in a manner that continues to provide for public access into these areas over the long term.

4.2.2 Noxious and environmental weeds

Weeds are classified as noxious under NSW legislation primarily because of their impacts, typically on agriculture. Many declared noxious weeds, as well as environmental weeds, can negatively impact on biodiversity, by degrading or

destroying habitat, competing with native species or by providing inappropriate foods for fauna.

Council has a significant role in the management and control of noxious weeds. Owners are required to control declared noxious weeds on their property. Council is the local weed control authority and has the right to enter and inspect private properties and if required impose notices to carry out control work. Fines may also be applied. The noxious weed list for Fairfield City Council can be viewed at www.dpi.nsw.gov.au/agriculture.

Council recognises that there are local weeds that are not included on the noxious weeds list. Council has created an environmental weeds list as a response to the perceived gap and has provided guidelines for the removal of weeds. Current programs include the control of:

- Alligator Weed (in stream)
- Blackberry
- Green Cestrum
- Castor Oil
- Lantana
- Vines and Creepers (such as Bridal Creeper, Madiera, Balloon and Morning Glory)

4.2.3 Feral animals

Feral animals are a threat to biodiversity for one or more of the following reasons:

- they are predators to native species
- they compete with native species for food and habitat
- they destroy or damage native species habitat
- they spread diseases that impact on native species

Pest species recorded in the City include:

- Rabbits
- Cats
- Foxes
- Indian minors
- European bees,
- European Wasps
- Gambusia

Council has a role in the management of pest species through involvement with control programs and by restricting some potential pest species in some areas. For example councils can restrict (through DA consent conditions or in EPIs) the keeping of domestic pets in some places if they are a potential threat to native wildlife.

4.2.4 Stormwater Run-off

Pollutants and sediments found in stormwater runoff can have detrimental effects on aquatic organisms such as macro-invertebrates, fish, bacteria and microphytes. A decline in aquatic ecosystem health can lead to a reduction in

water quality. These impacts are proposed to be addressed through stormwater management and the roll out of water sensitive urban design (WSUD) principles in planning approvals and council operations.

4.2.5 Dumping of Rubbish, soil and plant matter

Dumping of rubbish, soils and garden wastes in areas of remnant vegetation has the potential to increase noxious and weed species and smother seeding growth of native species.

Illegal dumping of garden waste including grass clippings and other material is a significant problem in the many parks within the urban areas. Grass and other exotic garden materials contributes to weed infestation and needs to be controlled.

4.2.6 Understorey clearing and Incremental edge clearing

Mowing and incremental clearing at the edges of remnant native vegetation within the City has the potential to reduce the extent of EEC's, disrupt native plant colonisation and create conditions favourable to the invasion of weed species.

4.2.7 Track proliferation

The push for recreational space in Western Sydney is highlighted by the creation of the Western Sydney Parklands within Fairfield City. The remaining remnant native vegetation within the City also suffers from in varying degrees tracks from mountain bikes, motor bikes, walkers and in some instances vehicles. These tracks are a typically informal and unmanaged and as such are a source of weeds and erosion. Control of access to public space will need to be carefully considered to ensure conservation objectives are achieved however conservation will always be considered view a view to maintaining public access to public land.

4.2.8 Fire Regimes

Changed fire regimes as a result of wildfire or poorly planned controlled burns can have a detrimental effect on the diversity and quality of vegetation, resulting in changes to dominant species and community species composition. Changed fire regimes can also lead to a predominance of fire dependant species, increased fire frequency, weed invasion, soil erosion and unnecessary air pollution (Webb, 1996). Furthermore, provision of asset protection zones, required under Section 117(2) Direction G20 - Planning for Bushfire Protection of the NSW *Rural Fires and Environmental Assessment Legislation Amendment Act 2002*, can have considerable environmental impacts. The recently updated Planning for Bushfire Protection (2006) document provides guidelines to council in regards to bushfire protection measures and planning controls for subdivisions.

Research on the Cumberland Plain and for other Coastal Woodlands (Watson 2005) suggests that fire frequencies from 2-5 years are required for some communities. In such cases, too infrequent fire regimes may be increasing shrub species prevalence and influencing communities once typically grass dominated.

4.2.9 Other threats

Other threats to biodiversity which Council have a less direct role in the management off can include such things as:

- Water pollution
- Changed hydrology
- Soil and air pollution
- Salinity
- Nutrification
- Erosion and sedimentation
- Drought
- Disease
- Road kill
- Illegal hunting and gathering
- Climate change

These issues have been considered in preparation of the strategies outlined in Section 9.

5. Data Audit

A large amount of digital data (maps and databases) relevant to the area exists. An audit of this information was undertaken and a database of baseline information compiled. The relevant baseline information was incorporated into a model to produce a single GIS layer to indicate conservation values (See Section 7). The following table lists the data that was compiled, a description of the data, any limitations of the data, its source and currency.

Table 4. Results of data audit

Name	Description	Gaps in data/Limitations	Source, Currency (Date)
Vegetation Mapping	Mapping is based on Western Sydney mapping (NPWS 2002), updated using API 2007 by ELA. Please refer to Report titled *Fairfield Vegetation Mapping Update Report,* by Eco Logical; Australia *(2007)*.	Data was updated using Aerial photographic interpretation (API) to refine vegetation mapping boundaries. Roadside vegetation was identified during the Connectivity Workshop on June 12 and added as plantings in the mapping. Ground truthing is needed to verify remnant vegetation communities and condition.	2007
Riparian buffer	Major rivers and tributaries within the CITY supplied by DNR. This layer was refined using council 'Creek Corridors Baseline Map' to eliminate streams mapped over urban areas. Streams were categorised by DNR (1,2,3) and buffered at 40m, 20m and 10m respectively (using centre of river line data and NOT top of bank).	The DNR categories were assigned by DNR using in most cases API and position of streams in the catchment. The area of riparian buffers is underestimated due to being measured from stream centreline rather than top of bank. It should only be used for broad-scale strategic purposes. Further refined data should be used once available (e.g. from Urban Creek Masterplan project).	DECC (formerly DNR) (Jann Grose) Currency unknown, Council 2007.
DECC Estate	DECC Estate gazetted boundaries (e.g. National Parks, State Conservation Areas)	Data was not interrogated.	DECC, 2006
Acid Sulfate Soils	Council based mapping sourced from previous Department of Natural Resources (DNR).	Data was not interrogated.	Supplied by Council 2007
Flora and Fauna Threatened Species	Recorded occurrences of Threatened Species within the City from Atlas of NSW Wildlife.	Some species considered unlikely to currently occur within the City. Data was therefore not used in the Conservation Significance Assessment. EPBC Act Protected Matters database searches do not provide the locations of threatened species within the City.	DECC Atlas of NSW Wildlife website 2007, EPBC website 2006, State of Environment Report 2004

Name	Description	Gaps in data/Limitations	Source, Currency (Date)
Predicted use of vegetation by TS	Threatened Species habitat was predicted using a combination of threatened species sightings and vegetation communities. Atlas of NSW Wildlife data was obtained for the City and surrounds (approximately within 5km of the City) in May 2007. The threatened species were then assessed one-by-one for every patch of vegetation taking into account the community, patch size and condition to estimate whether it was likely to use that patch either for foraging, breeding or roosting. This assessment was conducted in a limited time frame and is thus only indicative.	Data needs to be verified, preferably with targeted on ground surveys.	Eco Logical Australia, 2007
Western Sydney Parklands- SREP 31 Boundaries	Based on cadastral data, indicates area covered by SREP 31- Western Sydney Regional Parkland Zone.	Data was not interrogated.	Supplied by Council 2007
Urban Area	Created using SREP31 boundaries and Fairfield City Council boundary to indicate urban areas to the east of the SREP 31 boundaries.	Arbitrarily considered all land east of Cowpasture Road. It is acknowledge that much of the area in the north of the City along Prospect Ck has a commercial land use.	Eco Logical Australia, 2007
Semi-rural Area	Created using SREP31 boundaries and Fairfield City Council boundary to indicate semi rural areas to the east of the SREP 31 boundaries.	Part of this land is subject to the NSW State Governments Employment Lands Strategy which is not reflected in the characterisation – semi rural.	Eco Logical Australia, 2007
DECC 2008 Rapid Fauna Habitat Assessment SMCMA	Habitat significance has been assessed based upon habitat connectivity, habitat condition, canopy structural attributes, patch size and the presence of fauna attributes.	Several sites are included in Fairfield which are outside the control of Fairfield Council. The data contained within the report have not been interrogated.	DECC 2008

6. Conservation Significance Assessment

The term Conservation Significance Assessment for this strategy has been based upon the work conducted by the NSW National Parks and modified to meet the local conditions in Fairfield. A series of maps has been prepared for this strategy and these maps identify areas based upon this classification. The classification system uses 3 levels High, Moderate and Low with the High classification representing areas with the greatest conservation significance. It is expected that the local CSA values will be used in assessment of future test of significance required by state legislation.

6.1 Update of Conservation Significance Assessment

A Conservation Significance Assessment (CSA) was conducted in 2002 by the NSW NPWS for western Sydney. This CSA was used the 1997/1998 western Sydney (Cumberland Plain) vegetation mapping as a base for the assessment (NPWS 2002a). This base vegetation mapping has been updated as part of this project, the CSA in turn needs to be updated to reflect the changes in extent and condition.

The CSA process enables a number of habitat values to be evaluated, resulting with a map indicating conservation priority for each vegetation patch. The methodology used is based on the process set out in the Guidelines for the Conservation Significance Assessment of the Native Vegetation for the Cumberland Plain (NPWS, 2002b) and has been modified to address the small remnant sizes within the Fairfield City and the presence of known threatened species sightings as indicated through the NSW Wildlife Atlas.

6.2 Fairfield CSA Model

Conservation significance is determined by a combination of:

- Updated Vegetation Boundaries
- Community status (eg EEC)
- Patch condition (Table 6)
- Patch size
- Adjacency
- Known threatened species locations (Table 7)

This strategy is substantially based upon work undertaken by
Eco Logical Australia Pty Ltd Ph - (02) 8536 8600 Fax - (02) 9542 5622

For a detailed description of this mapping process please refer to the ELA report 'Updating Vegetation Mapping in Fairfield City' prepared for Fairfield City Council (2007). The following is a summary of that report.

6.3 Update of Vegetation Boundaries

The current vegetation mapping used has been derived from the mapping of Native Vegetation of Western Sydney (Cumberland Plain) produced between 1999 and 2001 by the NSW National Parks and Wildlife Service (NPWS) (NPWS, 2002). This regional scale mapping was generated from aerial photograph interpretation (API) and predictive modelling of vegetation communities. Aerial photographs used for this interpretation were flown between 1997 and 1998. This mapping was further refined in the Fairfield City in 2003/04 by Eco Logical Australia who conducted field ground truth work of some of this mapping, collecting information on disturbance and taking photo points at selected sites. This information was used to update the extent and condition of native vegetation across the City and to help better inform decisions regarding management of Endangered Ecological Communities on both public and private land.

In the current project, the previously refined vegetation boundaries mapped were further updated by comparing it with the 2005 aerial photographs. The mapping was updated using ArcGIS 9.2 software, and on-screen digitising at a scale of 1:6,000. Vegetation polygons were added where the aerial photo showed vegetation occurring outside the area of mapped vegetation. Where vegetation was mapped, but was missing in the 2005 photos, it was removed from the vegetation mapping, the assumption being it had been removed since 1997/98. Refinements to the edges of polygons were also conducted to make the mapping more accurate.

6.4 Condition

Field validation of condition was undertaken on public lands in Fairfield in 2002. In cases where vegetation polygons were added, the structural condition (See Table 5 below) of the vegetation was determined based on the visible density and appearance of the canopy in the aerial photographs. Vegetation communities need to be assessed on ground and thus could not be determined from the aerial photography and so the added polygons were annotated as "Not Confirmed". Vegetation in urban areas in poor condition (condition TXU) was excluded from all analysis and updating.

Table 5: Assessment of vegetation condition based on canopy density.

Condition ID	Canopy Density	Description
A	>10%	Canopy and understorey in good condition
B	5-10%	Canopy thinner, some understorey
C	>10%	Do not have Eucalypt canopy cover. Understorey appears dominated by native vegetation cover
Cmi	>10%	Similar to C, but with understorey not dominated by natives, extensive weeds present in understorey.
TX	<10%	Scattered tree overstorey over agriculture (Grazing paddocks)
TXR	<10%	Scattered tree overstorey over rural residential development
TXU	<10%	Scattered trees over urban development
P	Any	Planting. Usually exotics or non-local natives. Includes revegetation, unsure whether local or non local native species.
G	Any	Garden or landscaping associated with house/office etc. Usually exotic or non-local native dominated. Clearly planted vegetation
R	Any	Revegetation with native species.

6.5 Patch Size

A patch is defined as a contiguous patch of vegetation of similar condition. Patch area was measured in ArcGIS 9.2 by grouping all vegetation with similar condition that was directly adjoined, see Table 6 below. The Fairfield CSA model and patch size limit, draws upon CSA models used by DECC in their 2002 vegetation mapping of the Cumberland Plain, Sydney Growth Centres Conservation Strategy, Western Sydney Parklands Conservation Strategy.

This strategy is substantially based upon work undertaken by
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Table 6: Condition Grouping for Patch size

Condition Grouping	Community Condition
Good	A, B, C, Cmi
Poor	TX, TXR,
Other Vegetation	TXU, P, G, R

6.6 Threatened Species Locations

All flora species identified within the City listed under the TSC and EBPC Act were included in the CSA as were sedentary fauna species. Mapped locations were buffered for a distance of 10m to allow for the minimum data capture accuracy. Species included in the assessment are identified in the Table 7 below.

Table7: Threatened species and populations included in Fairfield CSA

Scientific name	Common Name	Legal Status
Acacia pubescens	Downy Wattle, Hairy Stemmed Wattle	Critical – TSC, EPBC
Cynanchum elegans	White-flowered Wax Plant	Endangered – TSC, EPBC
Grevillea parviflora subsp. *parviflora*		Vulnerable - TSC
Persoonia nutans		Endangered – TSC, EPBC
Pimelea spicata		Endangered – TSC, EPBC
Pomaderris brunnea	Rufous Pomaderris	Vulnerable - EPBC
Marsdenia viridiflora subsp. *viridiflora*		Endangered Population - TSC
Eastern Pygmy-possum	Cercartetus nanus	Vulnerable - TSC
Green and Golden Bell Frog	Litoria aurea	Endangered – TSC
Cumberland Plain Land Snail	Meridolum corneovirens	Endangered – TSC
Grey-headed Flying-fox	Pteropus poliocephalus	Vulnerable – TSC, EPBC

6.7 Adjacency

A distance of 15 metres was used to determine if vegetation polygons were close enough to be considered as being adjacent. This meant that if vegetation polygons were separated by a small path or track, but still share ecological values, can be considered together.

The choice of 15 meters to measure adjacency was also based on a number of assumptions. The distance of 15 meters was considered a small enough barrier to enable a range of species to move across it and to allow seed dispersal, but was large enough that major roads and other large barriers to movement were not included.

