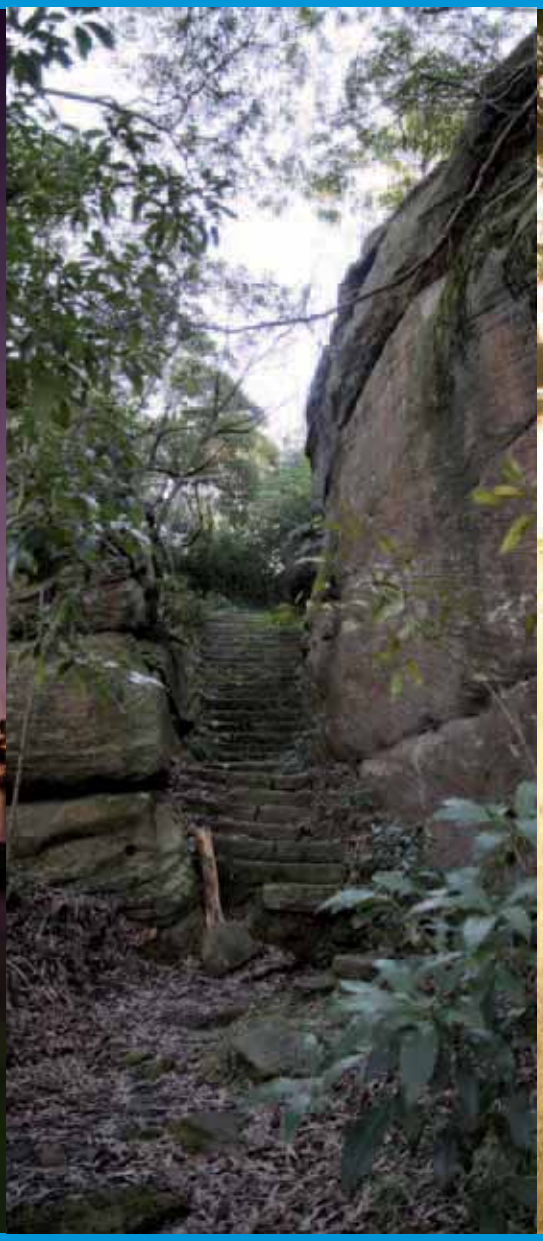

NORTHERN SYDNEY REGIONAL ORGANISATION OF COUNCILS

STATE OF THE ENVIRONMENT REPORT 2009/2010

Supplement to the
NSROC State of the Environment Report
2008/2009

Northern Sydney Regional Organisation of Councils
nsroc

NORTHERN SYDNEY REGIONAL ORGANISATION OF COUNCILS

Comprising the Councils of
Hornsby, Hunter's Hill, Ku-ring-gai, Lane Cove,
North Sydney, Ryde and Willoughby

nsroc
Northern Sydney Regional Organisation of Councils

PRESIDENT'S MESSAGE

Welcome to the 2009/2010 NSROC Regional State of the Environment Report – Supplement. This Report provides updates on key data and highlights through case studies, the relevant regional and council initiatives relating to the environment in the 2009/2010 financial year. It should be read in conjunction to the more substantive comprehensive 2008/2009 NSROC Regional State of the Environment Report.

Environmental management is a continuous and incremental process for councils. While councils' efforts are ongoing and responsive as our knowledge of environmental issues develop, some environmental outcomes may only become evident after long periods of time.

NSROC has now produced Regional State of the Environment reports for six years. This reflects both the recognition that many environmental issues impact beyond council borders and that our member councils are committed to cooperative approaches to achieve improved environmental outcomes.

This year's Report also provides a preliminary cross check of environmental performance against the NSROC Regional Sustainability Plan, which sets general environmental goals for over five years from 2009 to 2014.

At this early stage I am pleased to say the NSROC region appears to be meeting many of these sustainability goals, particularly those most influenced by direct council action. Other goals that are influenced by broader factors and other levels of government remain a key focus for our councils and the community into the future.

Nick Berman
Mayor of Hornsby Shire Council
President of NSROC
November 2010

HORNSBY
Mayor Berman

Councillor Delegate
Robert Browne

HUNTER'S HILL
Mayor Hoopmann

Councillor Delegate
Richard Quinn

KU-RING-GAI
Mayor Cross

Councillor Delegate
Steve Holland

LANE COVE
Mayor Gaffrey

Councillor Delegate
Pam Palmer

NORTH SYDNEY
Mayor McCaffery

Councillor Delegate
Zoe Baker

RYDE
Mayor Butterworth

Councillor Delegate
Sarkis Yedellian

WILLOUGHBY
Mayor Reilly

Councillor Delegate
Terry Fogarty

CONTENTS

ACRONYMS

AGO	Australian Greenhouse Office
CBD	Central Business District
CCP	Cities for Climate Protection
CMP	Conservation Management Plan
CRR	Catchment Remediation Rate
CSIP	Community Sustainability Indicators Project
DCP	Development Control Plan
DECCW	Department of Environment, Climate Change and Water (formerly the Department of Environment and Climate Change DECC incorporating former agencies known as NSW EPA, see below)
DLG	NSW Department of Local Government, now the Division of Local Government within the NSW Premier's Department
DOP	Department of Planning (formerly known as Department of Infrastructure, Planning and Natural Resources and Planning NSW)
EPC	Energy Performance Contract
ELR	Employment Lands Review
EMP	Estuary Management Plan
ESD	Ecologically Sustainable Development
ICLEI	International Council for Local Environmental Initiatives
KPI	Key Performance Indicator
LEP	Local Environment Plan
LTP	Local Transport Plan
LGA	Local Government Area
NHRMC	National Health and Medical Research Council
NPWS	NSW National Parks & Wildlife Service
NSESD	National Strategy for Ecologically Sustainable Development.
NSW EPA	New South Wales Environment Protection Authority (now DECCW)
NSROC	Northern Sydney Regional Organisation of Councils (Hunter's Hill, Hornsby Shire, Ku-ring-gai, Lane Cove, North Sydney, City of Ryde, Willoughby City)
RFS	Rural Fire Service
SHOROC	Shore Regional Organisation of Councils
SMCMA	Sydney Metropolitan Catchment Management Authority
SoE	State of the Environment Report
SMP	Stormwater Management Plan
TCM	Total Catchment Management

KEY FINDINGS OF SUPPLEMENTARY REPORT

- Expenditure on environmental activities and related initiatives has risen across NSROC member councils by $15 million in the last year to a total of $180 million.
- There has been some early indication of progress against the NSROC Regional Sustainability Plan 2009/2014, particularly in the areas of public education and awareness and energy and water consumption trends. However performance relating to the urban environment such as increasing open space and ensuring the increased provision of public transport are less encouraging.
- Councils are continuing to find great community demand for action on sustainability and uptake in environmental initiatives. These initiatives focus on both residents and business activity. Councils have also commenced various joint environmental programs reflecting best value and recognising common needs for services and information across the region.
- The population continues to grow in the NSROC region (as projected by census data) and councils continue to calibrate their planning arrangements to meet State Government required dwelling and employment targets. However built development across the region, as measured by the number of lodged development applications, was lower than the previous year by approximately 1,000 (falling from 6,425 in 2008/2009 to 5,362 in 2009/2010). This drop in Development Applications is likely to be linked to the financial crisis in late 2009. Longer term, the region's development is expected to increase and this places further challenges on the environment.
- Further work has been done over the last year on collating information on Aboriginal heritage in the region which provides an important source of information for residents and future generations. With changes to NSW planning laws, member councils are continuing to face challenges in preserving non-Aboriginal heritage as outlined in case studies in this report.
- NSROC and member councils focused considerable effort this year in assessment of transport and planning issues in the region. In response to the State Government's Metropolitan Strategy and Transport Plan, NSROC councils identified their key transport priorities. In doing so the critical emphasis has been on sustainable public transport which maximises environmental, social and economic outcomes for the region.

- Waste is an important environmental challenge for the NSROC region, particularly in its densely populated areas. In the last year the total amount of residential waste generated in the region declined. Unfortunately the portion of waste which has been recycled has fallen slightly compared with 2008/2009. This outcome reflects difficulties with current recycling operators and their limited capacity to take the increased total recyclable materials being generated across Sydney.

