The City of Newcastle

Strategy

Newcastle Biodiversity Strategy

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NEWCASTLE BIODIVERSITY STRATEGY

Biodiversity - Global Common Goods

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The City of Newcastle

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Foreword

Biological diversity or “biodiversity” is the natural infrastructure that supports life on earth, and life in Newcastle.

Biodiversity has created our natural landscapes and helps make Newcastle a special place. The City’s beaches, bushland, harbour and wetlands are internationally recognised, and are home to many natural surprises. This natural heritage contributes to our quality of life and provides many social and economic benefits to our community.

The Newcastle Biodiversity Strategy provides a clear policy statement about the value and our approach to the City’s biodiversity. It will inform Council’s approach to its core activities through the Newcastle Environment Management Plan (2003) and guide advocacy, planning, works and education.

The *Newcastle Biodiversity Strategy* addresses policy, conservation and management priorities that have been determined by the community, regulation, international treaties, planning and science. The Strategy builds on the current efforts of Council, governments, community organisations and groups, industry and the many individuals who already positively contribute to the City’s natural assets and biodiversity.

The Strategy is part of Council’s commitment to working toward an ecological sustainable future for the City and region.

Many individual actions contribute to the continuing loss of biodiversity in Newcastle and the Hunter Region. This Strategy aims to reverse this trend. It is achievable with the help and co-operation of the whole community.

We all want to keep Newcastle’s biodiversity and continue to enjoy the many benefits that it provides. Let’s make it happen!

Councillor John S. Tate
Lord Mayor of Newcastle

Contents

Summary

The *Newcastle Biodiversity Strategy* provides first steps toward making biodiversity issues an important and integrated part of decision-making, especially in relation to strategic land use planning, management of the City's open spaces, design and maintenance of urban infrastructure, development control and education.

The Strategy describes the important values of Newcastle's biodiversity, identifies issues resulting in the continuing loss of biodiversity, provides a clear direction for conservation and provides a framework for prioritising and implementing actions.

The Strategy links to the systems framework of the Newcastle Environment Management Plan (2003) to identify priorities, promote integration across disciplines and programs, support allocation of funds, monitor issues and progress and report performance.

Like many communities Newcastle strives to improve the balance between the conservation and health of the City's natural areas and their biodiversity with design and management of the urban form, social and cultural influences and development and economic growth. Both our ecology and our economy are critical to our identity and cohesiveness as a community and to our social and cultural well being. However it is at the ecosystems level that the basic services on which life itself ultimately depends are provided. Clean air, clean water and food are sustained.

Newcastle, as a sustainable community also has a broader role to play that extends well beyond the City boundaries. Newcastle is located in the estuary of the State's second largest catchment and needs to contribute to and advocate for integrated planning and management processes that take account of our position at a regional and catchment scale context. The Hunter Estuary is recognised as the most significant migratory shorebird habitat in NSW and is protected under four international treaties. What are the implications, responsibilities and opportunities for our City and community to contribute to this global scale ecological issue?

Newcastle City Council also has legal responsibilities and social obligations to support biodiversity conservation. The Local Government Act 1993 requires Council to consider biodiversity, as a principle of Ecological Sustainability, when undertaking the many and varied activities that comprise the role of Local Government. In fact, biodiversity is a consideration in most activities, since it interfaces with so many of our social and economic systems.

We need to take on board new thinking. We need to extend our planning horizons well into the future and to be adaptive in our approach. We need to understand and be responsive to the natural, social and economic systems in which we as a City and community live, work and play.

The purpose of this Strategy is to;

- Set clear policy direction
- Generate and promote a shared understanding of biodiversity and its values in Newcastle
- Establish a strategic framework to inform and guide advocacy, research, planning, education and action for the conservation of Newcastle's biodiversity
- Identify short to medium term priority actions.

It is strategic in that it establishes a clear policy position, identifies priority management needs and focuses ongoing implementation and review through the systems framework of the Newcastle Environmental Management Plan.

Background and additional detail on Newcastle's biodiversity are outlined in the *Newcastle Biodiversity Strategy Background Report* (Fallding 2001) and Council's website www.newcastle.nsw.gov.au.

Words or expressions used in this Plan with special or technical meanings are defined or explained in Part D: Glossary.

Acknowledgment

Our generation and previous generations have lamented the loss and degradation of many of the City's natural areas and the enjoyment and many social and economic benefits they provided.

Over the last decade or so things have turned around. Many community members, community organisations, industries, utility and regulatory authorities, councillors and council staff have shifted their focus to the future. Much is now being done to understand, conserve, rehabilitate, celebrate and promote Newcastle's natural areas, their biodiversity and ecological processes.

In 2003 Council adopted the Newcastle Environment Management Plan (NEMP) that sets out a clear process to maintain this momentum established over the previous 10 years. Many people have contributed to the development of the Newcastle Biodiversity Strategy. The need was recognised for a more detailed understanding of the City's biodiversity values. What is the relationship of these values with social and economic processes, what are the management actions necessary to prevent further loss and ensure the sustainability of our natural areas and their biodiversity into the future?

The Newcastle Environmental Advisory Panel (NEAP), a panel of community members established to provide advice to Council on strategic environmental issues, has been a champion of biodiversity and a substantial contributor to this strategy.

The contribution of the Biodiversity Working Group and the community members who attended earlier workshops has been fundamental in the development of the thinking and the context of this document and the Biodiversity component of the NEMP.

Those who contributed valuable thinking to the development of the Newcastle Biodiversity Strategy include:
Deb Alterator, Col Bartley, Kym Bilham (Coastcare), Danielle Birkbeck, Boyd Carney (Trees in Newcastle), Brian Conroy (community member),Frank Cosgrove, Louise Duff, Tina Harding, Karenne Jurd, Graeme Matthews, Meredith Laing (LHCCREMS), Sharon Pope, Michael Rayner, Peggy Svoboda (Kooragang Wetland Rehabilitation Project), Roger Ward, Mim Woodlands (Newcastle University & NEAP member).

Council also acknowledges the important contribution made by Martin Fallding of LEP Environmental Planning for his research, leadership in thinking and discussion and the preparation of the *Newcastle Biodiversity Strategy Background Report (2001)* and earlier drafts of the Strategy.

PART A

Policy Statement for the Conservation of Newcastle's Biodiversity

Definition:

Biological diversity or "biodiversity" is the variety of life forms, the different plants, animals, micro-organisms and genes they contain. In scientific terms biodiversity is recognised at the genetic level, the species level, populations and ecosystems level.

Vision:

Newcastle values its biodiversity and its ecosystems and will maintain, manage and enhance them as an asset of the City.

Recognising:

- That biodiversity is part of Newcastle's common goods.
- That much of the thinking, the institutional arrangements and the development approaches that have been recorded and witnessed over the previous 200 years have been unsustainable and have resulted in the continuing loss and degradation of our natural areas and their biodiversity.
- That the condition and function of Newcastle's ecosystems and their biodiversity values are intrinsic to the health of our economy, to our social and cultural identity, the value of our landscapes and the well being of the community and that of future generations.
- That our City and its biodiversity is part of a regional and global network of social and ecological systems and that we as a community have a responsibility and a role to play in conservation.
- That the consideration of biodiversity is part of the broader process of applying principles of Ecologically Sustainable Development in all Council activities. This Policy Statement will be used to inform Council's planning processes, land and asset management and education activities with the express objective of no net loss of biodiversity.

In partnership with the community, in our civic leadership and in all our planning and operational activities ***Council will consider potential impacts on, and opportunities for enhancement of the City's ecosystems and their biodiversity and be guided by the following principles:***

- The conservation of biodiversity is fundamental to a sustainable future.
- A whole of systems approach is necessary in planning, decision making and management.
- A precautionary approach is needed where there is a risk of irreversible biodiversity impact.
- The conservation of biodiversity is a core activity of Council.
- Science and education are key change management tools.
- Ecological accounting is a fundamental tool in decision making.
- Fragmentation of habitat and the cumulative impact of fragmentation is a key threatening process to be avoided.
- Biodiversity offsets (conservation activities and outcomes) will be one of the ways we will provide compensation for residual and unavoidable harm to biodiversity caused by development activities and processes.
- Council leadership, a whole-of-government approach and community commitment are required.

In pursuit of the conservation of Newcastle's biodiversity ***Council's Objectives are***:

1. To maintain, manage and enhance natural areas and ecological processes for their biodiversity by active management in all Council activities through:

  - Prioritising the maintenance, management and enhancement of high value terrestrial, estuarine and aquatic natural areas and conservation corridors for the protection of threatened species and ecological communities
  - Monitoring, evaluating and reporting on the condition of Newcastle's biodiversity.
  - Mitigating threats to biodiversity from introduced pest and weed species.
  - Implementing actions that protect and enhance the viability of endangered ecological communities and threatened species.
  - Applying suitable accounting tools and mechanisms that place appropriate valuations on biodiversity and to adopt mechanisms that compensate for loss and unavoidable harm.
  - Managing Newcastle's biodiversity data in a centralised, accessible and integrated manner to facilitate use and application.

2. To establish an understanding and acceptance of Council's biodiversity policy position throughout Council, amongst governments and all sections of the community through education and capacity building.

3. To involve the community as a key partner with government and natural resource managers in planning, biodiversity conservation and management.

4. To recognise and represent Aboriginal peoples' spiritual and cultural values and associations in our conservation of remnant landscapes and natural systems.

5. To assist the Commonwealth Government meet the provision of Australia's international conservation treaties through local actions.

6. To promote Newcastle's biodiversity conservation priorities in State Government and regional planning and natural resource management processes and programs.