Vegetation polygons were considered to be adjacent if they were of different condition but not greater than 15 metres apart.

The CSA was carried out using the above variables in a rule set (see Table 8) using a step by step model using ArcGIS 9.2. The final result of the CSA groups vegetation as either: High, Moderate or Low.

These areas have been reviewed by a site visit to confirm the allocated classification. It should be noted that changes over time may lead to the classification being modified to more closely reflect current conditions on an individual site.

Table 8: Regional Conservation Significance Assessment Matrix

Community	Condition Code	Patch Size	Connectivity	Specific Threatened Species Location	Code	Conservation Significance
Important Endangered Ecological Community ("IEEC")▲	ABCCmi, TX or Txr	Any	Any	N/A	C1	High
	Txu	Any	Any	Present	C2	High
				Absent	C3	Moderate
Endangered Ecological Community ("EEC")	ABCCmi	>= 4 ha	Any	N/A	C4	High
		2-4 ha	Adjacent to C1, C2, or C4	N/A	C5	High
			Not adjacent to C1, C2, or C4	Present	C6	High
				Absent	C7	Moderate
		<= 2ha	Adjacent to C1, C2, C4, C5, C6	N/A	C8	High

Community	Condition Code	Patch Size	Connectivity	Specific Threatened Species Location	Code	Conservation Significance
			Not adjacent to C1, C2, C4, C5, C6	Present	C9	High
				Absent	C10	Moderate
	TX or Txr	>= 4 ha	Any	N/A	C11	High
		2-4 ha	Adjacent to C1, C2, or C4, C5, C6, C8, C9, C11	N/A	C12	High
			Not adjacent to C1, C2, or C4, C5, C6, C8, C9, C11	Present	C13	High
				Absent	C14	Moderate
		<= 2 ha	Adjacent to C1, C2, C4, C5, C6, C8, C9, C11, C12, C13	N/A	C15	Moderate
			Not adjacent to C1, C2, C4, C5, C6, C8, C9, C11, C12, C13	Present	C16	Moderate
				Absent	C17	Low
	Txu	Any	N/A	N/A	C18	Low
Other Plantings	P, G, R	Any	N/A	N/A	C19	Low

▲ IEEC – Important Endangered Ecological Community are communities identified as 'Critically Endangered Ecological Communities' within the conservation significance assessment of the native vegetation of the Cumberland Plain, Western Sydney (NPWS 2002b). In 2004 the *Threatened Species Legislation Amendment Act (2004)* created the official listing of 'critically endangered' communities. Whilst none of IEEC have been officially listed as ''critically endangered' communities' their importance is recognised through their IEEC status.

▲▲ The NSW Scientific Committee has commenced a review of the CPEEC to determine if the listing should be increased to Critically Endangered Community.

6.8 Riparian Corridors and Connectivity

Riparian land provides a number of important environmental services and other values including:

- a diversity of habitat for terrestrial, riparian and aquatic species;
- food for aquatic and terrestrial fauna;
- movement and recolonisation of plant and animal species and populations;
- shading and temperature regulation;
- conveyance of flood flows;
- settlement of high debris loads;
- reduction of bank and channel erosion through root systems binding the soil;
- water quality maintenance through the trapping of sediment, nutrients and other contaminants;
- an interface between development and waterways;
- passive recreation;
- visual amenity; and
- a sense of place with green belts naturally dividing localities and suburbs.

Riparian Corridor Management Studies (RCMS) involve setting management objectives and mapping riparian lands. This approach was originally developed by the DIPNR South Coast Region for a Riparian Corridor Management Study (DIPNR 2004) produced for the Wollongong City and Calderwood Valley in the Shellharbour City.

The RCMS originally classified the creeks within Fairfield into three categories however an updated application for riparian areas has replaced DIPNRs categorisation of watercourses (ie: Category 1, 2 and 3). These are described in the table below.

Table 9: DNR Creek Categorisation

Category	1	2	3
Stream Order	3	2	1
Aquatic Ecosystem Condition	High to Moderate	Moderate	Low
Existing or Potential connectivity	Regional connection within stream length.	Local connection within stream length	Study area connection within stream length
Potential for corridor maintenance – reinstatement or restoration	High	Medium	Low
Riparian Buffer Width	40m either side	20m either side	10m either side
Description	Environmental Corridor	Terrestrial and Aquatic Habitat Corridor	Bend and Bank Stability and Water Quality Corridor

This approach is also being implemented by DECC or DWE in the North West and South West Growth Centres of Sydney, and on the South Coast Region.

The principles of the RCMS have also been included in the 2004 version of *Managing Urban Stormwater: Soils and Construction*. This manual is produced by Landcom and more commonly known as the "Blue Book".

These buffer widths and classifications have been previously mapped for Fairfield by the former Department of Natural Resources [now Department of Water and Energy (DWE)] and are included in this assessment and strategy but not in the formulation of the CSA.

The table below provides the DWE new classification under the Water Management Act 2000 (WM Act).

Table 10: Water Management Act CRZ Widths

Types of Watercourses	CRZ Width
any first order[1] watercourse and where there is a defined channel where water flows intermittently	10 metres
• any permanent flowing first order watercourse, or • any second order[1] watercourse and where there is a defined channel where water flows intermittently or permanently	20 metres
Any third order[1] or greater watercourse and where there is a defined channel where water flows intermittently or permanently. Includes estuaries, wetlands and any parts of rivers influenced by tidal waters.	20 – 40 metres[2]

[1] as classified under the Strahler System of ordering watercourses and based on current 1:25 000 topographic maps

[2] merit assessment based on riparian functionality of the river, lake or estuary, the site and long-term land use.

6.9 Limitations of CSA

6.9.1 Surrogacy

The extent of native vegetation is unlikely to be the best surrogate for biodiversity. It has been demonstrated that vegetation type and condition only captures a subset of diversity of plants and animals that occurs in a region (Doherty *et al* 2000).

It is important to base decisions on a more diverse range of biological information such as rarity, security and ecosystem processes occurring in the region. The role of vegetation mapping is thus as base information, upon which further meaning is added to provide a more comprehensive idea of biodiversity values.
Such an approach is represented for Fairfield City's Biodiversity Strategy by a model of conservation significance, described in the next section.

6.9.2 Condition

Native vegetation may be modified to varying degrees by land management practices and unplanned threats and disturbances. The impacts include changes to the structure, function and species composition of vegetation, reduced regeneration, and a lowering of habitat values and integrity (DECC, 2006). Decline in vegetation condition is generally less visible than clearing and occurs over a longer time frame. Vegetation condition was assessed for Cumberland Woodland mapping, however the data may need to be updated over time as condition may have been improved in some patches due to revegetation and bush regeneration works. The condition needs to be thus validated using ground-truth techniques.

6.9.3 Accuracy

The limitations in the accuracy and reliability of the vegetation mapping used are detailed in the relevant reports (NPWS 2002). The vegetation mapping in this report can be used to trigger assessment approaches and management plans, however it should not be used as a replacement for on-ground assessment when making final decisions.

Atlas data used for known threatened species locations also can contain errors. Predictive habitat modelling was indicative only (See **Appendix D**) and subject to detailed field investigation to become rigorous enough to use in a planning document or as the basis for zoning. In the light of no other suitable data being available, known threatened species records were used. Specific sites considerations will need to be assessed where anomalies are identified.

6.9.4 Recovery Potential

Due to the highly urbanised nature of the City, recovery potential has not been included in this assessment. Recovery potential will be addressed through the Urban Creeks Master Plan and will adopt an approach that conservation and protection activities will focus upon areas with the highest existing conservation values rather than allocating resources too widely and risk a potential overall reduction in conservation quality of the "best" areas.

6.10 Results

The results of the conservation significance assessment can be displayed in a number of ways. These are outlined in the tables below and include:

- Number of hectares per conservation significance
- Vegetation communities within different parts of the City (Semi rural, urban, WSP)
- Conservation significance for each community within Public Land
- Conservation significance within riparian zones
- Conservation significance and vegetation communities in different parts of the City

These results are displayed in the following tables. A summary of key findings is provided following the presentation of statistical data. **Figure 2** illustrates the spatial extent of these conservation categories.

Table 11: Number of hectares per conservation significance

Conservation Significance	Total Hectares	% of CITY
High	844.08	8.31%
Moderate	282.93	2.78%
Low	452.61	4.46%
Total	1579.61	15.55%

Note: this includes 577ha in Western Sydney Parklands within Fairfield City.

Table 12: Area (ha) and Percentage of conservation significance in Described areas of the City

Area	High Conservation Value (HCV)		Moderate Conservation Value (MCV)		Low Conservation Value (LCV)		Total	
	ha	%	ha	%	ha	%	ha	%
Urban	219.13	3.26	123.67	1.84	277.08	4.12	**619.87**	**9.21**
Semi-rural	179.90	10.17	90.87	5.14	111.53	6.31	**382.30**	**21.62**
Western Sydney Parklands	445.05	26.77	68.39	4.11	64.00	3.85	**577.44**	**34.73**

Table 13: Conservation significance within Riparian Zones

Conservation Significance	Vegetated Areas within Riparian Categories (ha)			Total Ha
	Cat 1	Cat 2	Cat 3	
High	104.46	26.61	1.17	132.24
Moderate	24.73	20.36	1.68	46.77
Low	3.94	13.47	1.39	18.80
Total ha	133.13	60.44	4.24	197.80
Vegetated Riparian Area	316.73	142.26	12.06	471.06
Percent of Vegetated Riparian Area	**67.24%**	**30.20%**	**2.56%**	**100 %**

Note: Not are areas within the riparian zone are vegetated.

Table 14: Vegetation communities within different parts of the City

Vegetation Community	Semi-rural Area	Urban Area	Western Sydney Parkland Area	Total Hectares	% CITY Cover
Shale Plains Woodland	121.82	246.09	137.15	505.06	**4.97**
Shale/Gravel Transition Forest		12.23		12.23	**0.12**
Alluvial Woodland	67.85	223.49	78.94	370.28	**3.64**
–Riparian Forest		25.24		25.24	**0.25**
–Western Sydney Dry Rainforest			0.80	0.80	**0.008**
Moist Shale Woodland			13.21	13.21	**0.13**
Turpentine-Ironbark Forest		2.00		2.00	**0.02**
Cooks River Castlereagh Ironbark Forest		70.70		70.70	**0.70**
Castlereagh Swamp Woodland		3.03		3.03	**0.03**
Shale Hills Woodland	145.58	7.51	243.22	396.32	**3.90**
Garden	22.40		0.06	22.46	**0.22**
Not confirmed	16.20	8.12	100.85	125.17	**1.23**
Plantings	8.45	21.46	3.20	33.11	**0.33**
Total	**382.30**	**619.87**	**577.44**	**1579.61**	**15.55**

Table 15: Conservation significance for each community within Public Land (Crown land) and WSP

Vegetation Community	Conservation Significance within Public Land			Total Ha	Conservation Significance within WSP			Total Ha
	High	Moderate	Low		High	Moderate	Low	
Shale Plains Woodland	17.00	22.52	35.37	**74.89**	104.85	16.95	15.37	**137.17**
Shale/Gravel Transition Forest	11.42		0.11	**11.54**				
Alluvial Woodland	93.23	32.17	26.65	**152.05**	68.36	7.50	3.08	**78.94**
–Riparian Forest	0.84		0.85	**1.69**				
Western Sydney Dry Rainforest					0.80			**0.80**
Moist Shale Woodland					13.21			**13.21**
Turpentine-Ironbark Forest	3.05			**3.05**				
Cooks River Castlereagh Ironbark Forest	23.01	1.57		**24.58**				
Castlereagh Swamp Woodland	0.65	0.05		**0.70**				
Shale Hills Woodland	2.45		0.48	**2.93**	183.00	33.51	26.72	**243.23**
Garden							0.06	**0.06**
Not confirmed		2.74	3.88	**6.63**	74.83	10.44	15.58	**100.85**
Plantings			16.57	**16.57**			3.20	**3.20**
Totals	**151.66**	**59.05**	**83.92**	**294.63**	**445.05**	**68.39**	**64.00**	**577.44**

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Table 16: Conservation significance and vegetation communities in different parts of the City

Conservation Significance	Vegetation Community	Semi-rural Area		Urban Area		Western Sydney Parkland Area		Conservation Significance Total
		ha	%	ha	%	ha	%	ha
High	10 - Shale Plains Woodland	57.97	30.67	26.19	13.86	104.85	55.47	189.01
	103 - Shale/Gravel Transition Forest			6.10	100.00			6.10
	11 - Alluvial Woodland	42.35	17.94	125.32	53.09	68.36	28.96	236.03
	12 - Riparian Forest			19.25	100.00			19.25
	13 - Western Sydney Dry Rainforest					0.80	100.00	0.80
	14 - Moist Shale Woodland					13.21	100.00	13.21
	15 - Turpentine-Ironbark Forest			2.00	100.00			2.00
	3 - Cooks River Castlereagh Ironbark Forest			34.68	100.00			34.68
	4 - Castlereagh Swamp Woodland			1.60	100.00			1.60
	9 - Shale Hills Woodland	78.87	29.66	3.99	1.50	183.00	68.83	265.86
	Garden							
	Not confirmed	0.71	0.95			74.83	99.05	75.54
	Plantings							
	Total	**179.90**	**21.31**	**219.13**	**25.96**	**445.05**	**52.73**	**844.08**
Moderate	10 - Shale Plains Woodland	35.10	40.03	35.63	40.63	16.95	19.33	87.68
	103 - Shale/Gravel Transition Forest			0.87	100.00			0.87
	11 - Alluvial Woodland	19.30	26.88	45.01	62.68	7.50	10.44	71.81
	12 - Riparian Forest			2.73	100.00			2.73
	13 - Western Sydney Dry Rainforest							
	14 - Moist Shale Woodland							
	15 - Turpentine-Ironbark Forest							
	3 - Cooks River Castlereagh Ironbark Forest			36.02	100.00			36.02
	4 - Castlereagh Swamp Woodland			1.44	100.00			1.44
	9 - Shale Hills Woodland	26.56	44.02	0.27	0.45	33.51	55.53	60.34
	Garden							
	Not confirmed	9.52	43.94	1.70	7.85	10.44	48.21	21.66
	Plantings	0.39	100.00					0.39
	Total	**90.87**	**32.12**	**123.67**	**43.71**	**68.39**	**24.17**	**282.93**
Low	10 - Shale Plains Woodland	28.75	12.59	184.28	80.68	15.37	6.73	228.39
	103 - Shale/Gravel Transition Forest			5.26	100.00			5.26
	11 - Alluvial Woodland	6.20	9.93	53.16	85.13	3.08	4.94	62.44

Conservation Significance	Vegetation Community	Semi-rural Area		Urban Area		Western Sydney Parkland Area		Conservation Significance Total
		ha	%	ha	%	ha	%	ha
	12 - Riparian Forest			3.26	100.00			3.26
	13 - Western Sydney Dry Rainforest							
	14 - Moist Shale Woodland							
	15 - Turpentine-Ironbark Forest							
	3 - Cooks River Castlereagh Ironbark Forest							
	4 - Castlereagh Swamp Woodland							
	9 - Shale Hills Woodland	40.15	57.26	3.25	4.63	26.72	38.11	70.12
	Garden	22.40	99.74			0.06	0.26	22.46
	Not confirmed	5.97	21.34	6.42	22.96	15.58	55.70	27.97
	Plantings	8.06	24.63	21.46	65.58	3.20	9.79	32.72
	Total	111.53	24.64	277.08	61.22	64.00	14.14	452.61
	Grand Total	**382.30**	**24.20**	**619.87**	**39.24**	**577.44**	**36.56**	**1579.61**

Figure 2: Conservation Significance Assessment Map for Fairfield City, Sheet 1 and 2

See Separate sheets 1 East and 2 West attached.