- Noise concerns across the region remain relatively unchanged against the previous year. However new information is now being published about aircraft noise which will continue to be monitored by NSROC member councils given the growth in aircraft traffic expected as Sydney expands.

- Energy consumption across the region is a key concern and a substantial level of council action is focused on reduction of energy use in our communities. In 2009/10 the average energy use in businesses has increased slightly (up by 0.6%). But there has been a substantial decline in average residential energy use across the region (down by 3%). Councils continue to look for ways to reduce the energy consumption of their own assets and activities. However some difficulties are anticipated in the future with substantial increases in fixed costs and essential obligations such as street lighting.

- In 2009/2010 water consumption across the region has increased by around 1million kilolitres or around 2%, which is half as much as the increase of the previous reporting period. This consumption rate is reasonably stable taking into consideration that the region has had at least 1000 new dwellings created in 2009/2010.

- NSROC member councils and their residents are passionate about their bushland and this is again reflected in growing volunteer numbers across the region. In the International Year of Biodiversity, NSROC councils commenced many initiatives which are noted in case studies. While the value and diversity of wildlife in the NSROC region is well recognised today, over such a long period of urbanisation the region does have certain species of flora and fauna under pressure.

- Water quality is measured in the SoE report through a variety of methodologies including “healthy bug counts” and pollution levels in beaches. Improvements in stream, beach and water quality are incremental and little can be seen to have changed in measures since 2008/2009. NSROC councils continue to take direct action through investment in stormwater management including installation of gross pollutant traps. In 2009/2010 NSROC councils collected less tonnage from more pollutant traps than the previous year. This outcome may be due to a variety of factors including less rainfall but it may also be linked to less ground litter and dumping in our waterways.

- Councils across the region continue to take action to lower their CO_2 emissions. An additional 4,000 tonnes of CO_2 have been saved across all council sites compared with 2008/2009. However councils do need to continue to be vigilant on their major asset emissions and look at further CO_2 emission saving opportunities. Councils emissions across sites vary considerably from year to year as new sites come on line and changes in methodologies for CO_2 measurement are adopted in line with changes to state and federal guidelines.

- In terms of future initiatives NSROC member councils will be looking at implications of climate change and building on spacial mapping of impacts of climate change events such as sea level rise, storm surges and estuary inundation. Councils require this information to better plan and optimally manage infrastructure assets and the community’s natural environment.

Introduction

THE NSROC REGION

The Northern Sydney Regional Organisation of Councils (NSROC) covers a diverse area of more than 600 square kilometres and is home to more than 500,000 people. It includes the local government areas of North Sydney, Lane Cove, Willoughby City, Ku-ring-gai, Hornsby Shire, City of Ryde and Hunter's Hill. All are collectively represented by NSROC.

The region is home to a variety of landscapes and communities. These range from scenic waterways, bushland parks and areas of historical significance, through to residential high-rise living, and thriving commercial and retail centres. Such a large and disparate region provides many challenges to effective environmental management.

Community, residential and tourist surveys regularly indicate that a major attraction of the NSROC area is its environmental attributes. These are commonly identified as an abundance of open space, mature and substantial urban treescapes, the proximity to national parks and bushland reserves, lack of pollution, and the prevalence of natural water bodies and waterways.

In part, these environmental attributes have made this area of Sydney a popular place to live. It has resulted in steady and significant population growth in recent years. Although most growth has occurred in already developed residential areas or within prescribed commercial and industrial centres, the growth in population, coupled with the ongoing accumulative environmental impacts of more than 500,000 people, has had inevitable environmental consequences.

Recognising these pressures NSROC has again produced a regional State of the Environment (SoE) report so that appropriate responses and understanding can be developed at a regional, catchment and community level.

STATE OF ENVIRONMENT (SOE) REPORTING

An SoE report is one of the corporate reporting responsibilities of NSW local government under the *Local Government Act 1993*. It is intended to provide the community with a report as to what condition the environment is in, why it got that way and what is being done to address the issues. Historically the legislation has required that the SoE report:

- Address the eight environmental sectors of land, air, water, biodiversity, waste, noise, and Aboriginal and non-Aboriginal heritage;
- Provide, as a basis of comparison in subsequent reports, a statement outlining the condition of each environmental sector at the date of the report and make the relevant comparison with the equivalent statement in the last SoE report;
- Report on all major environmental effects and related activities, including management plans relating to the environment; special council projects relating to the environment; and the environmental effects of council's activities;
- Councils are required to prepare comprehensive reports every four years, with a supplementary report in each intervening year.

WHY A REGIONAL SOE REPORT?

The value of a regional report is that it enables the community and NSROC to have a greater understanding of the status, pressures and responses to the environment within a regional context. Working together regionally has already yielded benefits including the sharing of ideas on sustainability reporting, the swapping of environmental practices and innovation in the region, and the forging of stronger regional links.

By working together the NSROC councils have also looked at a consistent regional reporting framework and a set of common indicators appropriate for reporting across local government boundaries. This has proved a significant challenge but a valuable process. While all councils are required to report against key identified environmental issues according to the legislation, each has chosen its own way of interpreting these reporting requirements. They have also gathered data through different methodologies and emphasised different issues according to what is affecting the environment at a local level.

THE FUTURE

The future of local-level environmental reporting in the NSROC region is changing. The amendments to the Local Government Act introduced in October 2009 proposed a more integrated model which will no longer require a SoE report to be completed each year. Instead, it is anticipated that councils will adopt a Community Strategic Planning process which combines core elements of sustainability (economic, social, environmental and governance) into a 10-year strategic plan, a four-year management plan and yearly operational plans.

NSROC member councils are currently at various stages of the Community Strategic Reporting process. As such this report, which reflects the financial year of 2009/2010, builds upon the data reported in the previous years and each chapter has been generally constructed around the accepted standard of reporting known as the State-Pressure-Response model used by the Commonwealth and State Governments in their respective SoE reports.

NOTE: This report is a supplementary report to the comprehensive 2008/2009 NSROC State of the Environment Report. It provides updates on key data and highlights through case studies, regional and council initiatives relating to the environment in the 2009/2010 financial year. This Report should be read in conjunction with the more substantive 2008/2009 NSROC Regional State of the Environment Report.

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Towards Sustainability

Towards Sustainability

A healthy environment is necessary for a productive economy and a cohesive society. The concept of 'sustainability' reflects a broad agreement that people living today have an obligation to protect the health, diversity and productivity of the environment for the benefit of current and future generations. Unsustainable practices cannot continue indefinitely without degrading current conditions and reducing future opportunities.

SUSTAINABILITY GOALS AND MEASURES

The Bigger Picture – Sustainability across NSW

All levels of government attempt to measure outcomes in sustainability. In December 2009, the NSW Government released its NSW State of the Environment Report. This was a follow up to the 2006 NSW State of the Environment Report.

The NSW SoE Report, which is structured in a similar way as the NSROC SoE Report, highlighted the following significant environmental issues across NSW:

Table 1: 2009 NSW State of the Environment Report – Key observations	
People and the Environment	
1.	The ecological footprint of NSW has increased from 6.35 hectares per person in 1998-99 to 7.02 hectares in 2003-04. The ecological footprint of Sydney has increased from 6.67 hectares per person in 1998-99 to 7.21 hectares in 2003-04.
2.	Total NSW household consumption has increased from $161 billion in 1999-2000 to $206 billion in 2008/2009. The greatest percentage increases in expenditure were on recreation and communications as well as rent, household services and energy.
Climate Change	
3.	The annual average temperature in NSW is increasing at an accelerating rate.
4.	Global sea level rise has accelerated over the past century. NSW has adopted sea level rise benchmarks of 0.4 metres by 2050 and 0.9 metres by 2100.
5.	NSW greenhouse gas emissions have remained relatively steady since 1990 with per capita emissions declining by 15% since then to 23.6 tonnes which is below the national average.
6.	Extreme weather events such as heatwaves and droughts are projected to be come more frequent. Storm events, combined with sea level rises, will exacerbate coastal inundation and erosion. Frequency of high or extreme fire risk is projected to increase by 10-15% by 2050.
7.	Negative impacts on biodiversity are anticipated with changes to fire frequency, saline intrusion in coastal areas and diminishment of alpine regions.
Human Settlement	
8.	NSW drinking water quality is high with increased use of recycled water. Water consumption in Sydney has declined from 343 litres per capita in 2004/2005 to 306 in 2007/2008.
9.	Fossil fuels currently meet 97% of NSW energy demands. Transport continues to be the greatest user of fossil fuels. Car numbers are increasing faster than population.
10.	Energy consumption per household is falling but rising overall as households increase and manufacturing and services industries grow.
11.	Waste recycling in NSW increased from 46% in 2004/2005 to 52% in 2007/2008. Waste disposal rates per person in Sydney have remained constant in 5 years from 2003/2008 and remains below 2000 levels.
12.	Noise pollution is the third highest type of complaint call received by DECCW.
Atmosphere	
13.	NSW complies with national air quality standards for 4 of 6 major criteria air pollutants (carbon monoxide, nitrogen dioxide, sulfur dioxide and lead). However the state still faces major challenges from ozone and particle pollution.
14.	Ozone and particle pollution are most evident in Sydney. Ozone appearing as a white haze in summer months and particle pollution usually appearing with dust storms or bushfire events.
Land	
15.	Soil degradation rates in NSW are slowing with improved land management.
16.	But acidification organic carbon and soil structure decline are evident. In coastal and urban areas soil erosion and land instability problems from urban development and encroachment of expanding urban fringe areas.
17.	Generally remediation of contaminated land is increasing.
Water	
18.	Due to protracted drought conditions, many water storages in NSW are low.
19.	Both inland and some coastal river and wetland systems have suffered limited flows affecting aquatic ecosystems.
Biodiversity	
20.	Native flora and fauna in NSW remains under threat with specific declines observable in native bird distribution.

In concert with this report, the NSW State Plan, created in 2006, also reported on its 2010 Annual Performance against its "Green State" Targets. The 2010 Annual Performance Report does not specifically articulate and measure its results against all its original 2006 State Plan targets.

Table 2: NSW State Plan – 2010 Annual Performance

NSW State Plan "green state" target	Results in 2010
Increase water recycling from 15 billion litres per year to 70 billion litres by 2015. Save 145 billion litres of water per year by 2015 representing almost 25% reduction from Sydney's projected demand	In 2008/2009 the volume of Sydney recycled water increase to over 27 billion and is forecast to rise to 58 billion in 2010/2011. In 2009 Sydney saved over 76 billion litres of water per year, half way to the target of 145 billion litres by 2015.
Achieve 20% renewable energy consumption by 2020	In 2008 5.9% of energy consumed in NSW was from renewable energy sources. Renewable energy generation from solar and wind power has increased threefold in the last six years.
Cut greenhouse emissions by 60% by 2050	NSW GG emissions in 2007 were 6.2% higher than the emissions in 2000 (State Plan target base year). Stationary energy sector continues to be most significant source of GG increased by 2% from 2006 to 2007. Land use, land change use and forestry accounted for largest decline in GG emission by 3% from 2006 to 2007.
Improve biodiversity and native vegetation and soil condition.	Negative trends for threatened species and invasive species but stable in meeting for area targets for enhancement and rehabilitation.
Air quality	On trend with the exception of ozone and particle pollution as noted in NSW State of the Environment Report.
Meet waste reduction targets	Waste recycling per capita has increased from 2000 levels.

NSROC Regional Action and Results

In the context of these state-wide environmental trends, in 2009/2010 NSROC councils continued to invest in environmental action. One indicator of this commitment is the continued expenditure associated with environmental activities as noted in Table 3 and Figure 1.

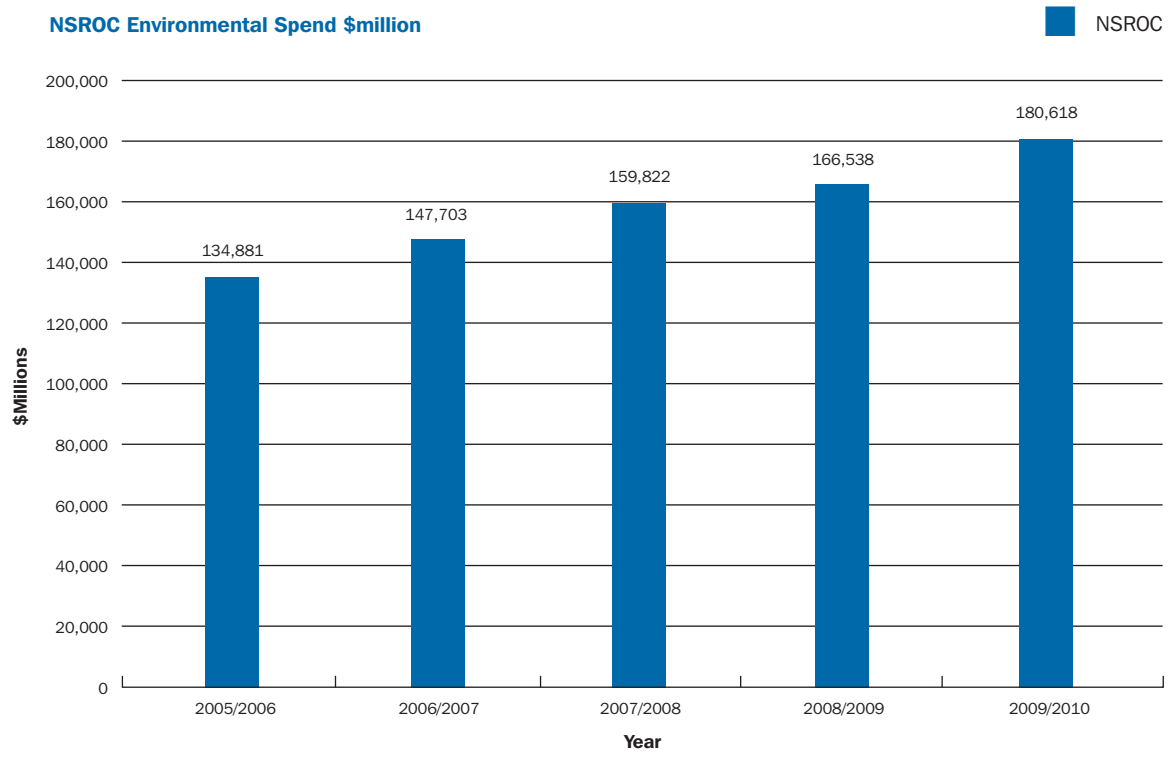
Table 3: Total Expenditure on Environment by council 2009/2010

NSROC council	Expenditure 2009/2010	Expenditure 2008/2009 ($)	Population of LGA (estimate for 2008/2009)	Area of LGA (square kilometres)
Hornsby	$44,772,534	$45,801,561	159,211	509
Hunter's Hill	$2,700, 000	$2,855,000	14,092	6
Ku-ring-gai	$20,303,854	$20,303,854	108,135	84
Lane Cove	$8,316,143	$8,943 596	31,638	10
North Sydney	$27,512,594	$26,459,471	62,668	10
Ryde	$45,359 729	$42,772,732	103,597	40
Willoughby	$31,653,474	$28,345,039	68,008	23
NSROC Total	**$180,618,328**	**$166,537,657**	**547,349**	**628**

It should be noted that expenditure on the "Environment" in the Figures above embraces a broad set of activities including core amenity costs such as facility and park maintenance, sustainable planning processes and specific environmental programs and initiatives. There are also variations in the definitions and classification of "environmental expenditure" used by each NSROC councils.

Over the last five years the environmental spend across the region has increased which reflects the recognition of the importance of the environment and sustainability emphasis in councils' activities.

Figure 1: Total NSROC Regional Environmental Spend 2005/2006 to 2009/2010



Another indicator of the NSROC region's commitment to improving environmental outcomes is the "on trend" improvements in the region consistent with the goals set in the NSROC Regional Sustainability Plan.

The NSROC Regional Sustainability Plan, endorsed by NSROC in early 2009, sets out broad environmental directions. A desktop analysis, looking at the last 6 years of NSROC Regional SoE reporting, shows that many of these goals are being achieved, particularly those most directly influenced by direct council action. Other goals that are influenced by broader factors and other levels of government remain a key focus for our councils and the community into the future.