PART B

Biodiversity in Newcastle – Global Common Goods

2.1 What is biodiversity?

Biological diversity or "biodiversity" refers to the variety of life forms, the different plants, animals, micro-organisms and genes they contain. In scientific terms biodiversity is recognised at the genetic level, species level population and ecosystems level.

Biodiversity is the basis of the life support systems that contribute towards the functioning and maintenance of ecosystems, landscapes, human settlements and ultimately the quality of life.

It enables the continuing operation of natural processes on which all life depends through its linkages with water, air, soils, climate and other 'ecosystem services' such as food.

Whilst biodiversity forms part of a dynamic natural system relatively little is known about the total extent of biodiversity and interactions between the natural systems that make up our local and the global environment.

Maintaining biodiversity is an essential principle of the concept of ecologically sustainable development. From a moral perspective the international community view biodiversity and its representation at national and local scales not as assets or resources solely for communities or countries but as global common goods.

2.2 Council working toward a sustainable community

Newcastle City Council has been proactive and innovative in establishing and championing a more sustainable approach to City management over the last 10 years. Council's environmental program is coordinated through The Newcastle Environment Management Plan.

Councils charter, as specified in the Local Government Act 1993, requires consideration of the principles of ecologically sustainable development when carrying out their activities. These far reaching regulatory reforms followed on from the World Summit on Sustainable Development (the Rio Earth Summit) in 1992 where the world's governments acknowledged that the current rates of resource utilisation

and loss of the world's natural resources were not sustainable. The conservation of the world's biodiversity and the notion of providing equity between generations featured prominently in the commitments that flowed from the Summit, and for local government was enshrined in Local Agenda 21.

Council adopted its first environmental management plan in 1995 (Newcastle Environmental Management Plan) in response to this policy direction to coordinate and guide environmental management in the City. Much was achieved including importantly the recognition that we need to integrate our planning and management activities within an understanding of how the environment functions in a natural, social and economic systems context.

The Newcastle community is surveyed annually to determine the community perception of the importance of and satisfaction with Council's environmental management activities.

In 2004 Council reaffirmed its commitment to a sustainable future by adopting the strategic objectives of ESD leadership and healthy lifestyle to guide budget investment and actions during its term.

Council adopted a new environment management plan in 2003 (the NEMP). The NEMP focuses on this need for improved stakeholder coordination, integration in planning and management, improved outcome evaluation and review within a systems context.

A State of the Environment (SoE) report for Newcastle is produced annually. A suite of sustainable community indicators have been developed and are monitored and reported every two years.

Important partnerships have delivered research and information, education and capacity building with Council, government and non-government organisations and the community. Significant natural areas of the City are currently being rehabilitated.

All these tools provide Council and the community with an opportunity to work toward a sustainable future. The Newcastle Biodiversity Strategy heightens our understanding and focus on conserving the City's natural areas and their biodiversity.

2.3 Why do we need a Biodiversity Strategy?

Local government in NSW has a significant regulatory responsibility to consider and manage biodiversity within their local government area.

The NSW Local Government Act 1993 sets a Charter for councils to follow that requires the consideration of the principles of Ecologically Sustainable Development when undertaking their activities. These principles included the conservation of biodiversity, the provision of intergenerational equity and improved valuation and pricing mechanisms for the environment.

Similarly, the principal planning regulation, the Environmental Planning and Assessment Act (1979) identifies biodiversity as a key head of consideration for landuse planning and development control. The Threatened Species Conservation Act (1997) further refines the consideration of biodiversity in regulatory requirements for councils. Local governments in NSW are also required under the provisions of the

Local Government Act to report on biodiversity in annual State of the Environment reports.

The Threatened Species Conservation Act (1997) lists a number of Endangered Ecological Communities and threatened and vulnerable species that occur within the City. Council's education, planning and management activities need to take account of regulatory requirements aimed at protecting and conserve these species and ecological communities.

As a coastal city located within the estuary of the State's second largest catchment, Newcastle has a high diversity of natural areas. It is these natural areas that comprise the substantial component of the City's biological diversity. They make a significant contribution towards the character of our City and comprise many complex, interlinked, ecosystems from coastal heaths and rocky shores to mangrove forests, woodlands, rainforest gullies and wetlands.

Novocastrians have a strong beach culture, a love of the Harbour, our wetlands and bushland reserves. These natural features are renowned worldwide and attract many visitors to the City each year. The Newcastle community is very aware of the value of the City's natural areas and supports the need for strong measures to protect their condition and function. Newcastle has a unique opportunity to conserve its remaining natural areas and build and strengthen biodiversity conservation initiatives.

Urban development, agriculture, mining, industry and transport have all had significant impacts on Newcastle's biodiversity since the European settlement. Despite extensive clearing of native vegetation, much biodiversity still remains, especially in wetland and estuarine environments, inter tidal rock platforms, forest areas to the west, and coastal forests near Glenrock Lagoon. Blackbutt and Jesmond Reserves, whilst surrounded by urban development, conserve large areas of bushland.

Many smaller bushland remnants also occur throughout the Newcastle area. Even individual remnant trees provide habitat for important elements of biodiversity that are mostly taken for granted. As a collective they provide linkages between larger habitat areas.

Habitats that remain reflect the broad landscapes present in the area, including the Hunter River estuary, coastline and forested ridges and valleys. The remaining habitat areas contribute towards providing regional and local habitat corridors that allow many native animals and plants to maintain viable breeding populations. Without this habitat, there would be significantly less variety in the birds and other animals that enrich the daily life of the Newcastle community.

Like many communities Newcastle strives to improve the balance between the conservation and health of the City's' natural areas and their ecosystems with development and economic growth. Both these factors are critical to our identity and cohesiveness as a community and our social and cultural well being. However it is at the ecosystems level that the basic services on which life itself ultimately depends are provided. Clean air, clean water and food are sustained.

To achieve this balance Council and the community need to ensure that biodiversity has a respected and heard seat in our city planning and management. Council's role in managing the city is broad and varied, extending from leadership and advocacy, planning, development control, infrastructure design and management, openspace management, economic and social planning and importantly talking with the community.

Whilst much of the biodiversity regulation focuses on threatened species (species at risk of extinction) and their management, threatened species in fact comprise only a small component of biodiversity. The scientific basis of the threatened species management approach often fails to recognise the inherent local and regional biodiversity values at the ecosystems level.

In an urban context like Newcastle these local values are ultimately important to the way we and others view the City. The enjoyment we get from many nature-based recreational experiences, the amenity and visual appeal of Newcastle's natural landscapes and the quality of the air we breathe, the water we drink and the local seafood we are fortunate to have access to, are related to Newcastle's Biodiversity.

This strategy aims to broaden the biodiversity management focus and scale toward the intrinsic values that exist in and amongst many of the City's natural attributes, be they back yard and street scape, coastline, bushland reserves to our larger and complex estuarine and riverine wetland systems.

2.4 What does the Newcastle Biodiversity Strategy Aim to do?

The Newcastle Biodiversity Strategy aims to:

- Set clear policy direction for the conservation of Newcastle's biodiversity
- Generate and promote a shared understanding of biodiversity and its values in Newcastle
- Establish a strategic framework to guide advocacy, research, planning, education and action for the conservation of biodiversity
- Inform government, council and community planning and actions
- Enhance the integration of biodiversity in key policy, planning, education and management programs
- Identify priority short to medium term actions

We need to take on board new thinking. We need to extend our planning horizons well into the future, we need to be adaptive in our approach and we need to understand and be responsive to the natural, social and economic systems in which we as a City and community live, work and play. The Strategy will help the City to meet this challenge.

2.5 Local, Regional, National and International Context of Newcastle's Biodiversity.

Most of Australia's plants and animals are found nowhere else in the world. Due to the diversity of our plants and animals Australia is classed as one of the worlds seventeen "mega diverse" countries. Yet since the occupation of Australia by European settlers some 200 years ago Australia has recorded the highest rate of species extinction of any country.

Biodiversity is referred to internationally as “global common goods”. In other word biodiversity is not private or public goods or commodities to be harvested, traded or destroyed for the benefit of individuals, communities, corporations or governments without regard to the wider value of biodiversity and consequence of their actions.

The Hunter Estuary is recognised as the most important migratory shorebird habitat in NSW. The Hunter estuary wetlands are protected under four international treaties in recognition of their value as habitat for migratory waders that visit the estuary from the northern hemisphere during our summer. What is Newcastle’s role as an advocate, in planning and in undertaking on-ground works in assisting Australia meet its commitment to these treaties and supporting global biodiversity conservation?

Newcastle, located in the Hunter river estuary, the State’s second largest catchment also needs to advocate for and to contribute to more local, integrated planning and management processes that take account of biodiversity in a regional and catchment scale context.

In 2003 the State Government established a comprehensive natural resource management framework through the formation of 13 Catchment Management Authorities across the state. The Hunter - Central Rivers Catchment Management Authority, that includes Newcastle and the Hunter in its area, identifies biodiversity and management of natural areas and ecological systems as a priority management policy.

Newcastle has been dubiously credited as the site of introduction to Australia of the voracious coastal weed Bitou Bush. The weed is so invasive and has displaced so much native vegetation and associated biodiversity around the Australian coastline that the Commonwealth Government has declared it a Weed of National Significance.

What are the implications, responsibilities and opportunities for our City and community to contribute to biodiversity conservation at a regional, national and global scale?

Why is biodiversity important?