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6.11 Interpretation of Results

The results of the CSA point to a number of findings including:

- The limited extent of conservation values within the City
  - HCV=8.31%,
  - MCV=2.78%,
  - LCV=4.46%,
  - total of the City =15.55% including WSP.
- Over half (57%) of the vegetation communities within the City are Shale derived woodlands (Shale Plain Woodlands and Shale Hills Woodlands).
- Over two thirds (67%) of the vegetation in riparian corridors is of high conversation significance.
- Approximately 31% of HCV woodlands occur in the semi rural areas of the City
- A limited representation of conservation values in Public Lands ~18%.
- Over half (52.72%) of the City's HCV areas within the Western Sydney Parklands.
- Approximately 9% of urban areas contain conservation significance.
- Approximately 20% of the semi-rural areas contain conservation significance.
- Approximately 42% of the HCV outside the Western Sydney Parklands occurs as Alluvial Woodland increasing the need for protection in riparian areas of the City. This area and percentage increases if you include Riparian Forests and Swamp Woodlands (47%).
- Over half (61.21%) of the City's LCV areas are within urban areas
- Approximately 40% of classified riparian buffers contain significant remnant vegetation (HCV, MCV or LCV).

Generally, there is a concentration of conservation values within the Western Sydney Parklands. This skews the representation of data. These results point to the need to focus on riparian zones within all areas of the City. There is also a dominance of woodland EECs in the semi-rural areas of Fairfield City compared to riparian EECs dominating the urban areas.

6.12 Use of data

Data and information contained within this strategy has been prepared using the best available information. The use of data by other is permitted however location conditions and changes to conservation attributes need to considered at the time the data is being used.

It is a condition of use of data within the strategy that persons or organisations using the data for commercial or academic purposes should provide Council with information where this information would assist Council in maintaining the data up to date.

Use of the mapping files can be obtained by establishment of appropriate licensing agreements for commercial purposes.

7. Fauna Habitat Assessment.

DECC conducted the Rapid Fauna Habitat Assessment of the Sydney Catchment Authority Area (RFHA) and published this report in June 2008. The report identified all areas of remanent bushland within the study area greater than 50 hectares and conducted an audit to identify habitat presence, the threats in existence and listing of native fauna known to occur. The Priority Fauna habitats within the Sydney Metropolitan Catchment Authority area have been considered.

This information was ranked to compile a priority ranking of the sites to establish the priority conservation significance. Conservation significance has been determined using a matrix of variables including connectivity, patch condition, presence of key habitat including tree hollows, the presence of threatened and regionally significant species. The presence of pests and weeds were also considered.

The report has identified 4 major sites in Fairfield with conservation significance and these have been reproduced in Table 17. The RFHA uses 5 classification categories while this strategy has allocated Conservation Significance Assessment using 3 classifications. To maintain consistency throughout this strategy the habitat value from the RFHA has been compared the criteria used for establishing the CSA in this strategy. Table 18 provides the correlation system used to allocate a Habitat CSA for Fairfield

A list of threatened species that are known to have occurred at the sites have been included in Appendix F

Table 17 Priority Habitat Areas – Fairfield City.

Site name	**Relative Area size in CMA and actual size**	**Sub Catchment**	**Local Government Areas**	**Habitat Value**	**Conservation Significance to Fairfield**
Prospect Reservoir	Large (1129 ha)	Prospect Creek - Georges River	Fairfield, Blacktown and Holroyd	Highest	High
Western Sydney regional Parklands	Medium (139ha)	Georges River	Fairfield	Very High	High
Chipping Norton Lakes	Medium (455 ha)	Prospect creek – Georges River	Fairfield, Liverpool and Bankstown	High	Moderate
Mirabeena Regional Park	Small (174)	Georges River	Bankstown and Fairfield	Moderate	Low

Table 18

Habitat Conservation Categorisation *

RFHA Habitat Classification	Patch relativity to CMA	FCC Habitat CSA
Highest	Large or Medium	High
Very High	Large or Medium	High
High	Large, Medium or Small	Moderate
Moderate	Any	Low
Low	Any	Low

- Source: DECC 2008 Rapid Fauna Habitat Assessment of Sydney Metropolitan Catchment Authority Area.

Appendix F contains a list of Threatened Species known to occur in Fairfield City.

Many sites within Fairfield have been excluded from the RFHA as the sites do not meet the minimum patch size requirements. These areas tend to correlate to the

site assessed using the vegetation assessment criteria and the CSA allocated upon this basis. Additional work will be required to collate information currently available and other information as it becomes available to better identify sighting of species and local habitat of significance.

7.1 Fish Habitat.

The Department of Primary Industries has provided comments to Council in relation to the protection of fish habitat and the application of the standard template to create protection zones in line with State Government requirements. This strategy relies upon the advice provided by the Department and has used a combination of zone (W2) and the Local Clause to identify and protect local Fish Habitat.

It has been noted that some of the areas included within the areas covered by the Local Clause include ephemeral creeks and other land areas which are generally dry. This is in accordance with best practise to allow for protection ephemeral creeks that are considered Key Fish Habitat as long as there is potential for significant habitat and the creek is connected to the catchment watercourses. Ephemeral creeks are included to minimise upstream impacts (e.g. sedimentation, water quality) on downstream permanent waterways. Also, Council seeks not only to protect the habitat of fin fish but also that of yabbies, eels and other such organisms. All of these organisms fall under the definition of 'Fish' in the *Fisheries Management Act*.

Appendix G includes detailed comment from the Department of Primary Industries for protection of Fish Habitat and Threatened Aquatic Species.

8. Strategic Planning

The Fairfield Local Environmental Plan (LEP) is the primary planning and land use instrument used by Council. It can be a powerful tool in protecting biodiversity and creating a clear and transparent decision making process. Currently Fairfield Council is undertaking strategic planning work to update the LEP to be compliant with the Standard Instrument (LEP) Order 2006 and this Biodiversity Strategy informs the development of the new LEP.

The planning provisions and mechanisms available in the LEP are discussed in this section in relation to how they can protect the biodiversity values identified within Fairfield City. Generally the following strategic planning approaches are recommended for adoption:

- LEP Review for Fairfield City to use a combination of approaches (ie: zonings, permissibility tables, local clauses and DCPs) to reflect conservation significance
- Update the development approval process to ensure biodiversity issues are addressed at all stages of the site based activity and development

assessment.

- The conservation significance assessment is built into considerations during the development assessment process and community awareness (eg, on Section 149 certificates)
- New employment lands in Horsley Park and any rural area master planning processes to ensure consideration is given to the conservation significance assessment mapping.
- Council to incorporate a Habitat Offsetting Policy into the local provisions of the LEP for cases where impact is unavoidable or permitted.

8.1 Zoning

Under the standard template, Fairfield Council will be required to adopt new zoning codes and structure plan across the City under a new LEP. This Strategy supports new environmental zones, environmental sensitive lands and planning provisions as part of the new LEP.

Zone Options for consideration

E1 – Environmental Protection
Currently there is no land gazetted under the *National Parks and Wildlife Act 1974* outside the Western Sydney Parklands within Fairfield City.

This zone is generally intended to cover existing national parks and nature reserves. The only development that should be permissible in this zone is development authorised under the National Parks and Wildlife Act 1974. All uses currently authorised under the National Parks and Wildlife Act 1974 would continue to be permitted without consent within this zone.

Application to Fairfield.
There is no impact as the Western Sydney Regional Parklands is not covered by the Fairfield LEP. See SEPP (Western Sydney Parklands) 2009 for further information.

E2 – Environmental Conservation
Template objectives:

- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.

Additional Objective:

- Protect and enhance native Flora/Fauna/habitat and biodiversity links throughout landscape.

Application within Fairfield:

- ***E2 is relevant to existing 6a zonings as such lands currently zoned open space containing conservation significance should be transferred to E2.***
- ***This zone includes state significant vegetation such as EECs, threatened species habitat in good condition, high quality riparian lands, groundwater protection, wildlife corridors, remnant vegetation and culturally significant land.***
- ***In Fairfield City this translates to those lands classified as High Conservation Value Conservation Significance Assessment (Section 7) in the riparian corridors. In some areas of lower CSA are included to create conservation corridors.***
- ***It is not anticipated that large tracts of potentially developable land will be included in this zone, nor is it intended to negate existing dwelling entitlements.***
- ***A number of land uses considered to be inappropriate for this zone have been mandated as prohibited uses under the standard instrument. Permitted land uses are limited to those compatible with ongoing retention/enhancement of conservation values of the subject land, eg environmental protection/restoration works, or bushfire hazard reduction works, and only with consent. Limited public recreation activities may also be suitable in where adequate environmental investigations and safeguards are put in place.***
- ***Within Fairfield this zone extends to include riparian lands classified by DNR as Category 1, 2 and 3 streams and be linked to local provisions with performance criteria.***
- ***No trading or offsets permitted.***

E3 – Environmental Management

Template objectives:

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- To provide for a limited range of development that does not have an adverse effect on those values.

Additional Objective:

- To protect and manage land subject to one or more natural hazards, from incompatible land uses (eg Acid Sulphate Soils (ASS), erosion, flooding, scenic protection, salinity, known threatened species habitat).

This zone is generally intended to be applied to land that has environmental or scenic values or hazard risk (e.g. flooding, bushfire prone land), but where a limited range of development including dwelling houses and other uses could be permitted. This zone might also be suitable as a transition between areas of high conservation value and other land uses such as rural residential.

Application in Fairfield City

Scope exists for limited application of this zone to limited areas of the LGA where land has environmental conservation values along with a range of constraints

(e.g. flooding, acid sulphate soils). This matter will be investigated further and discussed with the Dept of Planning under preparation of the Comprehensive LEP.

The following matters will be considered if further advice is provided by the Department in the future.

- This zone may apply to land identified as Medium Conservation Value in the Conservation Significance Assessment . This recommendation is driven by the fact that all remnant native vegetation in Fairfield City is Cumberland Plain derived and therefore part of an EEC.
- Includes Riparian Lands based on stream order classified by DNR as Category 3 and linked to Local Provisions with performance criteria.
- Land uses permissible within this zone should be consistent with protecting and managing environmentally sensitive lands eg environment protection/restoration works and environmental education facilities. There is potential to use minimum lot sizes to control development density.
- Dwellings would be permitted in this zone.
- It is not intended that this zone be applied to very high conservation lands previously identified for development.
- No trading or offsets permitted unless considered to be a social and economic benefit of state significance.

E4 - Environmental Living

Template objectives:

- To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.
- To ensure that residential development does not have an adverse effect on those values.

This zone is generally intended for land with special environmental or scenic values where residential development could be accommodated. Issues of density and design would need to facilitate the protection and management of environmental values

Application in Fairfield City

It is not intended to apply this zone in Fairfield as the Department of Planning has advised that this zone is not applicable to Fairfield at this time.

The following matters will be considered if further advice is provided by the Department in the future.

- This zone provides the opportunity to tie in some provisions that can relate directly back to environmental protection within an urban landscape.
- Conservation Assessment, scenic values and proximity to riparian corridors would need to be analysed across the landscape. Wherever practical local provisions can be used and tied to performance objectives.

- DoP has advised that the E4 zone is to be applied to the Sydney metropolitan area only. This zone is to account for existing developments within environmentally sensitive locations such as riparian corridors.
- This zone may have some application in areas adjacent to Western Sydney Parklands where remnant vegetation or riparian connectivity exists.
- Trading or offsets permitted at a local scale (ie within Fairfield City only)

RE1 Public Recreation
Template objectives:

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- Protect, manage and restore areas of high and moderate conservation

Application in Fairfield.

This zone is generally intended for land to be used for public open space and recreation. This land may have some special environmental or scenic values but is principally to be used for active or passive recreation. In many locations this land adjoins sites zoned E2 which is land identified as having greater environmental value. Development for recreation purposes including playground equipment, seating, shared paths and facilities or structures to support recreation would be permitted in RE1.

RE2 Private Recreation

- To enable land to be used for private open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- Protect, manage and restore areas of high and moderate conservation

Application in Fairfield.

This zone is generally intended for land to be used for private recreation. This land may have some environmental or scenic values but is principally to be used for private recreation. Development for recreation purposes including playground equipment, paths and facilities or structures to support private recreation would be permitted in RE2.

W1 Natural Waterways

- To protect the ecological and scenic values of natural waterways.
- To prevent development that would have an adverse effect on the natural values of waterways in this zone.
- To provide for sustainable fishing industries and recreational fishing.

Application in Fairfield

This zone is applied to waterways with critical ecological values. Based on discussions with State Agencies, the E2_Environmental Conservation Zone is more applicable to context and classification of creeks and streams in the City and their relationship with surrounding urban development. Specific issues relating to fish habitat and other ecological values will be addressed via an Environmental Overlay (see 8.2 below).

W2 Recreational Waterways

- To protect the ecological, scenic and recreation values of recreational waterways.
- To allow for water-based recreation and related uses.
- To provide for sustainable fishing industries and recreational fishing.

Application in Fairfield.

This zone is generally intended for Chipping Norton Lakes and areas that are intended for recreational use. Developments that do not have a clear requirement to be associated with the waterway would not be permitted. Development that have no alternative for being sited elsewhere (eg roads or other public facilities) would be permitted with consent. Waterfront structures such as jetties, sea walls, pontoons, boat ramps, marina structures and moorings would be permitted within the W2 zone with consent where the impact upon the environment is minimised.

8.2 Environmental Overlays (LEP Local Clause)

There are two types environmental overlays to be considered for use under the Standard instrument. The first relates only to excluding exempt and complying development and is defined under clause 18 of the Standard Template as Environmentally Sensitive Lands.