Table 4: NSROC Regional Sustainability Plan 2009/2014 targets

Issues	Goals	Trend	SoE Reference
1. Climate Change and Energy Consumption	**Reduce energy consumption** 1. Reduce non-renewable energy use **Reduce GHG emissions** 2. Reduce emissions by councils 3. Reduce emissions by the community **Adapt to climate change** 4. Plan to adapt to climate change	**Improving** **Improving** **Improving**	**Chapters 2 and 5**
2. Development and Built Environment	**Manage development sustainably** 1. Avoid overdevelopment 2. Minimise impacts of medium / high density housing on infrastructure and the community 3. Maintain and increase open space **Increase sustainable building** 4. Adopt and champion sustainable building practices for both new buildings and retrofits **Provide adequate infrastructure** 5. Ensure adequate infrastructure overall	**Unknown** **Improving** **Deteriorating**	**Chapter 2**
3. Water and Sewerage	**Save water** 1. Increase recycling by Councils and businesses 2. Increase on-site and household water capture and storage 3. Increase use of grey water 4. Increase sewer mining 5. Support water sensitive urban design (WSUD) **Improve water quality and health** 6. Improve water quality 7. Improve public health and reduce damage to waterways	**Improving** **Stabilising**	**Chapter 2 and 4**
4. Sustainable Businesses	**Help businesses be more sustainable** 1. Educate businesses 2. Save water in businesses 3. Businesses to prepare and implement sustainability plans **Recognise and encourage business sustainability** 4. Implement Region-wide sustainability business ratings scheme	**Improving** **Improving**	**Chapter 1**
5. Biodiversity Conservation and Protection	**Improve terrestrial and aquatic biodiversity** 1. Improve the ecological integrity of native bushland and aquatic habitats 2. Protect undeveloped rural and urban land and habitats 3. Consolidate and/or expand canopy cover and native floral diversity 4. Improve the health of our rivers and creeks **Demonstrate improvement** 5. Generate ways to assess and monitor biodiversity	**Stabilising** **Improving**	**Chapter 3**
6. Resource Recovery and Waste Avoidance	**Reduce waste** 1. Reduce solid waste – move towards exporting near-zero waste from the Region 2. Reduce green/organics waste	**Improving**	**Chapter 2**
7. Transport and Traffic	**Improve sustainable transport options** 1. Greater use of public transport to reduce use of private cars 2. Increase healthy methods of travel (e.g. walking and cycling for local commuting) to reduce car use and improve community health 3. Maximise job retention and working from home to reduce car use and improve community	**Stabilising**	**Chapter 2**

Another indicator of the regions collective action is the number of NSROC councils that are engageing in cross council environmental initiatives and programs – two new programs in 2009/2010 are Green Style and Better Business/ Sustainable Business Partnerships.

CASE STUDY

HORNSBY, KU-RING-GAI AND WILLOUGHBY CITY COUNCILS – The Greenstyle Program

Greenstyle is a joint Council project between Hornsby, Kuring-gai and Willoughby City Councils with assistance from the New South Wales Government through its Environmental Trust. The aim of the project is to increase biodiversity on private property and assist residents to live more sustainably in their homes. The target audience is the time poor 25-55 year age group and in particular those residents who live adjacent to bushland and riparian areas. To date 56% of participants have been in this age group and importantly 66% of all participants in the program indicated they have not previously been involved in a council program.

Some features of the program include:

- A one-stop-shop Greenstyle website: http://www.greenstyle.org.au which has received over 4,900 hits since launching;
- How to and environmental interest video clips on you tube, greenstylenorth;
- Free home and garden assessments that encompass energy efficiency, the latest in government rebate information, solar energy, water savings and backyard biodiversity,
- Greenstyle calendar of over 65 environmental workshop and training events across the three council areas for participants.
- An incentive program of giveaways (including native bee hives, compost bins and free plants; over 2000 already planted) to residents undertaking projects in their homes and backyards.

The program offers a unique opportunity to receive in home advice from a Council officer on a range of environmental topics for those residents that have little time and opportunity to research the answers for themselves. It provides on ground garden advice and the tools to increase biodiversity on private property.

There have been 575 participants to date and all have had a home and garden assessment with many participating in follow up visits and getting their neighbours involved.

CASE STUDY

KU-RING-GAI, NORTH SYDNEY, WILOUGHBY AND CITY OF RYDE COUNCILS – Better Business Partnership and Sustainable Businesses in Ryde

Better Business Partnership

The Better Business Partnership is run in partnership with Ku-ring-gai, North Sydney and Willoughby City Councils in order to maximise reach, build relationships and ensure effective delivery of opportunities and solutions to business. This business improvement project is assisted by the New South Wales Government through its Environmental Trust and by Sydney Water's Every Drop Counts Business Program.

Regional results from Pilot Program

- 70 businesses engaged through face to face recruitment, introductions through strata executives or chamber of commerce
- 70 Better Business Partnership overviews completed and action plans developed
- 59 businesses through to Energy Efficiency for Small Business Program, action plans developed and received, including not just lighting, but refrigeration, ventilation, HVAC and other specialized equipment
- 12 implemented retrofits with 8 more business committed to install
- Identified more than 20% CO_2-e savings per year (equating to 571 tonnes of identified CO_2-e)
- Identified more than $100,000 of savings on energy per year with an average yearly saving of $1716
- 19% financial savings identified across the group and a potential reduction of at least – 20% CO_2-e savings identified.

For more information please go to:
www.betterbusinesspartnership.com.au

Sustainable Businesses in Ryde

The Sustainable Businesses in Ryde Program has been developed to assist businesses reduce water and energy consumption and increase recycling, while remaining profitable. The program encourages businesses to reduce energy and water use and subsequently the associated costs as a sensible financial and business investment.

The program targets small to medium businesses that use between 10–80 kilolitres of water a day. There are hundreds of businesses that fit into this criteria, representing a diverse cross section of business types across the City. The Program is the first of its kind in NSW incorporating a unique alliance between Sydney Water, the Department of Environment and Climate Change and Water (DECCW) and local governments. This alliance enables Council to utilise the support of Sydney Water as well as the energy audit and waste experience of DECCW.

The 3 year program began in early 2010 and aims to reduce water use by 15% at each business, energy by 10% and increase the recycled content of waste materials to 57%. To date the program has identified water savings of over 20,000 litres per day for the participating businesses, and an average of 40% reduction in water use. The program is being expanded across the City, with more businesses being approached to participate and realise similar savings.

For more information and updates on progress go to:
http://www.ryde.nsw.gov.au/sustainablebusiness

COMMUNITY CONSULATION AND ACTION

Councils are continually speaking with and listening to their communities about the concerns of the environment. For further details of these ongoing activities see the 2008/2009 SoE Report.

In 2009/2010 some new initiatives have been undertaken including : Climate Clever Community Education Campaign by Willoughby City Council, the Ryde Sustainability Family Fun Festival and the Ku-ring-gai Small Grants Program.

CASE STUDY

WILLOUGHBY CITY COUNCIL – ClimateClever Community Education Campaign

Willoughby City Council in 2009 launched *ClimateClever*, a comprehensive climate change education campaign designed to encourage and practically assist Willoughby residents, businesses and schools to reduce their carbon footprint and to foster an organisational culture within Council as an organisation striving to be a leader for taking action on climate change.

This major campaign consists of a range of tailored programs such as *ClimateClever* Apartments and the *ClimateClever* Shop, events, practical workshops, educational materials and resources that support, inspire and empower the local community to reduce their greenhouse gas emissions. The campaign seeks to foster a vision of Willoughby City becoming a leader of sustainability by reducing the city's carbon footprint by 15% by 2015. Importantly Council strives to lead by example as demonstrated in the Council already reducing its own carbon footprint by 50%. In 2010 Willoughby City Council was awarded the Sustainable Cities Environmental Education Award for the ClimateClever campaign.

CASE STUDY

CITY OF RYDE COUNCIL – World Environment Day – Ryde Sustainability Family Fun Festival

The Ryde Sustainability Family Fun Festival was a partnership initiative that combined a series of workshops and talks on issues relating to the Parramatta and Lane Cove rivers, solar passive design, rebates, rainwater tanks, chemical free cleaning and more with children's entertainment, animal shows and guided walks.

The 'Water.Habitat.Life' themed World Environment Day event was located in Eden Gardens, Garden Centre adjacent to Lane Cove National Park. The free community groups expo that was included allowed local environmental groups to promote themselves to a wider audience.