3.1 Biodiversity and ecological sustainability

Biodiversity contributes to the maintenance of essential ecological processes. It also forms an essential component of air and water quality, visual amenity, cultural identity, and agricultural productivity. Maintaining self-sustaining natural systems is essential for achieving sustainable economic and social development. There are also ethical and moral arguments for conserving biodiversity.

Newcastle has a surprising wealth of biodiversity. It is an integral element of our natural landscapes and helps make Newcastle a special place. The City's beaches, bushland, harbour and wetlands are internationally recognised, and are home to many natural surprises. This natural heritage contributes to the quality of life and provides the community with many social and economic benefits.

What role does our generation have to ensure that we maintain the City's biodiversity and remnant natural areas for the enjoyment and benefit of future generations?

Biodiversity conservation underpins ecologically sustainable development (ESD). It is one of the four principles of ESD prescribed in the charter of local government in the Local Government Act 1993. Biodiversity provides a measurable indicator of the extent to which development achieves sustainability. Changes in biodiversity reflect the sustainability of development and human activities. It therefore provides an important indicator of environmental change. This was recognised in the *Newcastle Environment Management Plan 2003,* which identified biodiversity as a key environmental management issue.

3.2 Social, cultural and economic issues

In addition to the environmental benefits there are strong social, cultural and economic reasons to support and implement biodiversity conservation initiatives. These aspects collectively represent dimensions of ecological sustainability for Newcastle and provide issues that need to be considered if we are to achieve a more balanced consideration of social, economic and environmental values in our decision making. Council's governance policies, plans and processes provide the mechanisms that allow this balance to be struck. The following examples are not comprehensive but aim to demonstrate values that improve the valuation of the environment in decision making.

Economic

The quality of our local environment and its biodiversity provide opportunities for investment in local tourism and recreation industries. Poorly considered development often results in opportunity costs as economic trends shift over time. The protection and maintenance of

Newcastle's natural assets can minimise the need for expensive repair and remediation activities that can result from development, off-site and cumulative impacts. Over the last two decades significant costs have been incurred by Council and governments in remediating Throsby Creek, Kooragang Island and Hexham Swamp. Planning has commenced to scope remediation works on Stockton Beach and the south arm of the Hunter River. A study undertaken in 1999 indicated that the surfing industry returned over $7 million annual to the local economy. Precaution is needed in planning where uncertainty exists.

Social and Cultural

Newcastle's natural areas help define the character of the City, its community and the way the City is viewed by others. The quality of a city's natural environment, its character and reputation and its social and cultural well being are important considerations for many investors. Newcastle, Australia's sixth largest City, has an international reputation for offering its community a high quality of life. The City is renowned for its impressive coastline, beaches, bushland and estuary.

The beaches, bushland reserves like Blackbutt, the Harbour and the wetlands are important casual and organised, social and recreational meeting places that help strengthen social cohesion. A growing number of community members are choosing to volunteer their skills and time toward projects aimed at repairing and conserving Newcastle's natural areas and their biodiversity. The maintenance of biodiversity provides opportunities for the continuation of Aboriginal culture, identity and spiritual attachment to land and is an important opportunity for Aboriginal reconciliation. The growing community appreciation and awareness of Newcastle's environmental values, and expectations for their conservation, establishes a more cohesive community voice in political advocacy.

Biodiversity Management in Newcastle.

4.1 Information review

Newcastle retains important biodiversity values. While some ecosystems such as wetlands are relatively well understood, there are major information gaps for most ecosystems within the City. Site-specific data, data on threatened species, threatening processes and marine and aquatic biodiversity is lacking. Such data is important for management purposes, including information on present condition, ongoing management and monitoring.

A major shortcoming is that the data that does exists in not in a centralised and accessible location.

In Newcastle, land use and development substantially affect long-term biodiversity conservation. Approximately 69% of the local government area is currently urbanised (industrial, residential, recreational, commercial and mining uses) (Newcastle City Council 2005). Most protected natural areas are wetlands (19.5%), and only 3% is urban bushland, some of which is unprotected or subject to future development. Potential for conservation and for the loss of natural areas will occur mainly in the 11% of the local government area within the 7(c) Environmental Investigation Zone identified in the Newcastle LEP 2003.

Habitat management in Newcastle has focussed substantially on restoration and rehabilitation, as opposed to regeneration. However, there is significant potential to lose biodiversity from remaining bushland areas of the City as a result of increased utilisation associated with recreational activities and population pressure or inappropriate management of reserved areas. The initiation of the City Greening program in 2004 aims to redress this situation. Together with the *Newcastle Biodiversity Strategy* and other natural resource management plans a co-ordinated approach is now available to influence the extent to which Newcastle's biodiversity can be retained in the long term.

4.2 Biodiversity Values in Newcastle

The Newcastle Local Government area has a number of unique biodiversity values associated with its geophysical form and geographical locale. These features create the diversity and richness that we see in the City's landscapes, natural features and the many native species that occupy its habitats.

These values include:

- **A high species richness and diversity.** Glenrock State Conservation Area, located on the coast in the southern area of the City, has the most diverse assemblage of plant communities of all the State's national parks and reserves. The area contains a number of threatened species and provides a major corridor to natural areas south along the coastline and west toward Blackbutt Reserve and beyond.
- The Hunter Estuary wetlands have been identified as **the most significant migratory wader bird habitat in NSW.** These wetlands also have been recognised as providing important drought refuge for a range of waterfowl and wader species of state and national significance. The Kooragang Wetland Rehabilitation Project, the Hexham Swamp and Kooragang Nature Reserves, the Hunter Wetlands Centre provide an assemblage of wetland reserve systems within the lower Hunter estuary.
- **Areas of the Hunter Estuary wetlands are recognised and protected under international treaties** signed by the Commonwealth Government. These include the Ramsar Convention, the Japan Australia Migratory Bird Agreement, the China Australia Migratory Bird Agreement and the Bonn Convention. Newcastle has a sister wetland affiliation with the City of Kushiro in Japan that recognises the importance and relationship of the wetland habitats in the two Cities.
- The diversity of landscapes in the City, shaped by the coastline, the Hunter River estuary and floodplain and the forested ridgelands and gullies have created **a high diversity of representative ecosystems** which in turn supports a high species diversity.
- **Newcastle has a number of endangered ecological communities listed in NSW regulation**. The Littoral Rainforest, Lower Hunter Spotted Gum and Ironbark forest communities, Coastal Salt Marsh communities and *Themeda* grasslands communities on coastal headlands are recognised under the Threatened Species Conservation Act. These communities should be considered "no net loss" communities.
- A number of the City's conservation reserves and natural open space including Blackbutt Reserve and Jesmond Bushland areas have **sufficient "core area size" to maintain local ecosystem functions.**
- **The Hunter River Estuary is part of the largest estuary and the largest coastal sand barrier system on the NSW coast** comprising significant diversity and richness of habitats.
- The diversity of ecosystems and richness of species in the City is reflected in the **high number of threatened species** listed under State and Commonwealth legislation.
- Research has shown **the intertidal rocky shores south of the Hunter River have a high biological diversity** and are important roosting and feeding sites for a number of threatened shore birds.
- **The Hunter Estuary is located on the boundary of the Sydney Basin and NSW North Coast Bio-regions** and as such provides important ecosystems linkage between bio-regions and has a unique representation of species from these bioregions.
- **The Wetlands Centre at Shortland and the Kooragang Wetland Rehabilitation Project are nationally and internationally renowned** as centres of excellence in research, education, rehabilitation and management.

4.3 Ecological communities

The main natural ecological communities occurring within Newcastle are:

Wetlands and estuarine communities - these comprise the largest area of natural ecosystems within Newcastle, including 7 different mapped vegetation communities. These wetlands form one of the largest expanses of coastal wetlands in south-eastern Australia and are of international significance as habitat for migratory wading birds.

Open forests - there are contiguous areas of remnant open forest remaining in Newcastle's western and south western areas. Open forests are reserved within Glenrock State Recreation Area. Additional large remnants remain within the built up areas, including Blackbutt Reserve, Jesmond Park, George McGregor Park, Adamstown Army reserve and John Hunter Hospital. Housing development and proposed transport corridors and other infrastructure could result in a reduction in the size and further fragmentation of these remnant open forest communities.

Coastal forest and heath vegetation – Although severely degraded through development and the noxious weed Bitou Bush coastal vegetation occurs at Stockton and Glenrock. A Coastline Vegetation Management Plan is currently being developed in recognition of the condition and importance of the City's coastal vegetation communities. Six different communities have been mapped.

Rainforest and moist forests - only small areas of these types of forest occur, in 4 mapped communities, mainly at Blackbutt Reserve and Glenrock. Important remnants exist in the gullies and drainage lines around the south-west and western margins of Hexham Swamp.

Grasslands - Only very small areas of this community occurs, restricted to coastal grasslands in King Edward Park, Shepherds Hill area and the Trig. *Themeda* Grassland communities on coastal headlands received interim listing, in 2005, as a threatened ecological community under the Threatened Species Conservation Act.

Marine and intertidal ecosystems - These ecosystems represent an important part of Newcastle's biodiversity, but are relatively poorly understood from a scientific point of view. They include sandy beaches and dunal systems, the extensive intertidal rocky shores south of the Hunter River and near shore ocean waters. Recent work associated with the Newcastle Coastline Management Plan 2003, identifies the rock shores as having high marine biodiversity. They provide important habitat to a number of rare shorebirds including Oyster Catchers, the Little Tern and the Fairy Penguin.

4.4 Key threats to Newcastle's Biodiversity

Like much of Australia the loss of biodiversity in Newcastle has been significant since European settlement of the area commenced in 1797. The development of coalmines and the subsequent heavy industrial base that was established around the port have determined the nature of many impacts.