The second is an approach taken by other local councils to develop a local provision to map areas of 'Environmental Protection' that require additional assessment or heads of consideration prior to approval. This overlay approach aims to:

- Simplify the planning framework for Council and the Community
- Clearly identify the spatial location/distribution and nature of significant environmental values in the City

- Coordinate and implement the multiple natural resource management directions and objectives required of the state and regional agencies at a local scale
- Allows for development permissible within the zoning, but adds specific assessments and provisions to ensure the important environmental attributes within these identified areas are considered during development assessment
- Developing a spatial layer within Council databases that recognises areas of environmental protection that contain high biodiversity, riparian or habitat values within the City

The desired outcome of an Environmental Protection Overlay's is to:

- Identify, define and protect at a local level:
    - the extent and condition of endangered ecological communities
    - areas of know threatened species habitat
    - significant vegetation communities
    - locations of regionally significant flora and fauna
    - riparian lands and the buffers that protect water quality within to the receiving water outside the City
    - the scenic, landscape and community values associated with natural areas
- To control and manage adverse environmental impacts of development on environmental values within the City
- Mitigate the impacts on aquatic systems within and downstream of Fairfield City
- Sustain the natural process and ecosystem connectivity within the City to enhance habitat for biota

It should be noted that there is a clear conservation preference for land to be zoned according to its environmental value(s) rather than choose overlays. Should an overlay be preferred, the local provision would need to apply to all land mapped as high conservation and all adjoining medium conservation in Fairfield City.

There are also a number of approaches to the development of local provisions to implement such mapping. For example, a separate provision can be developed for each separate value (ie specific objectives and controls for biodiversity riparian lands, habitat corridors, aquatic habitat etc). Alternatively a single provision with a more generic approach can be developed. Examples of these approaches are outlined in **Appendix E**.

8.3 Development Assessment

In addition to the strategic planning processes, where relevant, biodiversity considerations need to be addressed in the planning, assessment and approvals process for site based developments and activities.

In preparing the LEP and establishing links with key policies and development control plans the following updating of the Fairfield City Wide DCP and Council Policies are recommended:

- Support conservation outcomes in landscaping requirements.
- Amend the current Tree Protection Order to include remnant native vegetation mapped as in TX (or Low) condition
- Prepare a offsetting policy procedure
- Integrate updated Bushfire Prone Lands Mapping
- Develop and implement impact assessment guidelines for Councils development and activity approvals so that when assessing the significance of impacts under the TSC Act and cumulative impact (under the EP&A Act)
- Review as appropriate S94 and S94A plans to reflect biodiversity objectives in light of changes to State legislation
- Build capacity within Fairfield City Council by developing training and support packages for staff and contractors for the application of new guidelines and mapping
- Prepare a set of model conditions for development consents to address protection, maintenance and enhancement of biodiversity values.
- Update Development Application Guide to reflect the above policies.

9. Targets for Fairfield City

Managing ecological values and planning for biodiversity conservation is difficult in a complex landscape. Key requirements are:

- a knowledge of what the ecological values are,
- an understanding of their relative value, and
- develop specific targets, desired outcomes or performance objectives for these values.

The mapping prepared for the Fairfield City Council provides a comprehensive and valuable resource to assist decision makers in identifying what ecological values are where in the City. It relies on a consistent, repeatable, and acceptable methodology. It is not an exhaustive list of all the biodiversity values and makes use of the fauna habitat information published by DECC. The mapping uses vegetation communities as a surrogate for the broader spectrum of biodiversity values, an approach endorsed by DECC and CSIRO.

This conservation assessment aims to provide an analysis of the relative priority of various communities and patches of vegetation across the City. The habitat

classification used by in the Rapid Fauna Assessment is relied upon to classify critical habitat in the City. This forms the basis of various strategy recommendations.

To measure and monitor performance, specific targets are needed. Targets can provide a clear strategic direction, a quantifiable goal that enables decision makers to assess the context and relative significance of potential outcomes arising from their day to day decisions.

This section provides an outline of targets developed for the Fairfield City Biodiversity Strategy, their policy framework and relevant justification.

9.1 Established Targets for Fairfield CITY

Within the Environmental Management Plan for the City of Fairfield that is designed to deliver the City Plan over the timeframe 2006 to 2016, there are also targets that relate directly to or provide assistance in achieving biodiversity conservation. These include:

- 30% of both sides of creeks banks rehabilitated to natural condition
- 50% of riparian zones revegetated
- Over 75% of all creek water quality samples each year meet ANZECC guidelines for secondary contact
- 75% of the creek system is free of noxious and exotic weeds
- 50% of private land adjoining creeks is free of noxious weeds and exotic plants
- Increase canopy cover of original bushland to 15% (not including WSP)
- Increase canopy cover of native bushland in public ownership by 5%
- Establishment of a program to monitor 'sightings' of native animal species over at least two set periods per year
- 30% of the City with tree canopy
- Plant 30,000 indigenous trees, shrubs and ground covers per year

10. Implementation Plan

A complementary Biodiversity Implementation Plan has been developed to action the above strategies. The Biodiversity Implementation Plan is designed to be executed as funds become available and ideally over a five year period by Council. Many of the recommendation consolidate existing practises within Council's operations. The Biodiversity Implementation Plan (BIP) has been designed to be adaptable to changing Council resources and issues and as such has been separated from this Biodiversity Strategy.

10.1 Operational Objectives

In order to achieve the targets set by Fairfield City Council the following operational objectives are recommended:

Land and Water Management

LW1 Actively facilitate the acquisition, management and conservation of high conservation values to protect and restore native vegetation communities, threatened species habitat and riparian land.

LW2 Actively manage fire thresholds to within recommended tolerances.

LW3 Protect, maintain and restore natural flow regimes, aquatic connectivity and the lifecycle and movement of aquatic organisms along a watercourse.

LW4 Continue, expand and adjust weed and pest management and control.

LW5 Evaluate, develop and implement operational practices that protect and enhance biodiversity values on Council lands.

LW6 Continue to support and develop incentives schemes to assist and encourage land managers to implement ecologically sustainable practices for the conservation of biodiversity.

Education

ED1 Undertake activities aimed at raising awareness of the community about the importance and conservation of biodiversity.

ED2 Develop training and education resources and programs to improve Councils understanding of biodiversity management issues and actions.

Resources

R1 Adequately and appropriate increase resource allocation and funds to the implementation of this strategy.

R2 To preparation and implement a Data Management Strategy that facilitates the exchange and use of biodiversity information for all aspects of this strategy.

R3 Continue to seek grants and funding from various sources.

Monitoring

M1 Develop core indicators of biodiversity in Fairfield and incorporate these into an ongoing monitoring strategy.

M2 To review this Biodiversity Strategy to ensure that it remains relevant to Councils business.

Recommended actions and prioritisation to implement these objectives are outlined in the BIP.

11. Summary

The development of the conservation significance assessment for Fairfield City is based on the best available local and regional data at the time of compilation. There is however a range of additional data, particularly aquatic, that have been highlighted that could improve the accuracy and application of this data set.

The data set provides a robust planning layer to inform Council of the high, moderate and low conservation value remnant vegetation. The CSA highlights riparian vegetation in all areas and woodlands in the semi-rural area of particular importance within the City and at a regional, state and national level.

It is important to note that all remnant vegetation in Fairfield City is significant and that this strategy does not extinguish the requirements of state and commonwealth environmental law with regard to threatened species and communities that occur in the area.

Classification of areas of Habitat Conservation Significance have been included to highlight the existence of these areas and to move towards conservation and restoration.

The role of strategic planning, offsetting strategies, guidelines for assessment and approvals and indicators are of particular importance in the short term.

Land and water management and education will require a long term commitment; however also need to be responsive to changes provided by monitoring. As such these actions are contained in the Biodiversity Implementation Strategy to be implemented by Council over a five year period.

12. References

DECC 2008 Rapid fauna Habitat Assessment of the Sydney Metropolitan Catchment Authority Area.

DECC Terrestrial Vertebrate Fauna of the Greater Southern Sydney Region

Ecological Australia (2007) *Fairfield Vegetation Mapping Update Report,* Unpublished report prepared for Fairfield City Council.

Fairfield City Council (2007) *Creek Care Program Review*

Farifield City Council (1994) *Development Control Plan*

Fairfield City Council (2006) *Environmental Management Plan 2006-2016*

Farifield City Council (1994) *Local Environmental Plan*

Fairfield City Council (2006) *State of Environment Report 2005-2006*

Manidis Roberts Consultants (2004) *Prospect Creek Open Space Corridor, Plan of management*. Report prepared for Holroyd City Council, Fairfield City Council and DIPNR

National Parks and Wildlife Service (NPWS) (2002b), *Guidelines for the conservation significance assessment of the native vegetation of the Cumberland Plain, Western Sydney,* NSW National Parks and Wildlife Service, Hurstville.

New South Wales National Parks and Wildlife Service (NPWS) (2002a) *Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney*, *Final Edition* NSW NPWS, Hurstville.

NSW Rural Fire Service (2006). Guideline for Bush Fire Prone Mapping- Version 3. NSW Rural Fire Service, Homebush.

13. Glossary

Action includes both 'development' (under Part 4) and 'activities' (under Park 5) of the EP&A Act.
Baseline information is information relating to a specific time or defined place, from which trends or changes can be assessed or to which they can be related.
BioBanking Biodiversity Banking and Offsets Scheme under the *Threatened Species Conservation Amendment (Biodiversity Banking) Act 2006*. Allows 'biodiversity credits' to be generated by landowners. Developers can buy these credits and use them to counterbalance (offset) the impacts on biodiversity values that are likely to occur as a result of development. The scheme is currently under development with implementation expected in mid 2007.
Biodiversity (biological diversity) is the variety of life: the different plants, animals and microorganisms, the genes they contain and the ecosystem of which they form a part. The concept is often considered at genetic, species and ecosystem levels. It is a reflection and essential part of the operation of ecological processes. Whilst some ecosystems are naturally more diverse than others, the amount of diversity does not necessarily directly relate to conservation value or management. Conservation of biodiversity is a fundamental principle of ecologically sustainable development.
Bioregion (or biogeographic region) is a region in which the boundaries are primarily determined by (or reflect) similarities in geology, climate and vegetation.
Bush regeneration means the rehabilitation of bushland from a weed-infested or otherwise degraded plant community to a healthy community composed of native species. Natural regeneration relies on natural germination and resprouting of plants, and focuses on weed removal, management of disturbance and the maintenance of natural processes. It does not normally include replanting of vegetation. Assisted regeneration uses natural regeneration, but also includes intervention actions such as site replanting with locally indigenous seed or plant material derived from the locality (or other similar plant communities to that occurring on the site), or controlled management of disturbance.
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. Bushland may include regrowth. At any one time some species may only be present as seeds in the soil.
Catchment is the entire area of land drained by a river and its tributaries.
Communities An integrated group of species inhabiting a given area; the organisms within a community influence one another's distribution, abundance, and evolution.
Clearing native vegetation has the same meaning as in the *Native Vegetation Act 2003* and means any one or more of the following: (a) cutting down, felling, thinning, logging or removing native vegetation,

(b) killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation. (See Division 3 of Part 3 of the Native Vegetation Act 2003 for the exclusion of routine agricultural management activities (RAMAs) from constituting the clearing of native vegetation if the landholder can establish that any clearing was carried out for the purpose of those activities.)
Connectivity is a measure of the degree of interconnection of habitat for a particular species.
Conservation is one of the approaches to ecosystem management. It aims to maintain the continuity of a system, with or without change and refers to the process and actions of looking after a place so as to retain its natural significance. Conservation includes protection, maintenance and monitoring.
Corridors are linear landscape features that connect two or more, larger habitat patches, allowing either movement of individuals, or gene-flow among native fauna and flora.
Covenant is a restriction on the use of land recorded on the property title and binding on successive owners. Covenants may be 'negative' (imposing restrictions) or 'positive' (imposing positive obligations).
Critical habitat refers to habitat that is critical to the survival of endangered species, populations or ecological communities. Part 3 of the *Threatened Species Conservation Act 1995* and Part 7A of the *Fisheries Management Act 1994* provides for areas of critical habitat to be formally declared.
Cumulative impacts refers to impacts resulting from a multitude of developments or activities, and their interactions in space and time.
Data are raw numbers or other uninterpreted descriptive material.
Database is a collection of data or information. The term is often used to refer to data or information held in a computer.
Design means responding to a set of criteria, constraints and opportunities and achieving a desired outcome. It is a futures-oriented process for making meaningful order.
Development is defined by the Environmental Planning and Assessment Act 1979. It means the use of land, the subdivision of land, the erection of a building, the carrying out of a work, the demolition of a building or work, or any other act, matter or thing controlled by an environmental planning instrument.
Ecological community (or community) is an assemblage of species occupying a particular area. 'Endangered ecological community' is defined under the NSW *Threatened Species Conservation Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*.
Ecological processes are processes that play an essential role in maintaining the integrity and continuity of an ecosystem. Important ecological processes are water

and nutrient cycling, the flow of energy, and evolution by natural selection.
Ecologically sustainable development (ESD) refers to development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased. It is defined in NSW legislation in terms of the application of principles adopted by the Intergovernmental Agreement on the Environment. These principles relate to precautionary decision-making, intergenerational equity, conservation of biodiversity and valuation of resources.
Ecosystem is a dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.
Endangered Ecological Communities An ecological community (made up of a group of living organisms) listed in Schedule 1 of the NSW TSC Act 1995.
Endemic species Those species that are native to a certain region with restricted distributions and within in restricted range. Outside that restricted range (such as an ecosystem island, or within country boundaries) an endemic species is found nowhere else on earth
Environment The combination of external conditions (both natural and non natural) that influence the life of individual organisms.
Environmental weed is a plant that spreads and invades native vegetation.
Environmentally significant areas Lands that have been marked on a layer of the draft Fairfield City Council LEP as High Conservation Value.
Escarpment refers to a steep slope or long cliff that results from erosion or faulting and separates two relatively level areas of differing elevations.
Fauna means animals (including both vertebrates and invertebrates).
Fire regime refers to the history of fire at a particular place, referring to frequency, intensity and season of burning.
Fragmentation is the process of progressive loss and isolation of habitat.
Goal is a statement of value to be pursued. It is usually stated in a general (and unmeasurable) form. Goals are sometimes referred to as aims.
Habitat corridor is an area of habitat that enables migration, colonisation and interbreeding of plants and animals between two or more larger areas of habitat. Habitat corridors may be continuous, and may also consist in whole or part of a sequence of discontinuous areas of habitat (such as feeding trees, caves, wetlands and roadside vegetation).
Habitat means the structural environments where an organism lives for all or part of its life, including environments once occupied (continuously, periodically or occasionally) by an organism or group of organisms, and into which organisms of

that kind have the potential to be reinstated.
Habitat loss is the removal of vegetation (as opposed to logging, etc).
Habitat value refers to the extent to which an area is capable of supporting large numbers of a range of species. Habitat value is related to the extent of vegetation diversity (both species and structure), and the availability of resources such as nesting places, food and protection from predators, as required by each species present.
High Conservation Value (HCV) Land that has high biodiversity significance (also known as **environmentally significant areas** meeting any of the specified HCV criteria listed for Fairfield City in Table 9 of this report.
Infiltration the process of water entering a hard surface through openings or pores.
Introduced species is a species that is not locally indigenous.
Issue is a point in question or dispute. It is an expression of public importance, concern or contention. Identification of issues is used as a way of focusing and prioritising attention.
Land use refers to the spatial expression of the aggregation of purposes for which land is occupied or employed, and the activities associated with those purposes.
Local refers to the geographical scale comprising a single local government area.
Locality, in relation to biodiversity survey work, generally refers to an area within a 10 km radius of a site. (See also **Local**).
Locally indigenous species is a species that occurs naturally within a local area and which has genetic material deriving from that local area.
Low Conservation Value Land that has low biodiversity significance (i.e. not an **environmentally sensitive area**) meeting the LCV criteria listed for Fairfield City in Table 9 of this report
Management plan is a plan that specifies a program of action for managing a particular area of land. Management plans may be: • generic documents that apply to a particular class of sites within a region, catchment or local government area • site-specific documents that apply to an individual property or reserve • statutory documents (such as a 'plan of management' for community land under Part 2 of Chapter 6 of the Local Government Act 1993) • legally binding on private landowners, such as a management plan referred to in a property agreement • advisory documents, such as a farm property plan.
Monitoring is a systematic process involving planned and repeated data collection, analysis, interpretation, reporting and acting on the data.
Medium Conservation Value Land that has medium biodiversity significance (i.e. not an **environmentally sensitive area**) meeting any of the specified MCV criteria listed for Fairfield City in Table 9 of this report.