It also included an organic BBQ and interactive displays, with a shuttle service provided by the Top Ryder Community Bus and a comprehensive environmental event audit completed at the end with all related carbon emissions being offset and waste to landfill minimised through provision of recycling (including water recycling) and composting facilities.

CASE STUDY

KU-RING-GAI COUNCIL – Small Grants Program

The small grant program provides an opportunity for the community, particularly community groups and schools, to source funds to improve the local environment. This program has built a strong link with the community where advice, guidance and financial support are supplied for on-ground works. $80,000 is available each year, with individual grants generally being less than $5,000. Projects should have sustainable, environmental and community value. The program has been hugely successful in the five years that it has been running, with over 90 small grants being awarded to community groups over ten rounds.

CORPORATE ACTION

Internally councils are also endeavoring to improve their environmental performance. Councils are strategically looking at all parts of their business and activities to make sure they are sustainable. The 2008/2009 SoE report outlines some of the ongoing actions NSROC councils have in place.

Two new initiatives in 2009/2010 are Ryde's Sustainability Assessment Protocol for Project Planning and Hornsby's Building Performance Monitoring System.

CASE STUDY

CITY OF RYDE COUNCIL – Ryde's Sustainability Assessment Protocol for Project Planning

A sustainability protocol has been developed by Council through extensive staff consultation, as a means of ensuring staff involved in project development and management understand and respond to Council's commitment to sustainability. It is a decision-making tool based on quadruple bottom line principles that facilitates project assessment with regard to the Management Plan's four key outcome areas (i.e. environment, people, governance and assets). Each key indicator in the protocol has six sub-indicators for those outcome areas in a scorecard type assessment.

The protocol has been designed to encourage staff to identify opportunities for improvement in sustainability performance and was based on numerous trials and consultations across Council departments, with the assessment tool being reworked in response. The protocol has been presented to the ICLEI World Congress in Edmonton, Canada and has been shared with various Regional Organisations of Councils such as CENTROC and the Sunshine Coast Regional Advisory Committee as well as individual councils.

CASE STUDY

HORNSBY SHIRE COUNCIL – Hornsby's Building Performance Monitoring System

Hornsby Shire Council Building Performance Monitoring System is an interactive website that is viewable from the Hornsby Shire Council Intranet. The website shows real time and historical energy, gas and water usage data for the Hornsby, Epping, Galston, Pennant Hills and Berowra library sites. Resource use is displayed in graph form which allows the user to analyse usage and identify areas of improvement. The software also incorporates fault detection algorithms which will notify the users of potential problems and identify energy saving opportunities. The presentation of information is given in a user friendly "dashboard" format as shown opposite:

2

Human Settlement

Human Settlement

The history of non-indigenous settlement in the region starts immediately after Sydney was first colonised in the late 18th century. However substantial settlement did not occur until almost 100 years later. In this period, development followed the railway lines and the main arterial roads linking Sydney city with the small settlements on its outskirts.

More recently, the NSROC area, like the rest of Sydney, has been under substantial and continual pressure to accommodate a rapidly growing population. Regional residents have been active in ensuring that the natural heritage values of the region are protected and managed sustainably in the on-going push for further urban consolidation.

The high property values in the NSROC region are partly a reflection of the region's success in retaining outstanding environmental attributes and ensuring a comprehensive integration of heritage, open space and bushland into the built environment. *(NSROC Regional Social Report, Gail Le Bransky, Sydney 2005)*

URBAN DEVELOPMENT AND GROWTH

Historically urban development in the NSROC area has been constrained in the northern and north-west by the natural topography and extant bushland preservation areas. Urban development has generally proceeded along the ridgelines, with the steeper areas adjacent to the Hawkesbury River with its tributaries remaining undeveloped except for small residential settlements and commercial hubs supporting water-based commercial activities. Although some former rural areas have been developed for residential purposes, large areas within the Hornsby Shire have remained primarily rural. The high cost of delivering urban infrastructure, and the importance of maintaining productive agricultural lands are major constraints to urban growth in these areas. In the southern part of the NSROC region there is a high level of residential and business concentration. The region has several business and commercial hubs including North Sydney, Chatswood, Ryde and Hornsby: and special business parks, education and health areas of Macquarie Park, Macquarie University and the Royal North Shore Hospital precinct.

The NSROC area, like the rest of Sydney, has been under substantial and continual pressure to accommodate a rapidly growing population. The most pressing growth pressure is expressed in the state's Metropolitan Strategy. (see Table 5). The targets in this plan challenge the NSROC region's historical growth patterns.

Table 5: Dwelling targets and employment capacity targets for the Inner North and North Sub-Regional Strategies, NSW Department of Planning, 2007

Local Government Area	Dwelling Target	Employment Capacity Target
Hunter's Hill	1,200	300
Hornsby	11,000	9,000
Lane Cove	3,900	6,500
Ku-ring-gai	10,000	4,500
North Sydney	5,500	15,000
Ryde	12,000	21,000
Willoughby	6,800	16,000
Total	**56,400**	**72,300**

The NSW Department of Planning are due to release revised population and employment targets for each council anticipated from the Metropolitan Plan Review in late 2010 or early 2011. Preliminary documents indicate that these targets will be readjusted upwards.

Land Use and Construction Rates

Land use in the NSROC region is relatively static given the extensive development in the region already. Unlike other regions NSROC has few greenfield sites to develop and therefore the opportunity to allocate new land uses. There is no variation of any significance in land use between 2008/2009 and 2009/2010.

The greatest challenges in land use management in the NSROC area is the maintenance of open space for the amenity of increased populations and the demand to convert business and industrial land into residential land.

Table 6: Percentage of land use by LGA in the NSROC region in 2009/2010

Council	Business	Industrial	National Park	Open space	Residential	Roads	Special uses	Rural	Unzoned/ Other
North Sydney	6.3	0	0	16.8	44.7	25.1	5.4	0	0
Lane Cove	1.5	6.1	0	15	51.8	19.6	5.8	0	0.30
Hunter's Hill	3	0	0	13	50	17	17	0	0
Ryde	8.5	0.8	6.3	9.3	42.2	18	14.9	0	0
Ku-ring-gai	0.6	0	19.7	16.5	43.9	12.2	3.7	0	3.40
Hornsby Shire	0.4	0.4	49.9	5.2	9.4	NA	3.3	15.7	15.7
Willoughby	2.38	4.29	0.35	20.1	49.35	18.21	4.46	0	0.86

Councils have very limited capacity and resources to create new open space as population density increases. Conversion of business land to residential is mainly occurring through mixed use developments such as combined commercial and residential medium density complexes. Urban consolidation has already taken place in existing commercial zones particularly around transport hubs.

Annual trends in development applications and new dwelling are incomplete and difficult to interpret due to the variation in scale of the developments and its approval timeframes. For example in one year a substantial high density residential development may distort trend figures.

Table 7: Number and Type of Development Applications (DAs) lodged in the NSROC area in 2009/2010

Council	Number of Commercial DAs	Number of Industrial DAs	Number of residential DAs	Number of aged persons housing DAs	Other
North Sydney	142	0	311	0	53
Lane Cove	62	8	340	1	6
Hunter's Hill	4	0	125	0	0
Ryde	214	3	637	0	21
Ku-ring-gai	40	0	745	1	122
Hornsby Shire	83	29	1151	16	365
Willoughby	268	55	519	0	41
NSROC region 2009/2010	**813**	**95**	**3,828**	**18**	**608**
NSROC region 2008/2009	961	132	4,448	37	847

As Table 7 above illustrates the total number of development applications for NSROC councils in 2009/2010 is less than that recorded in 2008/2009 across all development approval types. However looking at the longer term trends over the last 4 years, it can be seen that the share of development types across categories remains relatively static. Residential DAs represent between 65 and 75% of all DA's processed by NSROC councils with Commercial DAs making up the next largest group at between 15 and 18% of all DAs processed in the region.