Agriculture, timber harvesting, filling and drainage of wetlands, filling and reclamation of waterways in the Estuary, mining and industrial development, urban development, erosion and runoff from urban areas, alteration to surface and ground water hydrology, utility services infrastructure, habitat fragmentation, competition from introduced weed and vertebrate pest species have historically caused biodiversity loss in Newcastle.

Historical records reveal that by 1820 the majority of the Cedar and Ash trees had been harvested from the Hunter estuary. Of the 14 islands that existed in the Estuary only six remain. Over 80 kilometres of natural creeks have been replaced with concrete drains, the length of foreshore area in the estuary has been reduced by over 50%, and nearly 200 tide and flood control devices have been installed within the Estuary and adjacent wetlands. Only about 10% of the terrestrial native vegetation remains. The littoral rainforest communities on the Hunter River flood plain that contained the Cedar and Ash trees on which the settlement of Newcastle was founded have all gone. The 20% of remaining native vegetation along the coastline is heavily degraded with Bitou bush, an introduced weed.

Whilst the rate of habitat loss has slowed we continue to be faced with a number of key threatening processes that require new approaches to planning and management. They include:

- Development of rural and "greenfield" lands for residential and industrial purposes.
- Stormwater runoff from developed areas impacting on remnant creeks, riparian zones and downstream wetlands.
- Invasion of noxious and environmental weeds into remnant bushlands, wetlands and conservation reserves.
- The expanding footprint of urban areas, transport and utility service infrastructure in areas of conservation value.
- Growing recreational pressures on urban bushlands and conservation areas.
- Fragmentation of habitat as a result of limited integration in planning.
- Changes to the hydrology in the Hunter river estuary as a result of increased tidal flows, reclamation, filling, sea level rise and water extraction.
- Lack of a shared vision and integrated planning for the Hunter Estuary within governments and between government departments and organisations.

4.5 Council activities and programs

In 1995 Council adopted an environmental management plan in recognition of growing community expectations, the important value of the City's remnant natural areas and the need to redress environmental degradation and on-going threatening activities. In the last 10 – 15 years

Council's spending on the environment has increased ten fold. In 2002 the Government permitted Council to establish a special rate, the Newcastle Environmental levy, to fund many biodiversity related projects.

The environmental levy, together with supporting funds from government grants, the Hunter- Central Rivers Catchment Management Authority, the Hunter Water Corporation, industry and business partners has enabled significant planning, education and works to be undertaken on the coast, in the estuary and wetlands, along urban creeks and in bushland areas.

Further improvements in biodiversity conservation have been achieved through community actions funded under the Community Environmental Small Grants program and through the activities of many community and non-government organisation including Trees in Newcastle, the Hunter Wetlands Centre, Conservation Volunteers Australia and Hunter Bird Observers Club.

The Newcastle Environment Management Plan, adopted by Council in 2003, establishes a process to consider the management of the natural areas at a system level, to identify priorities and coordinate resources.

The Newcastle Stormwater Management Plan (1999), the Greenspaces Strategy (2000), the Newcastle Coastline Management Plan (2003), the Hunter estuary management program (under development), the Newcastle Green Corridors Plan (2005) and the City Greening programs (2004) have contributed significantly to knowledge, planning and on-ground actions.

The Newcastle Local Environment Plan (2003), Council's key strategic landuse planning instrument, strengthens the protection of natural areas through landuse zones and provisions that recognise areas of high biodiversity value and control potentially threatening activities.

A detailed list of Council activities and programs that target conservation of natural areas and biodiversity is included as Appendix 2.

4.6 Biodiversity and Newcastle's Urban Forest

The management of trees in the City has been an issue of growing concern within Council and the community for a number of years. The trees of our native bushland, street trees, trees in parks and back yards collectively comprise what is now referred to as Newcastle's urban forest. The urban forest provides many benefits to the City and the community including shade, improvements to air quality, valuable landscape and streetscape character and water management benefits. Importantly it comprises a significant component of Newcastle's biodiversity.

Council is currently preparing a policy for Newcastle's Urban Forest that will guide tree management in the City and support the conservation and enhancement of biodiversity.

PART C

Implementing the Newcastle Biodiversity Strategy

5.1 How will the Strategy be implemented?

Part C of the Newcastle Biodiversity Strategy aims to identify key processes and activities within Council that influence biodiversity outcomes in the City. It aims to identify mechanisms to coordinate resources and prioritise actions that guide implementation and review of the Strategy within Council's governance processes.

It does not map and specify biodiversity management needs at an allotment scale but rather takes a broader landscape perspective and focuses on medium to long-term planning and management programs for implementation.

It contains an Action Table to guide activities over the next 3 years. The Action Table links the Objectives in the Policy Statement for the Conservation of Newcastle's Biodiversity to strategies, prioritised actions and areas of responsibility.

It identifies the Newcastle Environment Management Plan, and its Operational Chart (see Figure 3), as the key organisational process for coordination, prioritisation, implementation, monitoring, reporting and review.

5.2 Priority Biodiversity Management Themes for Newcastle

The priority biodiversity themes, critical to develop and integrate into all Council activities if Newcastle is to achieve the vision and objectives of the Policy Statement, were identified in a biodiversity planning workshop hosted by the Newcastle Environmental Advisory Panel in August 2004 and attended by internal and external stakeholders. They are:

- **A policy and planning framework that establishes clear direction and supports implementation through responsive tools and mechanisms.**

  This Strategy establishes a policy framework that sets a direction for management of Newcastle's biodiversity. However it will be the integration of and a commitment to the Principles and Objectives in

planning processes, management activities and the development of new supporting tools and mechanisms that will be the key to achieving the Vision. Monitoring and evaluation through the Environmental Advisory Panel, the NEMP and annual reports will support and refine implementation.

- **Community engagement including, a biodiversity communication and education program that is value based.**

  There is a critical need to engage all sectors of Council and the community and government. We need to build an understanding and appreciation of biodiversity values in Newcastle, the direction and principles established by the Policy Statement for the Conservation of Newcastle's Biodiversity contained in this strategy and what we have to do to achieve the objectives.

- **Research supported by data compilation, analysis and a data management system that is centralised and accessible.**

  A significant amount of data exists on Newcastle's biodiversity, from the ecology of coastal rock platforms, macro-invertebrates in creeks, threatened species occurrence, wetland communities, and migratory shorebirds to bushland reserves. However significant gaps remain in our knowledge. If we are to understand planning and management needs, and importantly understand how the City's biodiversity exists and functions within a systems context.

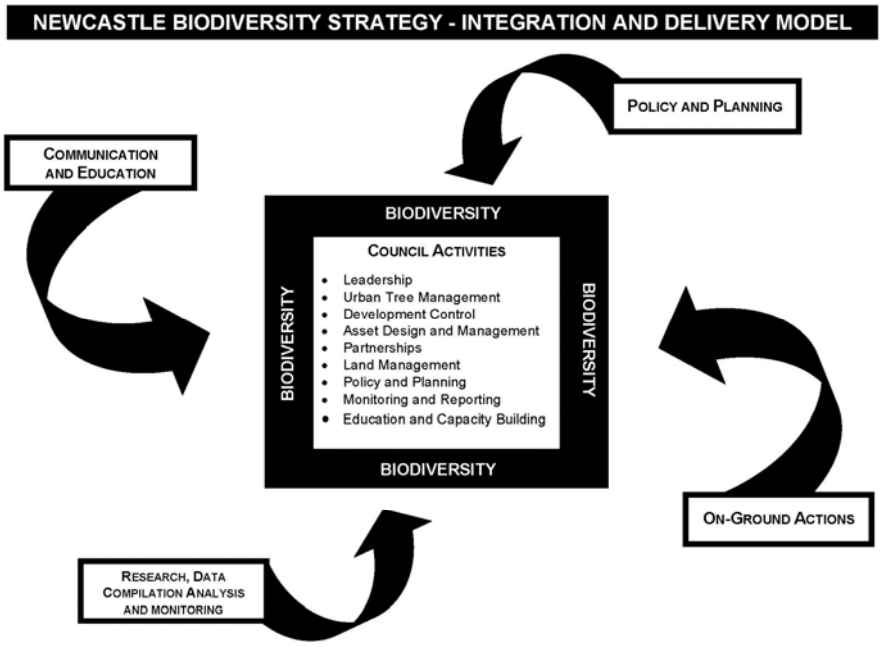
- **On-ground actions, informed by science and research, delivered by appropriately skilled staff, community and volunteer organisations.**

  Informed and well-planned management of the City's urban bushlands, remnant wetlands and coastal vegetation and marine and estuarine ecosystems is required. Bush regeneration and coast and estuarine ecology skills need to inform on-ground actions in many areas. Actions need to consider Council's priority objectives, target priority issues, support the viability of corridors and respond to opportunities. Community actions need to be informed and supported wherever possible.

- **Partnerships are a key to achieving the vision.**

  Many government agencies and corporations, NGO's, industry and community groups are actively working to conserve and enhance the City's natural areas and biodiversity. The establishment and support of partnerships will be critical in sharing information, providing specialist skills and knowledge, trialling new approaches and delivering on-ground action.

Figure 1: Represents the integration of priority themes for biodiversity management into Council activities.