Native species is normally used to refer to species indigenous to NSW, but is also sometimes used to imply a locally indigenous species.
Native vegetation has the same meaning as in the Native Vegetation Act 2003 and means: (1) Native vegetation means any of the following types of indigenous vegetation: (a) trees (including any sapling or shrub, or any scrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland. (2) Vegetation is indigenous if it is of a species of vegetation, or if it comprises species of vegetation, that existed in the State before European settlement. (3) Native vegetation does not include any mangroves, sea grasses or any other type of marine vegetation to which section 205 of the Fisheries Management Act 1994 applies.
Natural area is a classification assigned to certain community land for the purposes of the Local Government Act 1993. Land should be categorised as a natural area if the land, whether or not in an undisturbed state, possesses a significant geological feature, geomorphological feature, landform, representative system or other natural feature or attribute that would be sufficient to further categorise the land as bushland, wetland, escarpment, watercourse or foreshore.
Noxious weeds are defined in terms of the Noxious Weeds Act 1993.
Objectives are similar to goals, but are expressed in measurable terms.
Offsetting An offset is an action taken away from the development site that seeks to compensate for the loss of vegetation caused by that development site. It may take the form of monetary compensation, revegetation/regeneration etc
Plan of management (community land) (PoM) is a management plan for community land prepared under Part 2 of Chapter 6 of the Local Government Act 1993.
Point sources the originating point of pollution, usually referred to in terms of water quality.
Policy is a statement of values that are to be satisfied when choosing amongst alternatives. It guides ongoing decision-making.
Population is a group of organisms, all of the same species, occupying a particular area.
Preservation is one of the approaches to ecosystem management. It aims to minimise change in a system.

Pre-1750 referring to the distribution of vegetation communities prior to European settlement.
Principle is a rule of conduct or action that is applied when implementing a policy.
Program is an action specification for implementing a policy. A program should include a timetable, specific actions and allocations of resources. It elaborates and implements policy.
Project is a set of tasks or activities undertaken in pursuit of a particular problem or issue.
Region is a concept used to group geographic areas having some common feature or relationship, generally for the purposes of administration or study. Regions may coincide with natural boundaries such as water catchments, bioregions or landscape units, or with socio economic or other boundaries. Some legislation allows regions to be determined for the purposes of administration.
Rehabilitation is a general concept referring to the restoration and repair of a degraded ecosystem system to a former condition. Rehabilitation may take several forms that, depending upon the degree of naturalness, range between regeneration, restoration, reconstruction, reclamation and stabilisation. Rehabilitation may require implementation of a range of techniques, such as revegetation and weed control.
Reinstatement means to introduce to a place one or more species or elements of habitat or geodiversity that are known to have existed there naturally at a previous time, but that can no longer be found at that place
Restoration Capacity is a measure of the difficulty of undertaking ecological restoration at a site. It is based on an assessment of resilience and robustness. This will determine the type of restoration or rehabilitation that it is feasible to undertake.
Restoration is the process of (or end result of) reinstatement of the structure and dynamics of a preexisting community. It is a form of rehabilitation.
Revegetation see **Reinstatement** and **Restoration**
Riparian land means any land which adjoins, directly influences, or is influenced by a body of water. This includes land immediately adjacent to small creeks and rivers, river banks, intermittent streams or gullies, and areas surrounding lakes and wetlands on river floodplains which interact with the river during floods. The width of riparian land is largely determined by management objectives, and may need to be defined in terms of distances from water bodies or by mapping.
Sedimentation the process of subsidence and deposition by gravity of suspended matter carried in water; usually the result of the reduction of water velocity below the point at which it can transport the material in suspended form
Species impact statement (SIS) is a study that predicts the harmful effects of a proposed development or activity on threatened species, populations or communities or their habitats, and recommends measures to protect against those

effects. It is prepared under Division 2 of Part 6 of the *Threatened Species Conservation Act 1995* or Division 6 of Part 7A of the *Fisheries Management Act 1994*. A species impact statement must be prepared in relation to certain development proposals and activities under the *Environmental Planning and Assessment Act 1979*.
Species is a group of organisms capable of interbreeding freely with each other but (usually) not with members of other species. It includes any recognised sub-species or other taxon below a sub-species, and any recognisable variant of a sub-species or taxon.
Strategies are the mechanisms for carrying of goals and objectives into effect. They are action statements explaining how something is to be achieved. Strategies lead to policies and programs.
Target is a more detailed example of an objective. It is expressed as the value of some indicator or other variable that should be achieved by a given date or other predefined circumstance. Targets are often confirmed by a political or community process.
Threatened species is a species considered to be at risk of becoming extinct, or of becoming endangered. Such species are listed in the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.
Threatening process is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities.
Understorey any plants growing under the canopy formed by other plants, particularly herbaceous and shrub vegetation under a tree canopy.
Wetland means land periodically or permanently inundated with water, comprising emergent aquatic vegetation dominated by characteristic wetland species. Wetlands include areas commonly described as swamps, mangroves, ponds, lagoons, and the like. The majority of plant species present normally comprise sedges and rushes. Two general types of wetlands are normally recognised, namely freshwater wetlands and saltwater (or estuarine) wetlands.

Appendix A: Relevant Legislation

Commonwealth

Environment Protection and Biodiversity Conservation Act, 1999.

The *Commonwealth Environmental Protection and Biodiversity Conservation Act, 1999* (EPBC Act) provides a national scheme for environmental protection and biodiversity conservation. The purpose of the Commonwealth *EPBC Act* is to ensure that actions likely to cause a significant impact on a matter of national environmental significance undergo an assessment and approval process. Under the *EPBC Act*, an action includes a project, undertaking, development or activity.

An action that "*has, will have or is likely to have a significant impact on a matter of national environmental significance*" may not be undertaken without prior approval from the Commonwealth Minister for the Environment and Heritage.

The Act lists matters of national environmental significance (NES). NES matters relevant to Fairfield City include:

- Migratory Species (14 species see **Appendix B**)
- Species and Communities listed on the EPBC Act (21 species and 1 community identified in the body of the report)
- Historic Heritage (4 properties not subject to this biodiversity strategy)
- Ramsar Site (Towra Point Nature Reserve is within the same catchment)
- Threats listed in the EPBC Act

The Administrative Guidelines for the *EPBC Act* set out criteria intended to assist in determining whether an action requires approval. In particular, the Guidelines contain criteria for determining whether a proposed action is likely to have a "significant impact" on a matter of national environmental significance.

National Strategy for the Conservation of Australia's Biological Diversity

The National Strategy for the Conservation of Australia's Biological Diversity (1996) provides a definition for biodiversity and sets out goals and principles to underpin the management and conservation of biodiversity at a national scale. The document addresses the need for integration of biodiversity conservation with natural resource management, and the need to manage threatening processes, improve knowledge and involve the community. It also provides a set of priorities for implementation and review.

National Objectives and Targets for Biodiversity Conservation

In June 2001 Environment Australia published a comprehensive set of *National Objectives and Targets for Biodiversity Conservation 2001* that was signed off by State and Territory Governments. The targets can be applied to any land

management region and are built on the principle of protecting a sample of the variety of ecosystems present, to ensure their long-term survival.

The targets provided for native vegetation and terrestrial ecosystems state that by 2003 Australia will have:

> *"clearing controls in place that prevent clearance of ecological communities with an extant below 30% of that present pre-1750;"*

and

> *"native vegetation restoration programs to recover ecological communities that are below 10% of that present pre-1750 or are nationally listed as critically endangered".*

This provides a clear and measurable target within a recognised policy position. The effectiveness of these targets is dependent on the approach used to control clearing and restore ecological communities.

Intergovernmental Agreement on the Environment (IGAE)

On 31 October 1990, Heads of Government of the Commonwealth, States and Territories of Australia, and representatives of Local Government in Australia, meeting at a Special Premiers' Conference held in Brisbane, agreed to develop and conclude an Intergovernmental Agreement on the Environment to provide a mechanism by which to facilitate:

- a cooperative national approach to the environment;
- a better definition of the roles of the respective governments;
- a reduction in the number of disputes between the Commonwealth and the States and Territories on environment issues;
- greater certainty of Government and business decision making; and
- better environment protection

International agreements and conventions

Australia is a signatory to the following international conventions:

- Japan–Australia Migratory Bird Agreement (JAMBA) and China–Australia Migratory Bird Agreement (CAMBA)
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- International Convention on Biological Diversity
- International Convention for the Protection of the World Cultural and Natural Heritage (1972)

These conventions have been ratified and incorporated within the EPBC Act.

National Local Government Biodiversity Strategy (1998)

The *National Local Government Biodiversity Strategy* presents an agreed local government position on the management of biodiversity. The strategy presents five key objectives.

- To develop a national awareness, training and education program, with a view to supporting local biodiversity programs
- To ensure resourcing for a greater role for councils in biodiversity management
- To encourage regional partnerships and planning along existing regional boundaries and acknowledge and work with catchment organisations
- To encourage State Government to review and amend local government role in managing biodiversity
- To provide a co-ordinated national information and monitoring system to provide councils with basic information on biodiversity in their area

The strategy provides an action plan which details specific actions required, responsibilities and estimated costs

JANIS Criteria and CAR Principles

The Commonwealth Government, in their National Forest Policy Statement (NFPS – signed in 1992) provide an undertaking to manage Australia's forests to conserve biological diversity. In order to achieve this it was agreed that a comprehensive, adequate and representative (CAR) reserve system be created (JANIS, 1997 – a Commonwealth-State committee addressing the implementation of the NFPS).

The JANIS criteria for a CAR reserve system included numerical targets. Relevant numerical targets include:

- 15% of pre-1750 distribution of forest ecosystems,
- at least 60% of vulnerable ecosystems, and
- 100% of rare and endangered forest ecosystems.

Vulnerable ecosystems are defined as "approaching a reduction in aerial extent of 70% within a bioregional context and which remains subject to threatening processes; or not depleted but subject to continuing and significant threatening processes which may reduce its extent.

A **rare** ecosystem is one where its geographic distribution involves:

- a total range generally less that 10,000 hectares
- a total area of generally less than 1000 hectares, or
- patch sizes of generally less than 100 hectares (where such patches do not aggregate to form significant areas)

An **endangered** ecosystem is described as one where:

- its distribution has contracted to less than 10% of the pre1750 distribution (former range)
- the total area has contracted to less than 10% of its former area, or
- 90% of its area is in small patches which are subject to threatening processes and unlikely to persist

Other criteria raised in the JANIS process that could be considered relevant to this strategy include:

- Reserved areas should be replicated across the geographic range.
- Maximise the area of high quality habitat for all known elements of biodiversity.
- Reserves should be large enough to sustain the viability, quality and integrity of populations.
- Sample the full range of biological variation within each forest ecosystem.
- In fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system.

The NFPS recognises the need to promote the management of forests on private land to meet the conservation goals. It is important to stress that its focus is on forests and not other communities such as heath, grassland, wetlands etc.

The targets and criteria developed under JANIS can be applied to Fairfield City Council. They have a sound scientific basis that was developed over some time. They provide more specific targets for reservation that slide depending on the extent of clearing and risk. The application of reservation would need to be looked at to ensure that it focuses on viable patches and that there are processes to support the implementation. Although reservation comes mostly under the governance of DECC within Fairfield City, Council has a role in setting up and managing non-statutory reserves.

State

Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation in NSW. Part 3 of the EP&A Act sets the framework for preparation of environmental planning instruments such as Local Environmental Plans (LEPs).

Parts 3A, 4 and 5 of the EP&A Act indicate the decision making processes for assessment of proposed development and activities. When deciding if a proposal should be approved, the consent/determining authority (e.g. Council) must consider a range of environmental matters including maintenance of biodiversity and the likely impact on threatened species, populations or

ecological communities. The Act is linked to the *Threatened Species Conservation Act 1995*.

Local councils have a range of development assessment and approval functions under the *Environmental Planning and Assessment Act 1979*, which includes in its objectives the proper management of natural resources, and the promotion of orderly and economic development of land.

In 2006 the government ordered that all LEPs be revised in keeping with a Standard Instrument. This report outlines suggested approaches for biodiversity protection under the new standard instrument and for consideration in the comprehensive LEP review.

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) and amendments in 2002, 2004 and 2006, identify threatened species, communities and populations, and provisions for managing and protecting them such as recovery plans, priority action statements and threat abatement plans.

The TSC Act indicates the assessment process for proposed development that is likely to have a significant effect on threatened species, populations, or ecological communities, or their habitats. Council is the primary agency for determining whether a significant effect is likely to occur, irrespective of whether a recovery plan exists or not. Council has a responsibility to ensure that it makes decisions relating to threatened species, communities and populations, on the best available information.

The *Threatened Species Legislation Amendment Act 2004* (TSLA Act) focuses on the protection and restoration of native vegetation and threatened species habitat at the landscape scale. This can be achieved by bio-certification of environmental planning instruments, including LEPs.

To certify the LEP the NSW Ministers for the Environment and Primary Industries need to be satisfied that the LEP is compatible with a regional conservation plan and will lead to the overall improvement or maintenance of biodiversity values in the study area.

A 2006 amendment to the Act provides for BioBanking, which is a process and method for generating BioBanking credits through conservation works that can then be traded to offset, on a like-for-like basis, impacts occurring due to development in a particular location where impacts could not be avoided.

Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) aims to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations. The Act protects both marine vegetation, fish habitat (freshwater

and marine) and threatened species, including species and habitat found in inland rivers. The Act also provides for the identification of critical habitat and threatening processes.

Assessments may need to consider the Department of Primary Industries (Fisheries) policies that fish passage not be obstructed. This Act also provides for the Minister of Primary Industries to grant biodiversity certification to Environmental Planning Instruments (EPIs) under the FM Act in a similar fashion to that outlined under the TSC Act.

Local Government Act 1993

Council has a particular charter as set out in the *Local Government Act (CITY) 1993* to address biodiversity conservation. Section 8(1) of the Act details this charter:

> "*to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development*".