Figure 2: Percentage of DA types processed by NSROC Councils 2006/2010

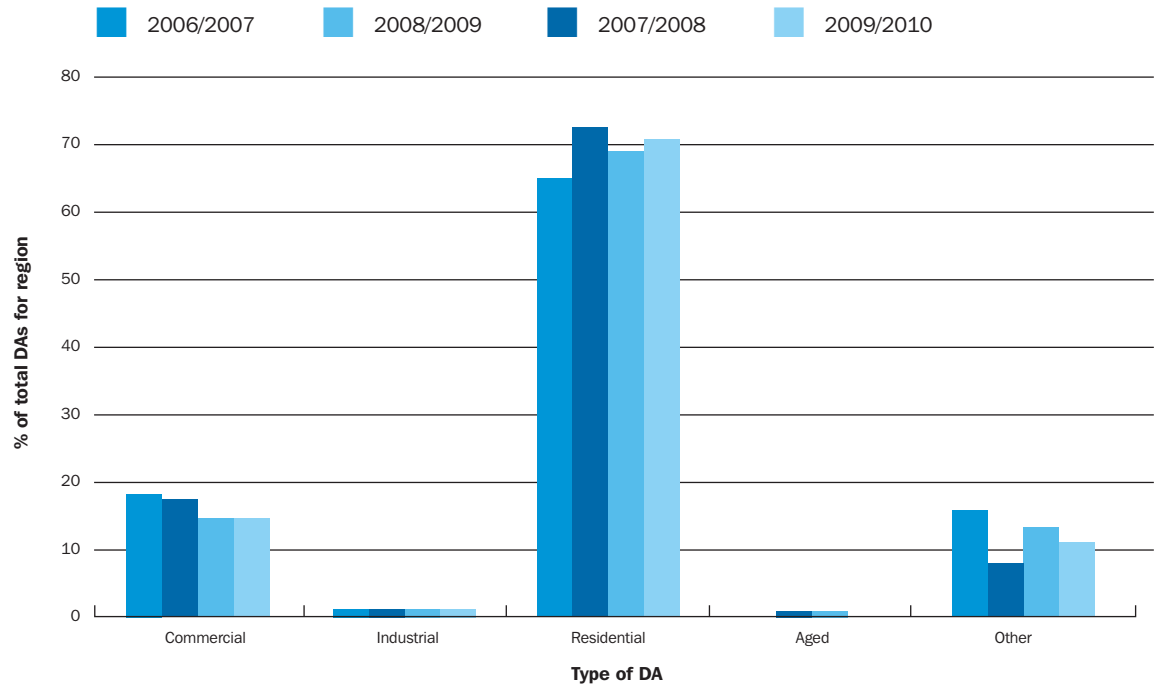


Table 8: Number of new dwellings in the NSROC region in 2009/2010 and previous years					
Council	**New dwellings 2009/2010**	**New dwellings 2008/2009**	**New dwellings 2007/2008**	**New dwellings 2006/2007**	**New dwellings 2005/2006**
North Sydney	3	6	29	20	480
Lane Cove	40	48	35	10	45
Hunter's Hill	19	27	13	16	8
Ryde	127	445	479	7	178
Ku-ring-gai	640	126	621	126	258
Hornsby Shire[1]	213	383	390	640	670
Willoughby	53	148	65	25	216
NSROC region 2009/2010	**1,095**	**1,183**	**1,632**	**844**	**1,855**

Notes

1. Dwelling numbers for Hornsby Shire are based on water connections. Some new dwellings in rural areas that are not connected to the water network are excluded from this figure.

The number of new dwellings is lower than in the previous year. The number of dwellings is substantially lower than the number of residential DA's lodged. This reflects the case that many residential DAs may relate to renovations of existing homes rather than new homes.

RESPONDING TO THE IMPACTS OF DEVELOPMENT

Given the continuing urban development in the region, NSROC councils are looking at ways to promote economically sustainable and environmentally sound design. For example the Lane Cove Library was built as a demonstration building in terms of ecologically sustainable design and co-located with a commercial shopping centre.

CASE STUDY

LANE COVE COUNCIL – Lane Cove Library & Sustainable Building Advisory Service

The new Lane Cove Library was opened in February 2010. The development incorporates a number of sustainable features including:

Natural Lighting – A high level of natural light is provided by south facing windows and a sky light located mid way along the roof.

Artificial Lighting – The most efficient electronically ballasted compact lamps and T5 tubes are used throughout.

Cooling – Sun shades are fitted to the west facing windows. Low emissivity glass is used in all windows. This works as an insulator, keeping the heat and cold out and maintaining the existing conditions inside the building. Two high efficiency air cooled chillers that provide chilled water to the heat exchangers within the air handling units in summer.

Hot water – Solar hot water panels on the roof provide hot water for toilets and kitchens.

Electricity – An 8.2 kW solar photovoltaic array generates power which is fed back into the grid. A monitor on the wall near the entrance shows the amount of power being used.

Water Conservation – The stormwater system provides recycled water for the toilets.

Sustainable Building Materials – The timber panelling and computer desks are plantation-grown tallow wood. Linoleum has been used in the staff tea room and corridors instead of sheet vinyl. Interior paint used is low in volatile organic compounds (VOCs). Carpet tiles (and adhesive used) are the most sustainable carpet product available.

As a high use public building, Lane Cove Library demonstrates to the community that ecologically sustainable design features can be incorporated into developments without compromising on comfort.

At a residential level on 2009 Lane Cove created the Sustainability Building Advisory Service. The Service was launched at the 2009 Lane Cove Village Fair and is a joint initiative of Lane Cove Council and *Archicentre*, the advisory body of the Australian Institute of Architects.

The Service offers residents an opportunity to meet an architect with specialist skills and knowledge regarding sustainable residential design. The need for such a service stemmed from the lack of personalised sustainable building advice available to residents and Council's desire to be a leader in encourageing construction of sustainable homes.

The intent of the Service was to move beyond the NSW BASIX requirements and offer more than energy and water audits offered by the Commonwealth Government through its Green Start program. As such, the Service has a strong focus on passive design, e.g. solar access, natural ventilation, building fabric etc. Influencing behavior is another key element of the Service; residents are empowered with information that enables them to use their homes in the most efficient manner.

Council targeted residents early in the design phase of potential renovations or major work to increase the opportunity to influence design. Sustainable homes need not be expensive if key sustainability features are incorporated into the design from the outset.

Bridget Kennedy of Lane Cove was the first resident to receive a consultation and has implemented some of the recommendations – "the quality of advice and the follow up report were both excellent; since the consultation I have installed a power meter which helps me monitor energy use and I have chosen sustainable timber products to use in my extensions".

In 2009 a total of 39 Sustainable Building Advisory Service consultations were conducted representing 11.5% of all residential Development Applications processed by Council.

Also setting an example at a residential level is Willoughby City Council which has created the Devonshire Street Sustainability Hub to highlight new technologies and inspire individuals to consider sustainable design in their homes.

CASE STUDY

WILLOUGHBY CITY COUNCIL – Devonshire Street Sustainability Hub

Council has recently renovated a small 1920's red brick building in the heart of Chatswood. The objective of the sustainable renovation was to develop a multi use space for council staff and commercial tenants during office hours and the community out of office hours. This maximises the use of the building, assisting to avoid the construction of a new build. This approach should prolong the life of a culturally significant building in a rapidly growing city.

This 'passive' building was designed to exist in the environment with minimal mechanical or technological assistance. This low energy foot print was achieved by opening up the structure to maximise natural air flow, lighting and winter solar heating while minimising summer heat gain. Large sections of the northern wall was taken out and replaced with double glazed, timber framed windows. Protection by eaves, honeycomb blinds, insulation and ventilation assist to control the heat gain in summer. The addition of fans and mechanical venting assists to control occupant comfort.

There was extensive reuse of building materials with the majority of bricks from the walls used to build raised beds in the edible garden. Window frames, doors and architraves were also reused.

Occupant health was a major consideration with non VOC (Volatile Organic Compounds) paint used

internally and low VOC paint used externally. Carpet tiles were chosen due to their recycled backing and low VOC properties. This carpet will be collected at the end of its life to be recycled into new carpet backing.

Additional technologies utilised were LED (Light Emitting Diode) lighting and photovoltaic panels.

POPULATION DISTRIBUTION

The size, rate of increase and settlement patterns of the NSROC population influence the environmental impacts within and outside the NSROC region. Changes in land uses for human purposes can damage natural ecosystems, and alter air and water cycles. Population growth is also associated with a range of other issues, such as energy consumption, transport and waste management.