5.3 Actioning the Newcastle Biodiversity Strategy

The implementation model for the Newcastle Biodiversity Strategy, outlined **in Figure 2**, is based on the systems management approach contained within the Newcastle Environment Management Plan (see Figure 3 Operational Chart for the NEMP). The Biodiversity Theme Team is allocated responsibility for coordinating Council resources and activities, identifying critical gaps and supporting the implementation of the actions identified in the Action Table (Figure 4). The systems management approach, through monitoring, evaluation and review will facilitate continuous improvement that supports on-going implementation of Council's Policy Statement for the Conservation of Newcastle's Biodiversity.

The model, as colour coded, aims to;

- Identify the broader strategic planning frameworks that support biodiversity conservation as a key desired outcome. The Newcastle Urban Strategy (NUS) is the City's peak strategic planning document and aims to set out a broad vision and direction for a sustainable Newcastle. The Newcastle Environment Management Plan is the key strategic environmental plan for Newcastle that aims to coordinate and integrate environmental policy and objectives into Council activities and processes.
- Identify the environmental themes underpinning the NEMP. The Biodiversity Theme Team will have the role of overseeing the prioritisation of Actions, the review of progress and the adaptive management needs of the Strategy.

- Identify priority activities for implementation through Council's core plans, governance processes, regulatory activities, programs and partnerships.

The Newcastle Environment Management Plan identifies eight priority environmental themes, including biodiversity, and contains an Operational Model (See Figure 3) based on a systems approach. The Operational Model aims to promote integration across the eight environmental themes, and Council processes and facilitate communication, evaluation, monitoring and reporting. It links to the Corporate Management Plan and budget program that includes the Newcastle Environmental levy, to plan and resource implementation and action.

The key mechanism for implementing this Biodiversity Strategy will be the activity of the Biodiversity Theme Team identified in the NEMP Operational Chart. It will be at this level that the priority biodiversity themes contained in Section 5.2 can be integrated across all council activities and incorporated into plans and processes. It will be the responsibility of the Biodiversity Theme Team to evaluate, monitor and report progress on priority actions and linkages.

It will be through the NEMP that the direction provided in this strategy can be focused in core strategic policies and plans.

Figure 2: The Newcastle Biodiversity Strategy conceptual implementation model.

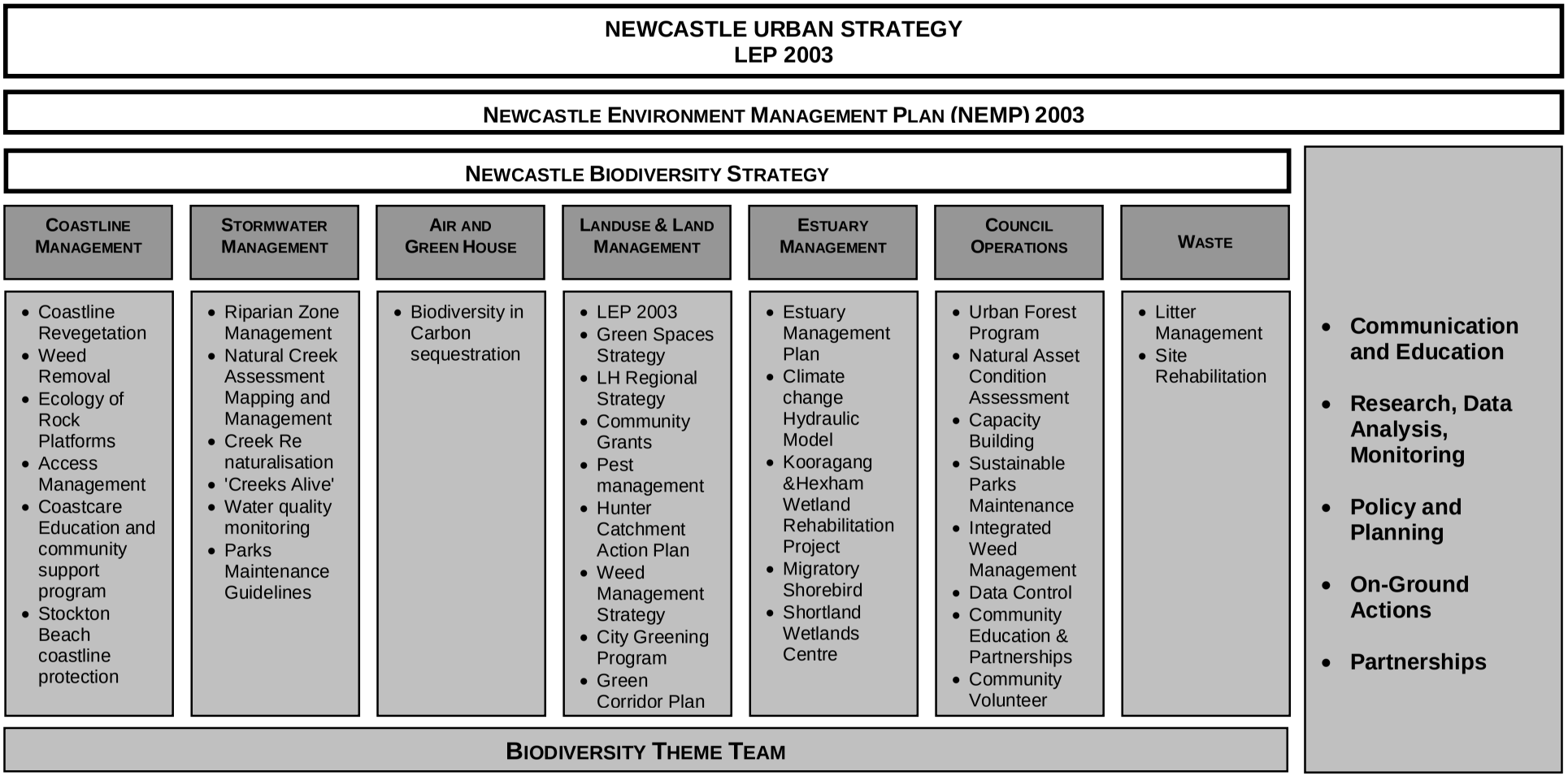


Figure 3: The Newcastle Environment Management Plan (2003) – Operational Chart.

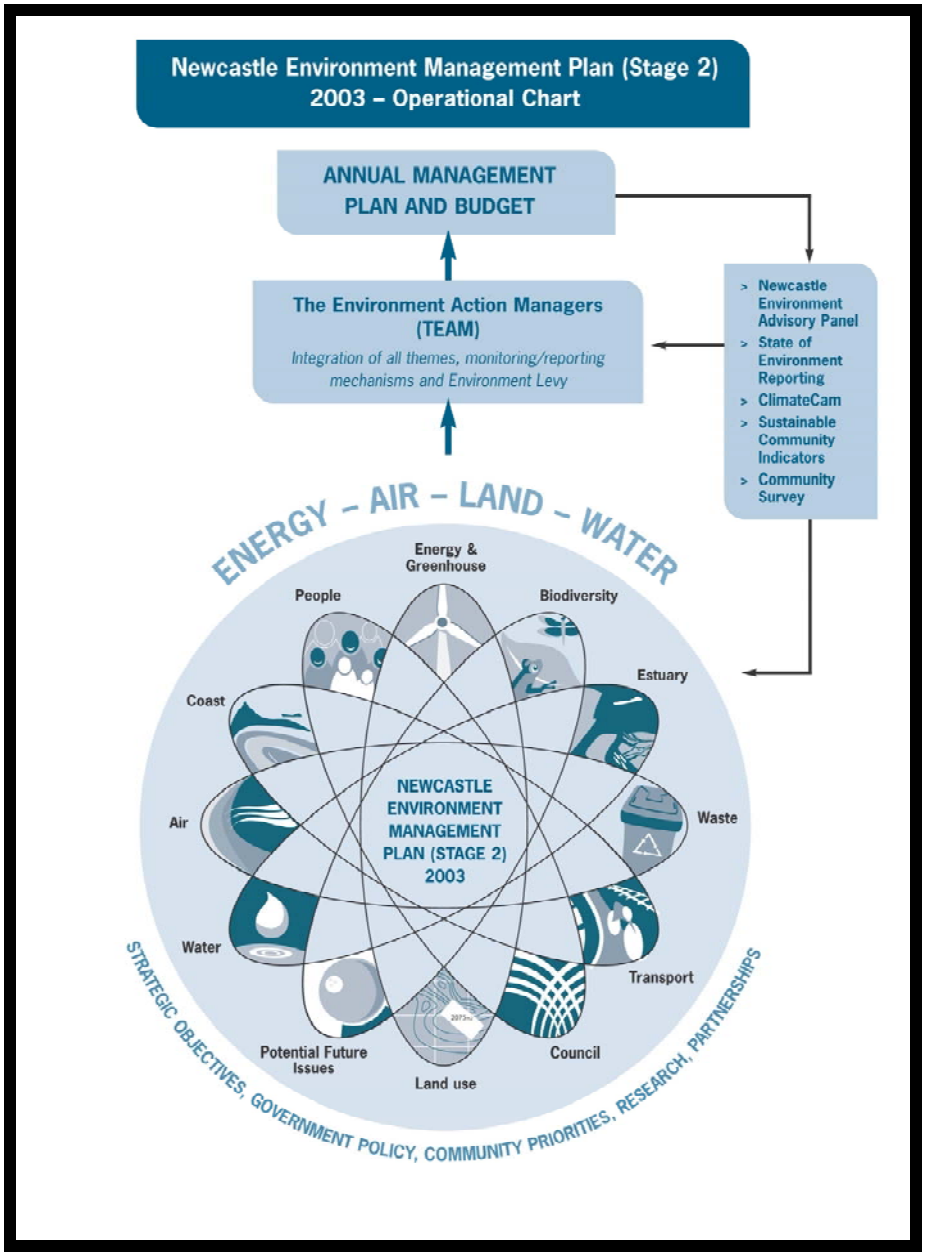


Figure 4: Action Table

The actions proposed in Figure 4 reflect many existing Council projects and the partnered and linked activities of other stakeholders that aim to maintain or improve biodiversity in the City. It also identifies and outlines proposed actions that address key gaps.