Plans of management are required to be prepared for public lands in the CITY under the LG Act. Typically these plans include environmental management provisions such as in the Fairfield City Management Plan and Environmental Management Plan. There are also provisions (s36B and C) which relate Council's obligations in responding to recovery planning, threatened species habitat and areas of natural value.

National Parks and Wildlife Act 1974

This Act creates the roles and responsibilities of DECC and also protects a number of native flora and fauna not listed under the *Threatened Species Conservation Act*. The Act also establishes the statutory roles for the protection and management of Aboriginal Cultural Heritage items.

Catchment Management Act 2003

The *Catchment Management Authority Act 2003* (CMA Act) established CMAs. The Fairfield City is within the Hawkesbury Nepean and Sydney Metropolitan CMAs. Council will need to work with these CMAs to identify actions to manage biodiversity. Funds may be available to Council from the CMAs to implement actions for biodiversity management.

State Environmental Planning Policy (SEPP) 19 –Bushland in Urban Areas

The general aim of this policy is to protect and preserve bushland within urban areas of a size and configuration which will enable the existing plant and animal communities to survive in the long term. Particularly the policy aims to protect

rare and endangered flora and fauna species, habitats for native flora and fauna, and wildlife corridors.

The policy also recognises the role native vegetation plays in protecting soil surfaces, scenic values, geological features, natural drainage lines, watercourses, and archaeological relics. Access for the community is also catered for through acknowledging the role of bushland for recreational, educational and public enjoyment.

Sydney Environmental Planning Policy No 31—(Western Sydney Regional Parklands) 2009

This SEPP replaces the zoning and planning controls of the Fairfield LEP. The Parklands SEPP provides a consistent planning and management framework with a focus on the needs of residents in Western Sydney for:

- high quality open space
- a range of recreational opportunities
- a visual and physical break between areas of urban development

The area also provides areas to maintain, enhance and rehabilitate natural systems care for cultural assets, and in some areas protect the quality of the water in Prospect Reservoir, its Upper Canal and other bulk water supply infrastructure.

Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment

The general aims and objectives of this plan are to maintain and improve the water quality and river flows of the Georges River and its tributaries. This includes the eastern flowing creeks of Fairfield CITY.

The Plan provides a mechanism for Council to be required to consider adverse, cumulative and potential downstream impacts on groundwater, water quality and river flows within the Georges River or its tributaries when determining development and activity applications and in preparing local environmental plans.

The specific aims and objectives of this plan in relation to biodiversity are as follows:

a) to preserve and protect and to encourage the restoration or rehabilitation of regionally significant sensitive natural environments such as wetlands (including mangroves, salt marsh and seagrass areas), bushland and open space corridors within the Catchment, by identifying environmentally sensitive areas and providing for appropriate land use planning and development controls,
b) to preserve, enhance and protect the freshwater and estuarine ecosystems within the Catchment by providing appropriate development,

c) to ensure that development achieves the environmental objectives for the Catchment.
d) to identify land uses in the Catchment which have the potential to impact adversely on the water quality and river flows in the Georges River and its tributaries and to provide appropriate planning controls aimed at reducing adverse impacts on the water quality and river flows,
e) to conserve, manage and improve the aquatic environment within the Catchment which is a significant resource base for the aquaculture industry, by providing controls aimed at reducing pollution entering the Catchment's watercourses,
f) to protect the safety and well being of the local and regional community in accordance with standards and processes aimed at improving the water quality and river flows in the Catchment to enable recreation,
g) to aid in the improvement of the environmental quality of Botany Bay in conjunction with other regional planning instruments.

Part 3, Section 21 specifically deals with development within a 100m of streams and creeks within the catchment and prescribes specific planning controls such as minimum buffer widths, weed removal and the increase of terrestrial and aquatic biological diversity and provision of fauna habitat and corridors.

Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997)

The aim of this plan is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context. This plan applies to the western semi rural area of the Fairfield CITY. Similarly to the Georges River Plan the SREP for Hawkesbury Nepean outlines general and specific planning considerations for consent authorities in the preparation of LEP's and DCP's.

Section 6(6) specifically outlines planning considerations for flora and fauna which include:

a) Conserve and, where appropriate, enhance flora and fauna communities, particularly threatened species, populations and ecological communities, aquatic habitats, wetland flora, rare flora and fauna, riverine flora, flora with heritage value, habitats for indigenous and migratory species of fauna, and existing or potential fauna corridors.
b) Locate structures where possible in areas which are already cleared or disturbed instead of clearing or disturbing further land.
c) Minimise adverse environmental impacts, protect existing habitat and, where appropriate, restore habitat values by the use of management practices.
d) Consider the impact on ecological processes, such as waste assimilation and nutrient cycling.

e) Consider the range of flora and fauna inhabiting the site of the development concerned and the surrounding land, including threatened species and migratory species, and the impact of the proposal on the survival of threatened species, populations and ecological communities, both in the short and longer terms.
f) Consider the need to provide and manage buffers, adequate fire radiation zones and building setbacks from significant flora and fauna habitat areas.
g) Consider the need to control access to flora and fauna habitat areas.
h) Consider the need to maintain corridors for fish passage, and protect spawning grounds and gravel beds.

There are further specific considerations for water quality and quantity, environmentally sensitive lands, wetlands, riverine ecosystems, and residential and urban development. The Plan reinforces the consent requirements under the *Rivers and Foreshores Improvement Act* for any development within 40m of the top of bank.

Biodiversity certification

Biocertification can be granted to an Environmental Planning Instrument (EPI) by the relevant Minister under the *Threatened Species Conservation Act 1995* or the *Fisheries Management Act 2003*. Certification remains in force for a period determined by the Minister. If no period is specified then it will remain in force for te years unless suspended or revoked.

The primary effect of granting certification is that it removes the need to undertake threatened species assessments or prepare species impact statements at the development application stage. Hence, if certification is granted to land this will mean that developments within those areas do not need to further assess the impacts on threatened species.

Before determining whether to grant biodiversity certification, the Minister for the Environment must be satisfied that the environmental planning instrument, and any associated planning package, will lead to an **overall improvement or maintenance** of biodiversity values. The Minister must also consider a range of other factors listed in the TSC Act prior to granting certification.

In certified areas BioBanking may be used to meet the 'improve or maintain' requirement for biodiversity certification. That is, council may require that all developments within specific land-use zones of a certified area participate in BioBanking. This will ensure that impacts to biodiversity are offset by positive management actions at another site. This scheme is currently being developed and trialed by DECC.

State Biodiversity Strategy

The NSW Biodiversity Strategy recognises the collaborative responsibility of the community, local and state government and the importance of local planning in

biodiversity conservation. It provides guidance for Councils to prepare and implement biodiversity plans. The strategy has several key goals which include:

- Identifying and tackling threats to biodiversity
- Improving knowledge of the state's biodiversity
- Involving landowners and communities in biodiversity conservation
- Managing natural resources better, for ecologically sustainable development
- Protecting native species and ecosystems

NSW State- Wide Targets for Natural Resource Management

The State Government has adopted seven macro environmental state-wide targets and six specific priority targets for natural resource management. These targets will guide investment and provide a means of recording change over time. Both CMAs and Councils will have some role in contributing to these targets being reached. The targets are set out in Table A2 below:

Table A2. State-wide Natural Resource Management (NRM) Targets

Biodiversity	
Macro-environmental	1. By 2015 there is an increase in native vegetation extent and an improvement in native vegetation condition 2. By 2015 there is an increase in the number of sustainable populations of a range of native fauna species
Specific priorities	3. By 2015 there is an increase in the recovery of threatened species, populations and ecological communities 4. By 2015 there is a reduction in the impact of invasive species
Water	
Macro-environmental	5. By 2015 there is an improvement in the condition of riverine ecosystems 6. By 2015 there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses 7. By 2015 there is no decline in the condition of marine waters and ecosystems
Specific priorities	8. By 2015 there is an improvement in the condition of important wetlands, and the extent of those wetlands is maintained 9. By 2015 there is an improvement in the condition of estuaries and coastal lake ecosystems
Land	
Macro-environmental	10. By 2015 there is an improvement in soil condition
Specific priorities	11. By 2015 there is an increase in the area of land that is managed within its capability
Community	
Macro-environmental	12. Natural resource decisions contribute to improving or maintaining economic sustainability and social well-being
Specific priorities	13. There is an increase in the capaCity of natural resource managers to contribute to regionally relevant natural resource management

(Natural Resources Commission (2006) Fact Sheet State-wide targets for natural resource management Natural Resources Commission, Sydney NSW)

Catchment Action Plans

Fairfield CITY is divided by the Hawkesbury Nepean Catchment Management Authority (CMA) area in the west of the CITY, and Sydney CMA Catchment Action Plan (CAP) in the east or urban part of the CITY. The Catchment Action Plans (CAPs) of the CMA feed directly into the statewide targets outlined above.

The Sydney Metropolitan CAP has the following relevant biodiversity management targets in their Draft CAP:

- By 2007, complete vegetation mapping of extent native vegetation in the Sydney Metropolitan Catchment.
- By 2008, prioritise areas of native vegetation in the Sydney Metropolitan Catchment for conservation and restoration based on conservation value and level of risk and undertake on ground works at priority sites.
- By 2008, develop and implement an agreed Sydney Metropolitan Biodiversity Conservation Package consistent with the Metropolitan Strategy and Subregional Strategies. The Package will include policy, education and management guidelines for Local Government, NSW Government State Agencies and communities to conserve and restore native vegetation.
- By 2008, develop and implement a reporting framework to consistently record all the activity that is undertaken to improve the condition of native vegetation in the Sydney Metropolitan Catchment area.
- By 2008, all the major identified vegetation habitat corridors are recognised in the Sub-regional Strategies.
- By 2016, there is an increase in the extent, condition and connectivity of regional biodiversity corridors. (Regional biodiversity corridors to be identified by 2009).
- By 2016, support the implementation of Priority Action Statements by: implementing all priority 1 actions where the SMCMA is identified as the lead agency by 2009 and implementing all actions where the SMCMA is identified as the lead agency.
- By 2016, activities classified as 'key threatening processes' are identified and included in all management plans and agreements with the SMCMA.
- By 2011, facilitate and part fund the implementation and bi-annual review of the actions identified in the Sydney Metropolitan Weeds Strategy (final draft to be developed by the end of 2006).
- By 2011, develop and implement action plans for five priority pest animal species (aquatic and terrestrial), with the intention of reducing their number, distribution and impact on biodiversity.
- By 2008, support education and research into the distribution and spread of three priority invasive pathogens.
- By 2016, populations or patches of invasive species identified as key threatening processes are included in Threat Abatement Plans, and managed according to the priorities in those Plans.

For the Hawkesbury Nepean CMA areas in the west of the CITY the following are relevant management targets:

- Establishing 2300 ha of native vegetation through revegetation
- Conserving 2300 ha of native vegetation through landholder action
- Improving condition of native vegetation using active and passive regeneration of buffers around high priority, existing remnants
- Identifying and including in management plans activities classified as 'threatening processes'
- Conserving threatened species, endangered populations and communities outside currently protected areas
- Reducing weeds through primary weed control and eradicating new weed outbreaks and emerging weed threats
- Sustaining progress of areas treated for invasive plant control
- Including populations of invasive pest animal species in TAPs, and managing them according to the priorities in those plans
- Reducing conditions that favour invasive species
- Identifying key species and populations through subcatchment action plans

There are also broader catchment targets enforcing these management targets and other catchment targets that relate to estuaries, riparian areas, community capacity, water quality and land capability.

Other relevant state legislation

- Rivers and Foreshores Improvement Act 1948
- Rural Fires Act 1997
- Water Management Act 2000
- Conveyancing Act 1919
- Noxious Weeds Act 1993
- Community Land Management Act 1989
- Nature Conservation Trust Act, 2001
- National Parks and Wildlife Act, 1974
- Protection of the Environment Operations Act 1997
- Natural Resource Commission Act 2004

Local Planning Instruments

New LEP guidelines

The Department of Planning has issued model provisions for the redrafting of all LEPs in NSW. These model provisions set out in an order under the Environmental Planning and Assessment Act, *Standard Instrument (Local Environmental Plans)*

Order 2006, a consistent set of zone names and objectives and other matters that can be addressed in the relevant sections of the new LEP.

Fairfield Local Environmental Plan (LEP) 1994

The current Fairfield Local Environmental Plan contains no environmental zoning, however there are provisions relating to biodiversity in the following sections:

- Tree Protection (s10)
- Development of flood-liable land (s11)
- Development in the vicinity of creeks and waterways (s12) including a 20m exclusion zone from the top of bank
- Landfill and clearing (s13) including requiring council consent for all clearing of land
- Council consent required for the construction of dams in rural areas (s23)
- Natural heritage items listed in Schedule 4 such as the Red Gums on Cabramatta Golf Course are protected through s30-33 of the LEP.

It is understood that Council will be reviewing the LEP in light of the Standard instrument gazetted by DoP.

Fairfield City Wide DCP 2006

Development Control Plans (DCPs) contain specific requirements for development. The purpose of the Fairfield City Wide Development Control Plan (The City Wide DCP) is to illustrate the controls that apply to particular types of development. This City Wide DCP supplements Fairfield Local Environmental Plan 1994 and is made according to the *Environmental Planning and Assessment Act 1979*.

The current Fairfield City Wide DCP 2006 has provisions for environmental site assessments for development, tree protection orders and landscape planning provisions. It is understood that Council is in the process of preparing a more detailed Landscape DCP. Further it is envisaged that the Fairfield City Wide DCP 2006 will be updated following the comprehensive LEP review.

The Fairfield City Council Environmental Management Plan 2006-2016

The Environmental Management Plan 2006-2016 identifies the importance of protection and enhancement of Fairfield's areas of bushland, waterways, scenic corridors and networks of open space. The principles and objectives of this Plan provide an important link between the role of this Biodiversity Strategy and Council's other environmental and sustainability objectives.

Tree Preservation Orders

Fairfield City Council's Tree Preservation Order prohibits the ring barking, cutting down, topping, lopping, removing, injuring or wilful destruction of any tree/s over 4 metres tall, within the City of Fairfield. Trees 4 metres or greater in height are

protected by a Tree Preservation Order and can only be removed or substantially pruned after a site inspection by the Tree Preservation Officer, and written Council approval.

Draft Cumberland Plain EEC Recovery Plan – In Preparation.

The DEC is preparing a draft recovery plan for Endangered Ecological Communities of the Cumberland Plain. The plan aims to halt the loss of biodiversity and achieve a net gain in the extent and condition of vegetation on the Cumberland Plain, so as to commence 'recovery' of the ecological communities. This will then lead to the creation of a viable bushland network across the landscape, with each remnant complimenting the next. The plan will guide the actions needed over the first five years of recovery.

The recovery plan aims to address issues associated with achieving a balance between conservation of these important ecological communities, and other community needs such as housing, roads, railways and other urban development (NPWS 2006a).

Fairfield City Council has been listed as one of the public authorities responsible for the implementation of the recovery plan. The NSW TSC Act 1995 therefore requires that council must take appropriate measures to implement actions in the recovery plan. Furthermore, council is required to report on the measures taken to implement those actions. Finally, under the NSW TSC Act 1995 the council must not make any decisions that are inconsistent with the provisions of the recovery plan.