The impacts of population growth vary according to the patterns of human settlement and the sensitivity of the different receiving environments exposed to them. Settlement may:

- Threaten the survival of highly valued plant or animal species
- Degrade the quality of the water or air vital for the safe and sustained survival of all life in the region
- Result in an increase in intrusive noise
- Impact on the aesthetic appeal of the area.

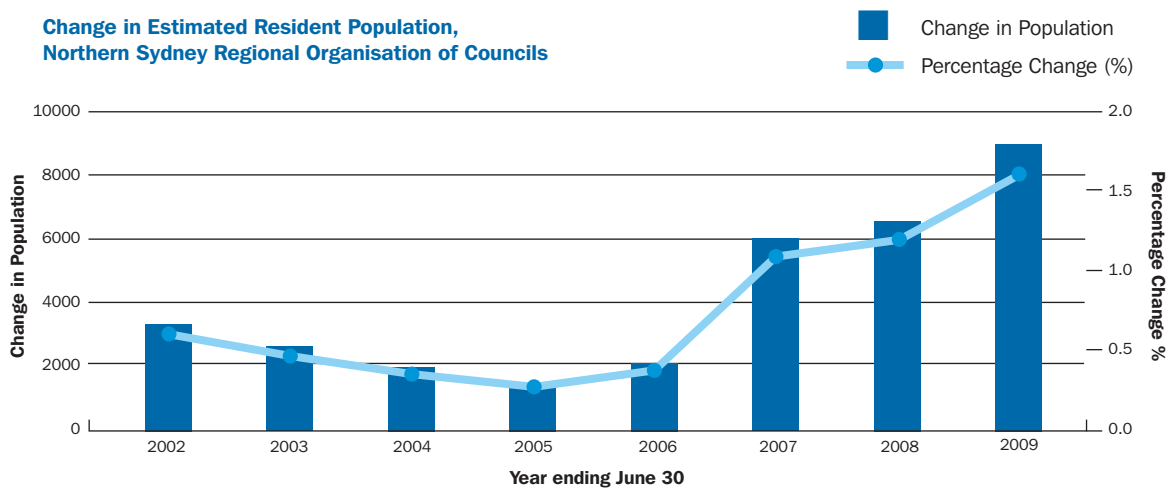
Below are estimates of the population of the NSROC region based on figures provided by the Australian Bureau of Statistics (ABS). Although the region has experienced significant growth in the past decade, the data illustrates that the rate of population growth is slowing. The 2001 to 2006 ABS data indicated a pronounced dip in population growth. However, estimates suggested a slight rise and increase in population in 2007, 2008 and 2009.

Population Data for the Region

Below are estimates based on the most recent census in 2006 of the population of the NSROC region based on figures provided by the Australian Bureau of Statistics (ABS). Although the region has experienced significant growth in the past decade, the data illustrates that population growth is slowing. This may be as a result of the overall decline in the housing market in Sydney which has resulted in fewer new homes being constructed. It may also be influenced by the region's changing demographics, with high property prices meaning fewer families moving in, and thus household size (and hence total population growth) is decreasing.

The 2001 to 2006 ABS data indicated a pronounced dip in population growth. However, estimates suggested a slight rise and increase in population in 2007 and 2008 as shown in Figure 3.

Figure 3: Change in NSROC Resident Population 2002/2009

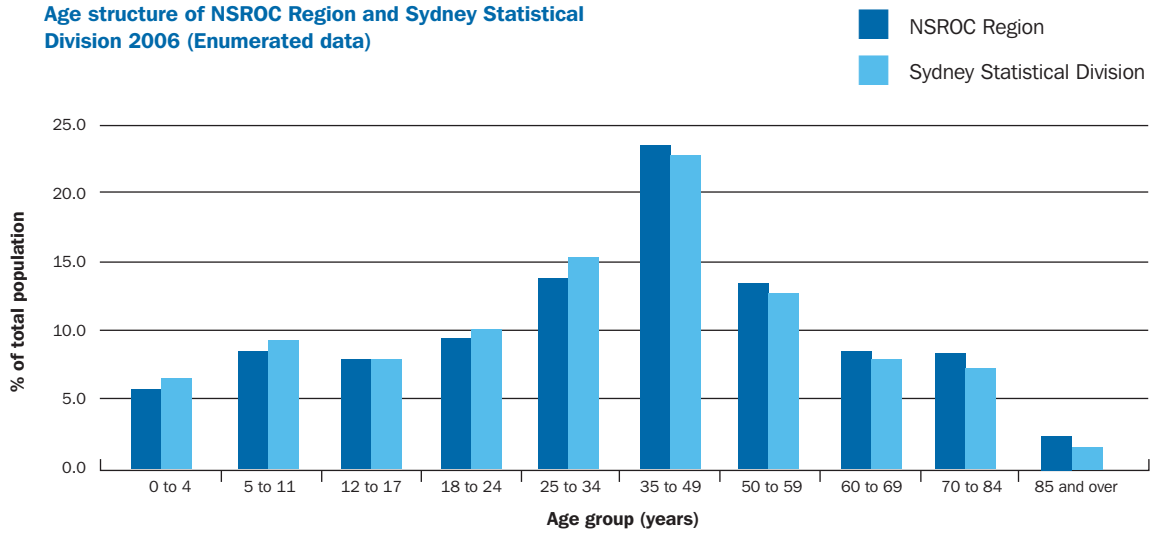


Source: Australian Bureau of Statistics. 3235.0 – Population by Age and Sex, Regions of Australia. 2007

Age demographics of the region are based on the 2006 census and will need to be revised in the 2011 census. However it is anticipated that the NSROC region will continue to have a large group of residents aged 35 and above as its predominant population (see Table 10 in 2008/2009 SoE report).

NSROC region also has higher ageing population groups when compared to the rest of Sydney as illustrated below.

Figure 4: NSROC Region Age Structure relative to Sydney average



Source: Australian Bureau of Statistics. 2006 Census of Population and Housing (Emunerated)

The impacts of an ageing population on the environment are not significantly different to any other population group in terms of specific environmental pressures. A potential benefit provided by the ageing population is the possibility of more active community engagement in environmental initiatives. Older populations are significant participants in volunteering and this is vital to many environmental initiatives such as Bushcare and wildlife monitoring in the region.

HERITAGE

Aboriginal Heritage – Aboriginal Site Management and Monitoring

Aboriginal heritage and site monitoring is a joint responsibility of councils and the Aboriginal Heritage Office (AHO). The Aboriginal Heritage Office is a joint initiative of Ku-ring-gai, Lane Cove, Manly, North Sydney, Pittwater, Warringah, Willoughby and City of Ryde Councils and is supported by the Heritage Branch of the NSW Department of Planning and the Commonwealth Department of Environment, Water, Heritage and the Arts. Armidale Dumaresq Council joined the partnership in August 2008 and finished its special projects agreement in March 2010. City of Ryde Council joined the partnership in March 2010 at the 10 year anniversary of the AHO.

The Aboriginal Heritage Office works to ensure the protection of Aboriginal sites and cultural heritage. In 2009/2010, the Aboriginal Heritage Office continued to coordinate training for Council staff, primarily those involved in the development of assessment processes but also outdoor staff; outlined the policies and legislation relating to Aboriginal heritage, including meeting with NSW Department of Planning and Department of Environment, Climate Change, and Water staff about changes to legislation; and conducted a large number of Guided Walks, Schools and Aboriginal Sites Awareness events at various locations within the region.

As part of regular monitoring and reviews and in response to reports from Council staff and the public 12 new sites were identified in the area. There has been site protection works at a number of locations and the continued revision of the site management plan (see below).

Table 9: Identified Aboriginal Sites (from AHO)

Council	Total sites	New sites	Protection works done-in progress
Ku-ring-gai	97	2	1
Lane Cove	90	1	1
North Sydney	75	1	4
Ryde	56**	5	0*
Willoughby	159	6	3

Hunter's Hill and Hornsby data not avaliable.
**The City of Ryde joined the Aboriginal Heritage Office in March 2010 therefore protection works are yet to commence. The current figures are not comparable to previous years and are being continually updated. An AHO Site Management Report for the City of Ryde is due to be finalised in January 2011.*
***'Registered Aboriginal Sites' includes existing aboriginal sites identified by the AHO within the City of Ryde LGA but excludes sites in National Parks.*
Note: 'New site' includes some previously registered sites held by DECCW but that had been incorrectly mapped outside the Council boundary by the original recorder or DECCW.