The Action Table forms the basis of a 3 year work program that will be guided by the Biodiversity Theme Team under the NEMP Operating System. The Operating System allows the Action Plan to be updated over time. Proposed actions identified to address key gaps will be subject to consideration in annual Group Work Programs and Council's annual Management Plan and Budget

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
1. To maintain, manage and enhance natural areas and ecological processes for their biodiversity through active management in all Council activities	• Prioritising the maintenance, management and enhancement of high value terrestrial, aquatic natural areas, green spaces and green corridors.	• E. Complete and document the Natural Areas Condition Assessment and incorporate in Council's Natural Resource Data Management system to inform work programs and projects. • P. Develop, prioritise and implement an annual action plan for the Green Corridor Plan and Landscape Plan (2005)	City Strategy City Strategy, City Services and Presentation and Community Partnerships

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• E. Coordinate all NRM strategy and project planning to achieve an integrated approach to biodiversity conservation (eg. Estuary Management program, City Greening Program, Coastline Management Plan, Stormwater Management Plan, Urban Bushland Condition Assessment, Green Corridor Plan, City Greening Program, Weed Management Strategy, Natural Asset Data Management System, Urban Forest Program.).	NEMP TEAM, Biodiversity Theme Team, Education for Sustainability Theme Team
		• P. Incorporate the biodiversity Policy objectives and strategies into the review of Plans of Management (PoM's).	City Strategy
		• E. Implement the Environmental Guidelines for Parks and Open Space (draft) and other supporting operational guidelines and tools.	City Services and Presentation
		• E. Identify and map priority estuarine conservation values and management needs in the Hunter Estuary Management Study & Plan	City Strategy (Coast and Estuary Management Committee)

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• E/P. Incorporate the identification of biodiversity values and management issues in the planning review of land zoned 7(c) Environmental Investigation.	City Strategy, Newcastle Environmental Advisory Panel
		• E. Implement priority actions identified in the Newcastle Coastline Management Plan (2003) that delivers biodiversity outcomes.	City Strategy, Community Partnerships
		• E. Maintain partnership support for the Kooragang Wetland Rehabilitation Project and the Hexham Swamp Rehabilitation project.	City Strategy (Coast and Estuary Management Committee)
		• E. Support appropriate resourcing of the Community Greening Centre to facilitate delivery of prioritised community based actions.	City Services and Presentation
		• P. Review and determine the suitability of current indicators in the NEMP and Newcastle Sustainable Community Indicators to ensure appropriate monitoring capability exists to support the implementation of Newcastle's Biodiversity Policy Statement.	Biodiversity Theme Team, City Strategy

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
	• Manage threatened biota including Threatened species and their habitat and scheduled ecological communities.	• P. Incorporate biodiversity provisions in the development of the Newcastle Urban Forest Policy to promote biodiversity outcomes in Council tree management programs.	Development and Environment
		• P. Prepare a discussion paper on threatened species and endangered ecological communities management needs in Newcastle and establish and monitor implementation of appropriate actions.	Biodiversity Theme Team, City Strategy
		• P. Prepare a discussion paper on key threatening processes with the Newcastle LGA and develop and monitor appropriate actions.	Biodiversity Theme Team, City Strategy
		• E. Finalise development and implementation of the Riparian Zone Management Policy.	Stormwater Task Force
		• E. Implement the Newcastle Weed Management Strategy.	Biodiversity Theme Team, City Services and presentation
		• E. Continue and promote the Water Bug Survey (through the Creeks Alive Project) as a key ecosystems health monitoring program.	Community Partnerships

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• P. Develop and implement a pest animal control protocol as part of the Newcastle Companion Animal Management Plan.	Development & Environment, City Service & Presentation
		• E. Ensure the Estuary Management Study and Plan identifies priority management needs for Ramsar sites and migratory waders in the Hunter estuary.	City Strategy (Coast and Estuary Management Committee)
		• E. Ensure the Newcastle Bushfire Management Plan is aligned with the Policy Statement for the Conservation of Newcastle Biodiversity.	Development and Environment, City Services and Presentation
	• Applying suitable accounting tools and mechanisms that place appropriate valuations on biodiversity	• P. Participate in the development of the Lower Hunter "Biodiversity Banking" tool proposed for the Lower Hunter Regional Strategy and the proposed Regional Conservation Plan.	Biodiversity Theme Team, City Strategy
		• P. Develop an options paper to initiate the establishment of a biodiversity compensation framework for Newcastle that support Council's Policy for the Conservation of Newcastle's Biodiversity.	Biodiversity Theme Team

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
	• Manage Newcastle's biodiversity data in a centralised, accessible and integrated manner to facilitate use and application.	• E. Develop a centralised natural resources data management system within the corporate Asset Management Program.	City Strategy (Assets)
		• P. Develop a map based biodiversity and NRM decision support tool for the development assessment process.	Development and Environment, City Strategy (Assets)
	• Continue to research and build information on Newcastle's Biodiversity	• P. Determine priority research needs and establish research projects.	Biodiversity Theme Team
		• E. Complete the study into the ecological values of the intertidal rocky shores and use it to guide education, management and advocacy.	Community Partnerships, City
2. To establish an understanding and acceptance of Council's biodiversity policy position throughout Council, amongst governments and all section of the community through education and capacity building	• Support the capacity of Council and the community to understand values, management needs and actions.	• P. Provide education and training to internal staff to support implementation of the Newcastle Biodiversity Strategy.	Biodiversity Theme Team and Education for Sustainability Theme Team

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
	• Establish and maintain appropriate education programs that reflect the value of biodiversity in Newcastle and relevant management issues.	• E. Support education, awareness and participation through existing community programs including Good Bushland Neighbours, Coastcare, Bushcare, Creeks Alive, Community Greening Centre, Clean and Green News, Blackbutt Volunteers, Companion Animal Management.	Community Partnerships, City Services and Presentation, Development and Environment
		• E. Enhance and maintain the biodiversity page on Council's web site, including links to project partners eg. The CMA, The Hunter Wetlands Centre, NPWS, Hunter Bird Observers Club, Society of Frogs and Reptiles, Conservation Volunteers Australia and Trees in Newcastle.	Biodiversity Theme Team and Communications.
		• E. Report the condition of Newcastle's biodiversity in the Annual SoE report and Sustainable Community Indicator Report.	Development and Environment, City Strategy
		• E. Support the capacity of Community Greening Centre and Blackbutt Reserve Management to address biodiversity in their community engagement programs.	Greening Broker, City Services and Presentation

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
3. To involve the community as a key partner with government and natural resource managers in biodiversity conservation and management.	• Establish frameworks where Council, governments, external natural resource managers, community and volunteer organisations and the community work collaboratively to implement priority biodiversity activities.	• E. Maintain key community partnership programs including the Bushcare, Coastcare and Creeks Alive programs.	Community Partnerships, City Services and Presentation
		• E. Support the NCC City Greening program to enhance partnerships for delivery of biodiversity outcomes in Parks.	Greening Broker, City Services and Presentation
		• E. To use the annual education for sustainability (DESD) action plan to guide community education and engagement initiatives.	Community Partnerships
		• E. Continue to support and promote the Environment Achievement Awards.	Community Partnerships
		• E. Establish partnerships with the Catchment Management Authority that assist with delivery of relevant catchment targets in Newcastle, identified in the Hunter Catchment Action Plan.	Biodiversity Theme Team

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
	Mitigate the impacts of urban runoff on sensitive receiving waters of Hexham Swamp and the Hunter Estuary	• E. Continue the community's participation on natural resource management based 355 advisory committees (NEAP, Coast and Estuary Management Committee, Blackbutt Management Committee).	Various Groups
		• E. Fund community actions through the annual Community Environmental Small Grants Program.	Community Partnerships
		• E. Implement the priority actions identified under the Newcastle Stormwater Management Plan to mitigate impacts of runoff into Hunter Estuary wetlands.	Stormwater Taskforce
		• E. Support the activities of the Newcastle Catchment Forum.	Stormwater Taskforce
4. To recognise and represent Aboriginal peoples spiritual and cultural values and associations in our conservation of remnant landscapes and natural systems.	• Consult and liaise with relevant Aboriginal groups and traditional owner.	• P. Brief the Guraki Committee on Council's biodiversity strategy and program to support the role of the Guraki Committee in advising in project development and implementation.	City Strategy

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• P. Brief the Biodiversity Theme Team and relevant 355 Committees on the findings of the Newcastle Aboriginal Cultural Heritage Study and its applicability to the achievement of Biodiversity Objectives	Development and Environment
	• Ensure Council's strategic NRM based plans consider Aboriginal cultural issues in their development.	• E. Consult with Aboriginal stakeholders and represent traditional values and culture in project design where appropriate.	Biodiversity Theme Team, Development and Environment, City Strategy.
5. To assist the Commonwealth Government meet the provision of Australia's international treaties through local actions.	• Seek consideration and direction on management issues and priorities through the Hunter Estuary Management Study and Plan.	• E. Contribute to the activities of the Hunter Estuary RAMSAR Managers network coordinated by the Hunter Wetland Centre.	City Strategy
		• E. Continue to support and celebrate Newcastle's Kooragang Kushiro Sister Wetlands Relationship Agreement.	City Strategy, Coast and Estuary Management Committee
		• E. Advocate for caution and wise use of the Hunter Estuary to mitigate ecological impacts from development activities.	Coast and Estuary Management Committee