Green Web.

The Green Web is a native vegetation management plan which provides a blueprint for the protection and enhancement of ecological communities, achievable through its proposed network of corridors across Sydney.

Plans of Management.

These are required under the Local Government Act 1993 for the management of public lands. They require site-specific plans for lands that are the subject of a recovery plan. A recovery plan is being prepared for the Endangered Ecological Communities (EEC's) on the Cumberland Plain and includes the Fairfield CITY. Therefore this would mean specific plans for these areas.

Stormwater Management Plans.

These are required to be prepared under Section 12 of the Protection of the Environment Operations Act 1997, within a timely period.

Appendix B: Listed Migratory Terrestrial Species

Table A1: EPBC Listed Migratory Terrestrial Species

Common Name	Scientific Name	Description
Birds		
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Species or species habitat likely to occur within area
White-throated Needletail	*Hirundapus caudacutus*	Species or species habitat may occur within area
Rainbow Bee-eater	*Merops ornatus* *	Species or species habitat may occur within area
Black-faced Monarch	*Monarcha melanopsis*	Breeding may occur within area
Satin Flycatcher	*Myiagra cyanoleuca*	Breeding likely to occur within area
Rufous Fantail	*Rhipidura rufifrons*	Breeding may occur within area
Regent Honeyeater	*Xanthomyza phrygia*	Species or species habitat likely to occur within area
Migratory Wetland Species		
Birds		
Great Egret, White Egret	*Ardea alba*	Species or species habitat may occur within area
Cattle Egret	*Ardea ibis*	Species or species habitat may occur within area
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii* *	Species or species habitat may occur within area
Painted Snipe	*Rostratula benghalensis s. lat.*	Species or species habitat may occur within area
Migratory Marine Birds		
Fork-tailed Swift	*Apus pacificus*	Species or species habitat may occur within area
Great Egret, White Egret	*Ardea alba*	Species or species habitat may occur within area
Cattle Egret	*Ardea ibis*	Species or species habitat may occur within area

APPENDIX C: Declared Noxious Weeds in Fairfield City.

Current at time of printing. Please check the following website.

Source: http://www.dpi.nsw.gov.au/agriculture/noxweed

Common Name	Species Name	Control Category
African feathergrass	Pennisetum macrourum	5
African turnipweed	Sisymbrium runcinatum	5
African turnipweed	Sisymbrium thellungii	5
Alligator weed	Alternanthera philoxeroides	3
Anchored water hyacinth	Eichhornia azurea	1
Annual ragweed	Ambrosia artemisiifolia	5
Arrowhead	Sagittaria montevidensis	5
Artichoke thistle	Cynara cardunculus	5
Athel tree	Tamarix aphylla	5
Bitou bush	Chrysanthemoides monilifera subspecies rotunda	3
Black knapweed	Centaurea nigra	1
Blackberry	Rubus fruticosus aggregate species	4
Boneseed	Chrysanthemoides monilifera subspecies monilifera	3
Bridal creeper	Asparagus asparagoides	5
Broomrapes	Orobanche species Includes all Orobanche species except the native O. cernua variety australiana and O. minor	1
Burr ragweed	Ambrosia confertiflora	5
Cabomba	Cabomba caroliniana	5
Castor oil plant	Ricinus communis	4
Cayenne snakeweed	Stachytarpheta cayennensis	5
Chilean needle grass	Nassella neesiana	4
Chinese violet	Asystasia gangetica subspecies micrantha	1
Clockweed	Gaura lindheimeri	5
Clockweed	Gaura parviflora	5
Corn sowthistle	Sonchus arvensis	5
Dodder	Cuscuta species Includes All Cuscuta species except the native species C. australis, C. tasmanica and C. victoriana	5
East Indian hygrophila	Hygrophila polysperma	1
Espartillo	Achnatherum brachychaetum	5
Eurasian water milfoil	Myriophyllum spicatum	1
Fine-bristled burr grass	Cenchrus brownii	5
Fountain grass	Pennisetum setaceum	5
Gallon's curse	Cenchrus biflorus	5
Glaucous starthistle	Carthamus glaucus	5
Golden thistle	Scolymus hispanicus	5
Green cestrum	Cestrum parqui	3
Harrisia cactus	Harrisia species	4
Hawkweed	Hieracium species	1
Horsetail	Equisetum species	1
Hygrophila	Hygrophila costata	2
Hymenachne	Hymenachne amplexicaulis	1
Karoo thorn	Acacia karroo	1
Kochia	Bassia scoparia	1
Lagarosiphon	Lagarosiphon major	1
Lantana	Lantana species	4

Common Name	Species Name	Control Category
Lantana	Lantana species	5
Long-leaf willow primrose	Ludwigia longifolia	4
Long-leaf willow primrose	Ludwigia longifolia	5
Ludwigia	Ludwigia peruviana	3
Mexican feather grass	Nassella tenuissima	1
Mexican poppy	Argemone mexicana	5
Miconia	Miconia species	1
Mimosa	Mimosa pigra	1
Mossman River grass	Cenchrus echinatus	5
Onion grass	Romulea species Includes all Romulea species and varieties except R. rosea var. australis	5
Oxalis	Oxalis species and varieties Includes all Oxalis species and varieties except the native species O. chnoodes, O. exilis, O. perennans, O. radicosa, O. rubens, and O. thompsoniae	5
Pampas grass	Cortaderia species	4
Parthenium weed	Parthenium hysterophorus	1
Pellitory	Parietaria judaica	4
Pond apple	Annona glabra	1
Prickly acacia	Acacia nilotica	1
Prickly pear	Cylindropuntia species	4
Prickly pear	Opuntia species except O. ficus-indica	4
Privet (Broad leaf)	Ligustrum lucidum	4
Privet (Narrow-leaf/Chinese)	Ligustrum sinense	4
Red rice	Oryza rufipogon	5
Rhus tree	Toxicodendron succedanea	4
Rubbervine	Cryptostegia grandiflora	1
Sagittaria	Sagittaria platyphylla	5
Salvinia	Salvinia molesta	2
Sand oat	Avena strigosa	5
Senegal tea plant	Gymnocoronis spilanthoides	1
Serrated tussock	Nassella trichotoma	4
Siam weed	Chromolaena odorata	1
Smooth-stemmed turnip	Brassica barrelieri subspecies oxyrrhina	5
Soldier thistle	Picnomon acarna	5
Spotted knapweed	Centaurea maculosa	1
St. John's wort	Hypericum perforatum	4
Texas blueweed	Helianthus ciliaris	5
Water caltrop	Trapa species	1
Water hyacinth	Eichhornia crassipes	2
Water lettuce	Pistia stratiotes	1
Water soldier	Stratiotes aloides	1
Willows	Salix species Includes all Salix species except S. babylonica, S. x reichardtii, S. x calodendron	5
Witchweed	Striga species Includes all Striga species except native species and Striga parviflora	1
Yellow burrhead	Limnocharis flava	1
Yellow nutgrass	Cyperus esculentus	5

Appendix D: Results of prediction of threatened fauna habitat

The table lists the species used in assessment of predicted threatened species habitat and the number of vegetation polygons in which they were predicted to occur. The threatened fauna (listed under TSC Act Schedule 2 List) is recorded in Fairfield Area (approx 10km radius) as per findings of an Atlas of NSW Wildlife Search conducted 5th June 2007.

Common Name	Scientific Name	# vegetation polygons in which predicted
Australasian Bittern	*Botaurus poiciloptilus*	99
Bush Stone-curlew	*Burhinus grallarius*	721
Gang-gang Cockatoo	*Callocephalon fimbriatum*	138
Eastern Pygmy-possum	*Cercartetus nanus*	316
Brown Treecreeper	*Climacteris picumnus*	0
Spotted-tailed Quoll	*Dasyurus maculatus*	0
Eastern Quoll	*Dasyurus viverrinus*	643
Black-necked Stork	*Ephippiorhynchus asiaticus*	0
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	10
Painted Honeyeater	*Grantiella picta*	289
Broad-headed Snake	*Hoplocephalus bungaroides*	986
Comb-crested Jacana	*Irediparra gallinacea*	142
Black Bittern	*Ixobrychus flavicollis*	986
Swift Parrot	*Lathamus discolor*	983
Green and Golden Bell Frog	*Litoria aurea*	986
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	0
Cumberland Plain Land Snail	*Meridolum corneovirens*	27
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	810
Eastern Freetail-bat	*Mormopterus norfolkensis*	935
Large-footed Myotis	*Myotis adversus*	258
Turquoise Parrot	*Neophema pulchella*	986
Barking Owl	*Ninox connivens*	230
Powerful Owl	*Ninox strenua*	714
Yellow-bellied Glider	*Petaurus australis*	986
Squirrel Glider	*Petaurus norfolcensis*	230
Brush-tailed Rock-wallaby	*Petrogale penicillata*	750
Koala	*Phascolarctos cinereus*	585
Grey-headed Flying-fox	*Pteropus poliocephalus*	17
Speckled Warbler	*Pyrrholaemus sagittatus*	11
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	19
Greater Broad-nosed Bat	*Scoteanax rueppellii*	445
Diamond Firetail	*Stagonopleura guttata*	230
Masked Owl	*Tyto novaehollandiae*	0
Regent Honeyeater	*Xanthomyza phrygia*	986

Appendix E: Example Local Clause

Environmental Sensitive Land — Biodiversity

1) The objective of this subclause is to protect maintain and improve the diversity of landscapes including;
   a) protecting biological diversity, native fauna and flora, and
   b) protecting ecological processes necessary for their continued existence, and
   c) encouraging the recovery of threatened species, communities, populations and their habitats.
2) This clause applies to development on land identified as Environmentally Sensitive Land on the Environmentally Sensitive Land – Biodiversity Map.
3) For the purpose of this clause the Environmentally Sensitive Land - Biodiversity Map means the Fairfield Local Environmental Plan [year] Environmentally Sensitive Land - Biodiversity Map.
4) Consent must not be granted to development unless an environmental assessment has been undertaken to the satisfaction of the consent authority to identify any potential adverse impact on;
   a) any significant vegetation community, or
   b) the habitat of any threatened species, populations or ecological communities, or
   c) any regionally significant species of plant or animal, or
   d) any riparian corridor, or
   e) water quality, or
   f) biodiversity values within a reserve.
5) Where an environmental assessment has determined that the development will cause a potential adverse impact the consent authority must be satisfied;
   a) the development meets the objectives of the clause, and
   b) that the development is designed, sited and managed to avoid the potential adverse environmental impact, or
   c) where a potential adverse impact cannot be avoided the development;
      I. is designed and sited so as to have minimum adverse impact, and

II. incorporates effective measures to remedy or mitigate any adverse impact, and
III. where possible offset any significant adverse impact through the restoration of any existing disturbed areas on the site.

Riparian Corridors
Native vegetation along streams has value for protection of in-stream habitat, prevention of soil erosion and often provides highly valuable habitat areas.

Objectives

- To protect and manage existing good condition native vegetation remnants in Riparian Corridors, and
- To restore degraded native vegetation in riparian corridors, and
- To regenerate native vegetation in cleared areas along Riparian Corridors, and
- To protect and restore buffer areas to native vegetation in the Riparian Corridors, and
- To identify, protect and manage the aquatic ecological values including bed and bank stability, water quality and natural flow regimes,
- To protect the linkages provided by Riparian Corridors, and
- To have a neutral or beneficial effect on water quality.

Performance Measures
Category 1
A person must not take an action in or adjacent to lands mapped as Category 1 (40m from Top of Bank) where that action:

- Is within 10m of the 40m buffer, or
- leads to an adverse affect on the condition of native vegetation within the Riparian Corridors, or
- reduces the extent of native vegetation within the Riparian Corridor, or
- fragments an occurrence of native vegetation within the Riparian Corridor, or
- modifies or destroys abiotic factors (such as water, nutrients, or soil) necessary for the survival of native vegetation within the Riparian Corridor, or
- results in invasive species that are harmful to Riparian Corridors becoming established in an occurrence of these lands, or
- diminishes the capacity of a buffer area adjacent to a Riparian Corridor, or
- adversely affects the capacity of a regional connectivity area or riparian corridor, or

- reduces bed and bank stability, or
- adversely affects water quality.

Category 2
A person must not take an action in or adjacent to lands mapped as Category 2 (20m from Top of Bank) where that action:

- Is within 10m of the 20 metre buffer zone, or
- leads to a long-term adverse affect on good or moderate condition native vegetation within the Riparian Corridors (moderate/good vegetation defined as less than 50% weed cover and at least a canopy cover of 25% of the lower threshold for the vegetation type), or
- reduces the overall extent of vegetation within the Riparian Corridors, or
- fragments an occurrence of vegetation within the Riparian Corridors, or
- modifies or destroys abiotic factors (such as water, nutrients, or soil) necessary for the survival of vegetation within the Riparian Corridors, or
- results in invasive species that are harmful to Riparian Corridors becoming established in an occurrence of these lands, or
- adversely affects the capacity of the riparian corridor, or
- reduces bed and bank stability, or
- adversely affects water quality.

Category 3
A person must not take an action in or adjacent to lands mapped as Category 3 (10m from Top of Bank) where that action:

- leads to a long-term adverse affect on good condition native vegetation within the Riparian Corridors, or
- fragments an occurrence of vegetation within the corridor, or
- destroys abiotic factors (such as water, nutrients, or soil) or
- results in invasive species that are harmful to Riparian Corridors becoming established in an occurrence of these lands, or
- adversely affects the capacity of the riparian corridor, or
- reduces bed and bank stability, or
- adversely affects water quality, or
- where the requirements of the *TSC Act, FM Act, WM Act or RFI Acts and* Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment and Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River, have not been met

Urban Habitat corridors

These corridors have been identified in the urban zone of the City and focused on open space and public lands. As such this overlay does not impact on private land use or zoning. However, on private lands this overlay can be linked to incentive programs and other planning initiatives such as Green Web.

Objectives

- To protect and manage existing native vegetation remnants in local and regional corridors,
- To protect and increase the linkages provided by local corridors,
- To restore degraded native vegetation, and
- To regenerate native vegetation in cleared areas within and adjacent to local corridors.

Performance Measures

A person must not undertake an action in or adjacent to lands mapped as a corridor where that action:

- leads to a long-term adverse affect on native vegetation within the corridor area, or
- reduces the extent of vegetation within the corridor, or
- adversely affects the capacity of connectivity within the corridor or to a riparian corridor
- where the requirements of the *TSC Act* have not been met

A person must not undertake an action in or adjacent to vegetation within regional corridors where the requirements of the TSC Act have not been met.

Rural Habitat Corridors

Due to the existence of more endangered ecological communities and the rural nature of the western part of the City (west of the Western Sydney Parklands), the number and size of corridors in the landscape is greater.

Objectives

- To protect and manage existing native vegetation remnants in local and regional corridors,
- To restore degraded native vegetation, and
- To regenerate native vegetation in cleared areas within and adjacent to local corridors.

Performance Measures

A person must not undertake an action in or adjacent to lands mapped as a corridor where that action:

- leads to a long-term adverse affect on native vegetation within the corridor area, or

- reduces the extent of vegetation within the corridor, or
- adversely affects the capacity of connectivity within the corridor or to a riparian corridor
- where the requirements of the *TSC Act* have not been met

Alternative Generic Approach

This local provision is an attempt to combine a number of NRM and biodiversity objectives and has received tacit and verbal endorsement from DoP as an acceptable approach in Sydney Metro.

Local Clause XX: Environment Protection Overlay (Example)

(1) The objectives of this clause are as follows:
- (a) to protect, enhance and manage the ecological, hydrological, scientific, cultural and aesthetic values of biodiversity and wildlife habitat corridors, natural water bodies and riparian land,
- (b) to enhance connections between remnants of indigenous vegetation,
- (c) to prevent the fragmentation and degradation of remnant vegetation,
- (d) to ensure that clearing and other development is located and designed to avoid or minimise the impact on the ecological, hydrological, scientific, cultural and aesthetic values of biodiversity and wildlife habitat corridors, natural water bodies and riparian land.

(2) This clause applies to all land shown as "environmentally sensitive land" on the Environmentally Sensitive Land Map.

(3) Before deciding an application to carry out development, the consent authority must consider whether the development meets the objectives of this clause and such of the following as are relevant:
- (a) the condition and significance of the vegetation on the land and whether it should be substantially retained in that location,
- (b) the importance of the vegetation in that particular location to native fauna,
- (c) the strategic importance of the land as part of a biodiversity corridor,
- (d) the sensitivity of the land and the effect of clearing vegetation,
- (e) the relative stability of the bed and banks of any waterbody that may be affected by the development, whether on the site, upstream or downstream,
- (f) the effect of the development on watercourse health, including pollution of the watercourse or waterbody, a significant increase or decrease in the amount or velocity of runoff entering the watercourse or waterbody, or a significant increase in siltation of the watercourse or waterbody,

(g) the effect of the development on the functions of aquatic ecosystems (such as habitat and connectivity).

(5) Development consent must not be granted to development mentioned in subclause (3) unless the consent authority is satisfied that:
(a) the development is designed and will be located and managed to avoid any potential adverse environmental impact, or
(b) if a potential adverse environmental impact cannot be avoided, the development:
(i) is designed and located so as to have minimum adverse impact, and
(ii) incorporates effective measures to remedy or mitigate any adverse impact caused.

Appendix F: Threatened Species know to occur in Fairfield City.

Source : Rapid Fauna Habitat Assessment of the Sydney Metropolitan Catchment Management Authority DECC 2008

Threatened Species Known to Occur:

Species	Threat Category*	Last Recorded	Tenure	Comments
Green and Golden Bell Frog	Endangered	2003 (Atlas record)	Crown: DECC, SCA	Current status uncertain. Several records from Bull-rush *Typha* bordering the dam in Apr 2003 (Atlas of NSW Wildlife records). Not listed as a current locality in the draft recovery plan for the species (DEC 2005b).
**Bush Stone-curlew	Endangered	1972 (Vella 2004b)	Crown: DECC, SCA	One historical record in 1972 (Vella 2004b).
Swift Parrot	Endangered	2007 (Vella 2007)	Crown: DECC, SCA	Regular visitor in small numbers between autumn and early spring when eucalypt species are in blossom, such as Grey Box *Eucalyptus moluccana* and Forest Red Gum *E. tereticornis*. For example, one individual seen in Aug 2007 (Vella 2007), two in Aug 2005 (Vella 2005), one in May 2004 (Vella 2004a) and 10 in early Sept 2000 (Vella 2000).
**Speckled Warbler	Vulnerable	Undated (Vella 2004b)	Crown: DECC, SCA	Formerly present in the area (A. Coleman, cited in Vella 2004b).
**Squirrel Glider	Vulnerable	1989 (Atlas	Crown:	Status uncertain since no recent

Species	Threat Category*	Last Recorded	Tenure	Comments
		record)	DECC, SCA	spotlighting surveys have been undertaken. The only record is from the Water Supply Reserve on the south side of the site. If still present it is likely to occur in woodland in the Prospect NR.
Grey-headed Flying-fox	Vulnerable	2004 (Atlas record)	Crown: DECC, SCA	Forages in the site when suitable trees and shrubs are in flower or fruit (Atlas of NSW Wildlife records). No known camps in the area (P. Eby, flying-fox consultant, pers. comm.).
Eastern Bentwing-bat	Vulnerable	2002 (Atlas record)	Widespread foraging habitat; roost: Crown: SCA	Recorded roosting in Prospect Reservoir tunnel (Atlas of NSW Wildlife records). Likely to forage in a wide range of habitats across the site.
Southern Myotis	Vulnerable	1999 (Atlas record)	Crown: DECC, SCA	One record on the northern edge of the Reservoir in Oct 1999 (Atlas of NSW Wildlife record). Likely to occur widely around the Reservoir and may potentially roost in Prospect Reservoir tunnel.
Eastern False Pipistrelle (UNCONFIRMED)	Vulnerable	1999 (Atlas record)	Crown: DECC, SCA	One unconfirmed record identified from ultrasonic calls recorded from on the northern side of the Reservoir in Oct 1999 (Atlas of NSW Wildlife record). The ultrasonic signals of this species are readily confused with those of the Greater Broad-nosed Bat and the Gould's Wattled Bat (Pennay *et al.* 2004; H. Parnaby, DECC, pers. comm.; R. Williams, Ecotone, pers. comm.). Therefore, due to the absence of trapped individuals, all ultrasonic calls in the coastal region of the Sydney Basin Bioregion are regarded as unconfirmed (DECC 2007b).

* As listed under TSC Act 1995; ** Only recorded prior to 1997.

Appendix G. Guidelines for Fish Habitat Protection and Threatened Aquatic Species for LEP's

Source Department of Primary Industries 18th February 2008

General

Aquatic habitats (eg creeks, rivers, streams, lakes, lagoons, billabongs, estuaries, bays, inlets etc) are assets to the local community. Not only do they contribute to the cultural and environmental well being of regions, they also contribute to the regional economy through industry (eg fishing, aquaculture) and fishing tourism. Their conservation helps ensure the region's economy is sustained into the future.

Aquatic habitats are often subject to development pressure for water access, recreational use, residential, agricultural and industrial development. However, very few are recognised and incorporated into LEPs to ensure that consistent environmental assessment and development controls apply in these areas.

LEPs play a major role in managing new and expanded developments. Developments can affect aquatic habitats:

- **Directly** and/or
- **Indirectly** and
- During the **construction** phase and/or
- During the **operational** phase.

Indirect impacts upon aquatic habitats caused by water quality decline (eg from soil exposure and stormwater discharge from upstream developments) are of equal or greater threat as direct impacts due to the footprint of the development impinging upon aquatic habitats.

Zoning restrictions can largely eliminate **direct** impacts, but other mechanisms (such as conditions placed upon development consents to prepare, implement and audit Water Quality Management Plans) will be required to deal with **indirect** impacts.

The Department recommends the inclusion of provisions that contribute to the conservation of aquatic ecosystems by addressing **both** these pathways (direct/indirect) and phases (construction/operation).

The planning approach outlined below is based on the concept of zoning expansive waterbodies (bays, lakes, estuaries etc) as well as identifying all significant waterbodies including rivers and creeks as "sensitive waterways" with an overlay or hatching over the top of the underlying zone including those that may already be zoned "Waterway".

Waterway zones will determine the types of developments that are permitted/not permitted within waterways whereas the purpose of the sensitive waterway overlay is not to specify which developments are permitted/not permitted, but to highlight the fact that there is some additional sensitivity associated with the environment in that area and higher performance standards in relation to water quality and aquatic habitats are required for developments which are permitted.

Protection and Management of Key Fish Habitats

1. DPI is currently preparing maps of "key fish habitats" to assist Councils with the preparation of their LEPs. The aim of the maps is to highlight those habitats that are of most importance for protection and conservation to sustain fish populations. To arrange access to Key Fish Habitat maps for the Fairfield LGA please contact Carla Ganassin on 9527 8552.

2. Broad expanses of "key fish habitats" (such as lakes) should be included in either zone W1 Natural Waterways or zone W2 Recreational Waterways. DPI is available to work with Council to help determine the most appropriate zoning category.

    a. The edge of the zone should extend to Highest Astronomical Tide Mark for tidal areas and to the top-of-bank for non-tidal creeks, streams, rivers, lagoons, billabongs etc.

    b. Different zones could apply to different parts of a large waterway. For example, zone W3 Working Waterways should only be applied to those parts of the waterway where existing shipping and maritime related services are already established or to enable a small increase in extent or consolidation to satisfy predicted demand. The remainder of the waterway should be zoned W1 or W2.

    c. Waterway zones will determine the types of developments that are permitted/not permitted over waterways. Developments that do not have some clear requirement to be associated with the waterway should be included in the "Prohibited" category. Future developments that have no alternatives for being sited elsewhere (eg roads and other public utilities inevitably have to cross streams sooner or later) or are consistent with the zoning (eg environmental restoration works) can be included in the "development with consent" category.

    d. Waterfront structures such as jetties, seawalls, pontoons, boat ramps and moorings should be designated "Prohibited development" within zone W1 but designated "Development with Consent" in zones W2 and W3.

    e. "Removal or relocation of large woody debris (desnagging)" should be designated "Development with Consent" in zones W1 and W2 in recognition of the fact that it is listed as a key threatening process.

3. Linear "key fish habitats" such as rivers and creeks should not be zoned "Waterway" as such (although large river channels such as the Georges River could be) but should be identified on a "Sensitive Waterway" overlay map.

    a. The Sensitive Waterway overlay should also be applied to waterbodies that have been zoned "Waterway". The purpose of the Sensitive Waterway Overlay is not to specify which developments are permitted/not permitted, but to highlight the fact that there is some additional sensitivity associated with the area and higher performance standards in relation to water quality and aquatic habitats are required for developments which are permitted without consent or permitted with consent.

    b. A generic clause relating to the Sensitive Waterway map has been developed and is available from DPI and/or DoP. It requires that development applications for proposals within the mapped waterway or within 40m of the mapped waterway be accompanied by an assessment of the likely impacts upon important aquatic and riparian constraints and values including bank stability, instream and riparian habitat, fish passage, public access and water quality. If impacts are likely to be significant the development can only be approved if the proposal is consistent with the objectives of the clause, it has been designed to minimise impacts and offsets are put in place.

4. To help avoid inadvertent breaches of legislation, and facilitate the Integrated Development provisions of the *EP&A Act*, the LEP should also include two "Advisory Notes" (ie non legal clauses) to remind Council staff, developers and their advisors, that works within streams and waterbodies may require a permit or concurrence from the NSW DPI **even though the works may or may not require development consent from Council** and/or require more detailed environmental assessment. DPI

recommends that such notes be included on the map that shows the Sensitive Waterway overlay as well as after the relevant clause of the written document.

Suggested wording for such notes is:

***Advisory Note**: (1) Excavation of material from the bed or banks of a waterbody, (2) depositing any sand, soil, rock, rubble or other material on the bed of a waterbody, (3) constructing a structure (weir, dam, causeway etc) within a waterbody such that the flow of water or the free passage of fish may be obstructed, or (4) extracting water from the waterway may require a permit in accordance with the provisions of the Water Management Act, Rivers and Foreshores Improvement Act or the Fisheries Management Act. Please check with the Department of Water and Energy **and** the Department of Primary Industries.*

***Advisory Note**: "Degradation of native riparian vegetation along NSW waterways", "Removal of large woody debris (snags)" and "Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams" are listed as Key Threatening Processes under the provisions of the Fisheries Management Act. Careful consideration of the appropriateness of a development proposal that will contribute to a loss or decline in native riparian vegetation, involve the removal of snags or involve the installation or change in operation of an instream structure is required. If the area is habitat for a threatened species, population or community of fish, then a "significant impact" is likely to be the conclusion of the 7 part test and a Species Impact Statement will be required.*

Environmentally Sensitive Areas

1. Due to the sensitive nature and connectivity of aquatic habitats it is recommended that all key fish habitats and adjacent riparian buffers or setbacks (ie all that land identified as "Sensitive Waterway") regardless of whether it has been developed and regardless of its zoning should be identified as "environmentally sensitive areas" (as per Clause 18 of LEP template). This will ensure that no exempt or complying development is allowed to occur in these areas and that there is adequate environmental assessment of potential impacts of development on these habitats.

Fish Passage

1. Fish need to move within waterways and overland to wetlands and floodplains during flood events in order to breed, recruit to new areas and to access habitat for different life cycle stages. LEPs should ensure that **lateral** and **longitudinal** connectivity within and between aquatic habitats is maintained to sustain aquatic biodiversity and ecosystem function.
2. **Lateral** connectivity refers to maintaining the links between in-stream habitats and adjacent floodplain and wetland habitats during flooding events. Barriers such as flood levees, roads across floodplains and block banks can restrict the ability of fish to move between these habitat areas. Floodplains and wetlands are also important spawning habitats for several native fish species during flood conditions.
3. **Longitudinal** connectivity refers to the movement of fish upstream and downstream and between freshwater and saltwater areas. Barriers such as poorly designed road crossings, weirs, dams, floodgates and other man-made structures can limit the ability for fish to move within and between habitats to access food, shelter to breed and to avoid/escape poor habitat conditions. Connectivity is also important to maintain natural flow conditions and to improve water quality.
4. Inclusion of a Sensitive Waterways overlay map and the relevant clause as outlined in dot point 3 above will help prevent inappropriate fragmentation of fish migration pathways. Roads are the most significant factor in fragmentation of fish migration pathways and given their potential for more general adverse environmental impacts

(especially vegetation clearing and soil erosion) should not be included in the "Development without consent" category in the land use table for any zone.

6. Waterway structures including weirs, dams, causeways, road crossings, floodgates etc should not be included in the "Exempt Development" or "Complying Development" Schedules or "Development without Consent" Categories for any waterway zoning or any zoning that includes significant waterways. All such structures should require development consent.

Protection of Aquatic Vegetation

1. Riparian and in-stream aquatic vegetation are important components of healthy fish habitats. They play a key role in regulating water quality (e.g. water temperature, nutrient absorption, trapping silt from entering waterways etc.) and provide sources of food and shelter for a range of aquatic fauna, including native fish.
2. DPI recommends that Clause 32 of the LEP Template - Preservation of Trees or Vegetation be included and the Development Control Plan (DCP) which prescribes the "species or kinds of trees or other vegetation" that the Clause applies to, should specifically include emergent and submerged aquatic vegetation in freshwater, estuarine & marine waterways and riparian vegetation (other than recognised weeds).

Land Subdivision and Basic Landholder Rights

1. Subdivision of land fronting freshwater waterways creates additional Basic Landholder Rights under the provisions of the *Water Management Act*. This contributes to greater water extraction from streams. The LEP should avoid establishing zones where subdivision is permissible over land that includes major waterways, in particular those delineated as "key fish habitats". If that is not possible, the subdivision layout should avoid creating a multitude of lots with stream frontage.