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• E. Work collaboratively with the Commonwealth Government, Department of Environment and Conservation, the Catchment Management Authority and the Hunter Bird Observers Club to protect habitat and monitor and report on migratory waders in the Hunter Estuary.	City Strategy
6. To promote Newcastle's biodiversity priorities in State and Regional planning and natural resource management activities.	• Ensure that Council's Biodiversity Policy position is presented in representations by Council in regional planning processes.	• P. Formally communicate Council's biodiversity policy position to relevant government agencies and organisations. • P. Contribute technical, policy and planning advice to government in the development of the Lower Hunter Regional Strategy and the proposed Regional Conservation Plan	City Strategy Development and Environment, City Strategy

Objectives (Taken from the objectives as stated in the policy statement)	Strategies	Prioritised Actions (E = Existing projects. P = Proposed actions)	Primary Responsibility
		• E. Provide considered comment and advice to Council, through key 355 advisory committees, on state government planning processes.	NEAP, Hunter Coast and Estuary Management Committee, Flood Plain Management C'tee
	• Establish formal partnerships and with relevant agencies and NRM managers to support Council's Policy on biodiversity.	• E. Ensure key government NRM agency roles and responsibilities are identified in the NEMP & considered during project development stage.	NEMP TEAM
		• P. Identify opportunities to formalise commitments that support the delivery of biodiversity and NRM projects with external organisations including the CMA.	Biodiversity Theme Team, NRM 355 Committees
		• E. Maintain existing partnerships with the Government through the NSW Coastal Management Program and NSW Estuary Management Program.	City Strategy (Coast and Estuary Management Committee)
		• E. Support regional NRM projects through the activities of Lower Hunter and Central Coast Regional Environmental Management Strategy Steering Committee.	Development and Environment, City Strategy

PART D

Glossary of Terms

- **Biodiversity** (biological diversity) is the variety of life: the different plants, animals and micro-organisms, 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. Conservation of biodiversity is a fundamental principle of ecologically sustainable development.
- The Hunter-Central Rivers **Catchment Management Authority** is one of 13 catchment authorities established by the State Government throughout the NSW to guide and coordinate catchment management activities.
- The **Community Environmental Small Grants** program is a grant scheme where community groups and organisations can apply for funds to undertake environmental works and projects. The program is funded through the Newcastle Environmental Levy.
- **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.
- An **Ecosystem** is a dynamic complex of plant, animal, fungal and micro-organism communities and associated non living environment interacting as an ecological unit.
- An **Ecological Community** is an assemblage of plant species that occur as a common association. The Threatened Species Conservation Act 1995 identifies some ecological communities as threatened or vulnerable.
- **Habitat** is an area or place occupied by a species, population or ecological community. It may be occupied permanently, periodically or occasionally.
- A **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. Wildlife corridors are habitat corridors.
- **Habitat value** refers to the extent to which an area is capable of supporting large numbers of a variety of species.
- The State Government have prepared the **Lower Hunter Regional Strategy (draft 2006)** as a regional land use plan to guide development and population growth in the lower Hunter over the next 25 years.
- **Natural Resource Management or NRM** is a widely used term that refers to the management of natural resources including water, soil, vegetation and biodiversity.

- The **Newcastle Environment Management Plan (2003)** is Council's core environmental plan. It contains organisational processes that aim to prioritise and coordinate council activities and to monitor and review progress.
- **Population** is a group of organisms, all of the same species, occupying a particular area.
- The Commonwealth Government is signatory to a number of international treaties to protect migratory shorebirds and their habitat. The **Ramsar** Convention binds the Commonwealth Government to the wise use of significant wetland habitats.
- A **Species** is a group of organisms capable of interbreeding freely with each other but (usually) not with members of other species. A locally indigenous species is a species that occurs naturally within a local area and which has genetic material deriving from that local area. An introduced species means a species that is not locally indigenous.
- Council is required, under the provisions of the Local Government Act 1992, to prepare an annual report as to the state of the environment in the area. These reports are known as **State of the Environment Reports** or SoE reports.
- Councils can establish special advisory committees, known as **355 Committees** under Section 355 of the Local Government Act 1992. In Newcastle these include the Hunter Coast and Estuary Management Committee, the Newcastle Environmental Advisory Panel and the Guraki committee.
- **Threatened species** is a species considered to be at risk of becoming extinct, or of becoming endangered. Such species are listed in the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994*.
- **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.

Some Interesting Facts about Newcastle's Biodiversity

- About 2445 ha of terrestrial native vegetation remains in the Newcastle City Council area, representing around 10% of the total area (LHCCREMS 2000).
- 21 different native vegetation communities have been identified in Newcastle, ranging in size from 1ha to 2109 ha. These have been mapped on a regional scale.
- Threatened fauna species occur in Newcastle's suburbs, including the Powerful Owl, Masked Owl, Squirrel Glider and several bat species. Their long-term survival depends on the conservation of bushland habitat.
- A number of plant species, including the majestic Flooded Gum *Eucalyptus grandis located* on the margins of Hexham Swamp, are at the limit of their natural geographic distribution. Their conservation thus becomes more important.
- Newcastle's wetlands and estuarine vegetation communities are nationally and internationally important as habitat for migratory shorebirds that travel from the northern hemisphere to the southern hemisphere annually. They are protected under four international conventions the Ramsar Convention, The Bonn Convention, The Japan Australia Migratory Bird Agreement and the China Australia Migratory Bird Agreement.
- Newcastle's bushland contributes to regional habitat corridors that connect with adjacent local government areas, especially Lake Macquarie and Cessnock.
- Most remnant native vegetation is on private land, and not protected in Conservation reserves.
- There is no comprehensive text or general reference book specific to
- Newcastle or the Hunter Valley describing native plants, vegetation or bush regeneration practices.
- The Kooragang Wetlands Rehabilitation Project has planted over 90,000 rainforest and riverine forest trees on Ash Island since its initiation in 1996.
- Jesmond Reserve contains populations of Masked Owl and Squirrel Glider, which are both listed threatened species. Should the proposed extension to State Highway 23 proceed through Jesmond Bushland these populations are predicted not to survive in the long term.
- Squirrel Glider populations in the Blue Gum Hills area are under threat of local extinction from urban development.
- It is estimated that since European settlement, over 4 000 hectares of Estuarine wetlands within the Newcastle area have been filled or degraded.

- Migratory wader bird populations in the Hunter Estuary have crashed from around 16,000 in the 1970's to around 3,500 today. Some wader species that were once common visitors to the Hunter are no longer seen. (Hunter Bird Observers Club Inc 2001)
- The invasive coastal weed Bitou Bush was introduced to Australia at Stockton in ship ballast in about 1908. (Low 1999)
- A total of 682 indigenous native plant species have been recorded as occurring in the Newcastle area (Rodd & Clements 1994).
- It is estimated that 6 out of every 10 new environmental weeds in Australia are escapes from domestic gardens. (Community Biodiversity Network 2001)
- It is estimated that mangroves have expanded their extent by 31% in the Hunter River estuary since 1954. This has contributed to a reduction in habitat for migratory wading birds. (Hunter Bird Observers Club Inc 2001)
- The University of Newcastle values small native trees on its campus at $1 000 each.
- A total of 4 threatened plant species and 32 threatened fauna species (including 1amphibian, 26 birds, and 5 mammals) occur or are likely to occur within the Newcastle area (Newcastle City Council 2004).
- Of Newcastle's biodiversity habitats, only a relatively small proportion is conserved within dedicated reserves. There is only a small number of reserves or land in public ownership of sufficient size to retain the full range of natural biodiversity in the long term. These are bushland reserves at Summerhill Regional Park (160ha), Blackbutt (156ha), Jesmond/Rankin Park (142ha) and Glenrock (478ha), and wetland and estuarine reserves at Hexham and Kooragang.
- A high proportion of Newcastle's biodiversity occurs within habitat located on private land. The long-term survival of this habitat is dependent on private landowner management practices, and on planning policies applied by the Council.

List of Council conservation and biodiversity activities and projects

Strategic Plan	Program	Project	Status	Activity
Newcastle Coastline Management Plan (2003)	Coastcare	Rock Pool Ramble - Community Education	Annual program	Project focusing on biodiversity values and ecosystem function on Newcastle's rocky shores.
		Newcastle Coastline and Biodiversity Conservation Project	Current grant program expires in 2006	Supports the establishment and activities of community groups and community organisations in removing bijou bush and planting native coastal plants.
		Study into ecological values of rocky shorelines south of the Hunter	Draft 2005	Research project investigating biodiversity values and management needs of the intertidal rocky shores south of the Hunter River.
	CMP Implementation	Newcastle Coastline Vegetation Management Plan (Draft)	Draft at 2005	Map based planning and management tool to identify biodiversity values of remnant coastal vegetation and it guide management activities.
		Stockton Coastline Management Study and Plan (in progress)	Current scheduled for completion in 2006	Technical and management study into coastal erosion and management issues and needs on the coastline north of the Hunter River.

Strategic Plan	Program	Project	Status	Activity
Hunter Estuary Management Program	Coastcare	Stockton Sand Spit Bitou Control	Current	Project collaborates with Hunter Bird Observers Club targeting removal of bitou and replanting of native species.
	Hunter Estuary Management Study and Plan	Planning – Hunter Estuary	Scheduled for completion 2006	Collaborative estuarine management study and plan to guide future NRM planning and management
Urban Stormwater	Creeks Alive	Various sites in Ironbark Creek Catchment	Commenced 2005	Community facilitation project supporting community on-ground action within the Riparian zone
	Creeks Alive	Water Bugs Survey	Commenced 2003 - ongoing	The Water Bug survey provides a biological indicator of creek health at various sites throughout Newcastle. It is an important educational program
City Greening Program	Trees for Biodiversity	Various Sites	Commenced 2003 - ongoing	Provides plantings of native trees in parks to support biodiversity and build skills
	Natural Areas Condition Assessment	Bushland Parks	Commenced 2005	Aims to assess and map the conservation status and condition of bushland parks
	Natural Resource Data Management System	Natural Resources I.T	Commenced 2005	Work on collection of data and arrangement of maps has commenced.
Community Greening Centre	Community Greening Program	Adopt A Park Bushcare Creekcare Coastcare Community gardens Dunecare	Annual Program Commenced 1993	Supports community based environmental projects through coordination of on-ground works

List of Threatened Species and Ecological Communities

Specie	Common Name	Scientific Name	Status
Plant			
Myrtaceae	Brush Cherry	Syzygium paniculatum	V
Orchidaceae	Donkey Orchid	Diuris praecox	V
Pultanea	*Not identified*	Pultenaea maritima de Kok	V
Rutidosis	Heath Wrinklewort	Rutidosis heterogama	v
Tremandraceae	Black-eyed Susan	Tetratheca juncea	V
Zannichelliaceae	Zannichellia	Zannichellia palustris	E1
Aves			
Accipitridae	Square-tailed Kite	Lophoictinia isura	V
	Osprey	Pandion haliaetus	V
Anatidae	Blue-billed Duck	Oxyura australis	V
	Freckled Duck	Stictonetta naevosa	V
Anseranatidae	Magpie Goose	Anseranas semipalmata	V
Ardeidae	Australasian Bittern	Botaurus poiciloptilus	V
	Black Bittern	Ixobrychus flavicollis	V
Burhinidae	Bush Stone-curlew	Burhinus grallarius	E
Charadriidae	Greater Sand Plover	Charadrius leschenaultii	V
	Lesser Sand Plover	Charadrius mongolus	V
Ciconiidae	Black-necked Stork	Ephippiorhynchus asiaticus	E
Columbidae	Wompoo Fruit-Dove	Ptilinopus magnificus	V
	Rose-crowned Fruit-Dove	Ptilinopus regina	V
	Superb Fruit-Dove	Ptilinopus superbus	V
Haematopodidae	Sooty Oystercatcher	Haematopus fuliginosus	V
	Pied Oystercatcher	Haematopus longirostris	V
Laridae	Little Tern	Sterna albifrons	E
Meliphagidae	Black-chinned Honeyeater (eastern subsp.)	Melithreptus gularis gularis	V
	Regent Honeyeater	Xanthomyza phrygia	E
Psittacidae	Swift Parrot	Lathamus discolor	E
	Turquoise Parrot	Neophema pulchella	V

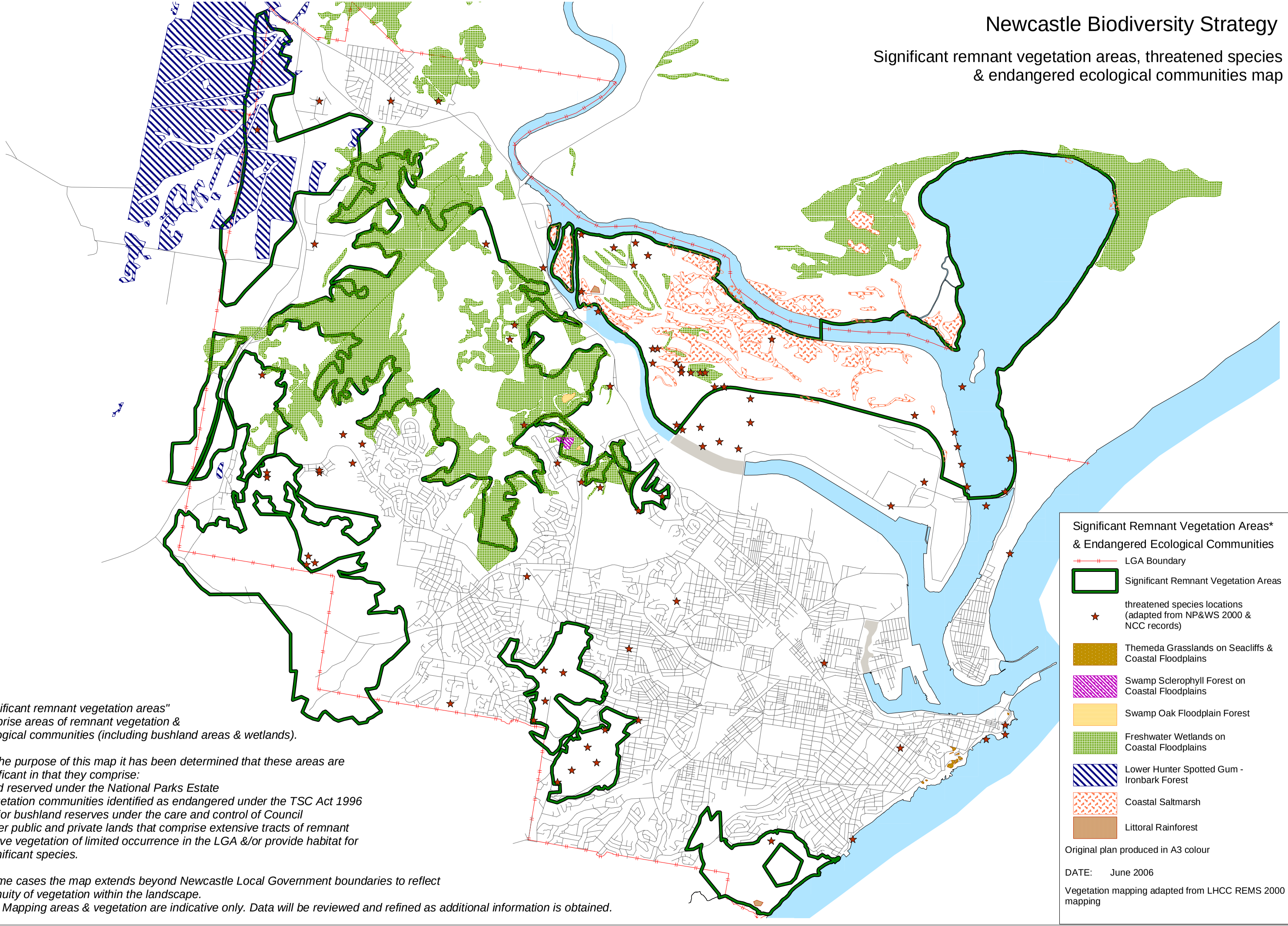
Specie	Common Name	Scientific Name	Status
Rostraulidae	Painted Snipe (Australian Subspecies)	Rostratula benghalensis australis	E
Scolopacidae	Greater Knot	Cladris tenuirostris	V
	Broad-billed Sandpiper	Limicola falcinellus	V
	Black-tailed Godwit	Limosa limosa	V
	Terek Sandpiper	Xenus cinereus	V
Strigidea	Powerful Owl	Ninox strenua	V
Tytonidae	Grass Owl	Tyto capensis	V
Tytonidae	Masked Owl	Tyto novaehollandiae	V
Amphibia			
Hylidae	Green and Golden Bell Frog	Litoria aurea	E
Mammalia			
Balaenopteridae	Humpback Whale	Megaptera novaengliae	V
Emballonuridae	Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	V
Molossidae	Eastern Freetail bat	Mormopterus norfolkenisis	V
Petauridae	Squirrel Glider	Petaurus nofolcensis	V
Phascolarctidae	Koala	Phascoloarctos cinereus	V
Pteropodidae	Grey-headed Flying-fox	Pteropus poliocephalus	V
Vespertilionidae	Little Bent-wing bat	Miniopterus australis	V
	Eastern Bent-wing bat	Miniopterus schreibersii oceanensis	V
	Large-footed Myotis	Myotis adversus	V
	Greater Broad-nosed Bat	Scoteanax rueppellii	V
Ecological Communities			
Coastal Saltmarsh			
Themeda Grasslands on Sea cliffs And Coastal Headlands			
Freshwater Wetlands On Coastal Floodplains			
Littoral Rainforest			
Swamp Sclerophyll Forest On Coastal Floodplains			
Swamp Oak Floodplain Forest			

Key

The status column denotes the classification of species as Vulnerable **(V)** or Endangered **(E)** under the NSW Threatened Species Conservation Act 1995 and or the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999. **Ecological Communities** are defined under the Threatened Species Conservation Act.

Newcastle Biodiversity Strategy

Significant remnant vegetation areas, threatened species & endangered ecological communities map



* *"Significant remnant vegetation areas" comprise areas of remnant vegetation & ecological communities (including bushland areas & wetlands).*

For the purpose of this map it has been determined that these areas are significant in that they comprise:
- *land reserved under the National Parks Estate*
- *vegetation communities identified as endangered under the TSC Act 1996*
- *major bushland reserves under the care and control of Council*
- *other public and private lands that comprise extensive tracts of remnant native vegetation of limited occurrence in the LGA &/or provide habitat for significant species.*

In some cases the map extends beyond Newcastle Local Government boundaries to reflect continuity of vegetation within the landscape.
Note: Mapping areas & vegetation are indicative only. Data will be reviewed and refined as additional information is obtained.