An important part of the role of the Aboriginal Heritage office is to enhance appreciation of Aboriginal heritage in the wider community. The new Aboriginal Heritage Office Education Centre and Keeping Place in Northbridge has continued to expand in its exhibits and scope. Numerous resources are available for free download from the AHO website www.aboriginalheritage.org.

The AHO received funding for a continuation of its volunteer monitoring program through the Indigenous Heritage Program (DEWHA). More volunteers were trained in basic Aboriginal heritage site awareness and an expanded network of Site Care volunteers was established throughout the partner councils to provide regular monitoring and care of specific Aboriginal sites. The project ran over 2009/2010 and has allowed the AHO to build a sustainable program that can continue into the future.

Rock Art Recording Project

The AHO received funding for a rock art recording project from the Indigenous Heritage Program (DEWHA). The original recordings held by DECCW were made by a variety of people at varying levels of detail and accuracy. This project sought to provide a consistent and measurable set of data for an accurate base record and to assist in future monitoring and conservation works. The project ran over 2009/2010. A total of 43 Aboriginal rock art sites were fully recorded to provide a permanent record of the irreplaceable but fragile art of the region. The data will allow the AHO and councils to continue the process of prioritising key locations for conservation works, monitoring and signage.

Table 10: Status of art sites for each Council area (AHO data)				
Site Features	**Ku-ring-gai**	**Lane Cove**	**North Sydney**	**Willoughby**
Accessible	7	6	12	7
Private land	4	5	0	2
Destroyed	0	1	1	2
Duplicate / not council	2	2	0	1
Not located	2	0	0	0
Art not visible	0	2	1	1
Total sites	**15**	**15**	**14**	**13**

(Rock Art Recording Project 2010, AHO)
This listing is not comprehensive as some councils may not have publically identified their sites at the request of Aboriginal elders.

NON-ABORIGINAL HERITAGE

Councils have ongoing commitment to preserving local heritage sites. However there are times where councils' best efforts in heritage preservation have not been successful. Some 2009/2010 heritage preservation initiatives of North Sydney and Ku-ring-gai Councils noted below illustrate this point.

CASE STUDY

NORTH SYDNEY COUNCIL – Heritage Projects

Graythwaite

Despite more than 10 years of lobbying, offers and Supreme court proceedings, Graythwaite Estate was sold by tender in 2009 to the Church of England Grammar School, known as Shore School, for more than $35 million. The school occupies land on two sides of Graythwaite. All proceeds from the sale are to go to the Graythwaite Trust and reinvested by NSW Health in rehabilitation services at Ryde Hospital.

In a last bid to stop the sale, Peter Besseling MP introduced a bill to the upper house of the NSW Parliament – the "Save Graythwaite Bill". It passed the upper house but was defeated along party lines in the lower house. It would have required Graythwaite Estate be retained in public ownership, preserved areas of open space, and preserved its heritage significance. The former WWI repatriation hospital will now be redefined as a private school.

Waverton Peninsula

Strong community action in the 1990s saved the former BP, Coal Loader and Caltex sites on the Waverton Peninsula from residential sub-division. The redevelopment of the Coal Loader as a Sustainability Centre is part of North Sydney Council's desire to preserve industrial heritage while creating community facilities. The Centre, due to operate from mid 2011, will showcase a range of sustainability features (including solar hot water, solar photovoltaics, rainwater reuse, composting and recycled building materials) and function as a sustainability resource space. Local residents and community groups will be encouraged to utilise the centre resources and partner with Council in the delivery of sustainable living workshops and events. Future plans for the five hectare site include a native plant community nursery, stormwater reuse and a veggie garden 'green roof' on the former Coal Loader platform.

Nutcote Conservation Works Complete

Essential conservation works have been completed at May Gibbs' Nutcote Cottage in Neutral Bay, helping to preserve this significant heritage property for current and future generations. The works were jointly funded by a $45,455 grant from the Australian Government's Jobs Fund Heritage Projects Program, together with $33,000 from North Sydney Council, and were project managed by the Council. The works included damp course improvement, painting the exterior of Nutcote, repairing the timber fascia to prevent further deterioration, upgrading external lighting and signage, as well as general repairs. Nutcote was designed in 1925 by the renowned Sydney architect, B.J. Waterhouse for May Gibbs and her husband, J.O. Kelly. May Gibbs lived at Nutcote until 1969 and it was here that she created her famous characters in the studio overlooking her Australiana garden. Nutcote has been preserved for the nation as an historic house museum. This picturesque harbourside cottage has been designed to tell the story of the life and times of one of Australia's premier children's authors and illustrators.

CASE STUDY

KU-RING-GAI COUNCIL – Successes and Failures in Heritage Preservation in Ku-ring-gai

The front (south) elevation of Peroomba, viewed from the southwest, Clive Lucas, Clive Lucas Stapleton & Partners, October 2008.

Failure: 9–15 Harrington Street, Warrawee "Peroomba"

The original house at 9–15 Harrington Street, Warrawee "Peroomba" was commissioned by Sir (William John) Victor Windeyer, a former Justice of the High Court of Australia. Designed by distinguished Australian architect William Rae Laurie and built in 1938, it was occupied continuously by his family until his wife Margaret's death in 2008. The house sat on large grounds which span across four titles and included a grass tennis court built in the 1940s, and a large oak tree planted shortly after the house was built. Clive Lucas and Associates inspected the house in 2008 before preparing a State Heritage Nomination Form which was rejected based on a lack of comparative analysis. In May 2010 Council received a pre-DA for demolition of the house under complying development. In its place were plans for a large residential house. Council resolved to prepare a draft Local Environmental Plan to include the house as a heritage item and to request the Minister for Planning place an Interim Heritage Order (IHO) on the house. The Minister placed an emergency order and an IHO on the house to allow an independent heritage assessment to be completed. Following an unsupportive heritage assessment the Minister for Planning lifted the IHO and the house was demolished.

Success: 1-5 Yarabah Avenue, Gordon

A heritage success is the recent Land and Environment Court judgment to refuse to demolish three existing dwellings and allow the construction of a RFB and basement car park within one of the newly gazetted Heritage Conservation Areas at 1-5 Yarabah Avenue, Gordon. The judgment deemed that "The proposed development is of a height, bulk and scale, that is not compatible with the character of the Yarabah Avenue HCA and will adversely impact on its heritage significance. Accordingly, we find that the proposal does not satisfy the planning intent of the area as proposed under the provisions of LEP 2010."

Street View of 1-5 Yarabah Avenue, Gordon, Lara Goldstein, Ku-ring-gai Council, September 2010.

TRANSPORT

Transport continues to be a key economic social and environmental concern in the NSROC area. Extensive details on current transport arrangements in the region are outlined in the 2008/2009 NSROC SoE Report.

Sustainable urban planning and transport must strike the right balance of effective and economic people movement with transport modes offering low energy and emissions. Sydney continues to struggle with the right mix of modes. In Northern Sydney there is a distinct and increasing reliance on private vehicle transport (as shown in Figure 14 revealing changes in travel modes between the last two census). It can be argued this trend stems from the expansion of toll and motorways, and the substantial residential growth within and outside the region. At the same time, there is evidence of an increasing strain on, and decreasing public confidence in, Sydney's existing passenger rail system.

In May 2010 the NSW Government Released a Metropolitan Transport Plan. The plan included various infrastructure proposals based on the intention to shift more people to public transport options. However for the NSROC and

surrounding regions the proposals fell considerably short and this was communicated to the State Government in an extensive submission.

NSROC has three main issues with the Metropolitan Transport Plan – governance arrangements; revenue sources and the selection of priority projects.

NSROC argued that the governance arrangement proposed by the plan did not effectively connect land use planning to transport planning. A key failure in the plan is the continued structure of "silos" of roads and other transport providers reflected in separate Ministers for Roads and for Transport. A further failure in the new Departmental structure is a separation of the Planning Minister from this structure.

NSROC also argued that new funding approaches for the substantial upgrades are required on the Sydney transport network and that innovative mechanisms should be examined. For example:

- federal funding conditional on achievement of economic, social or environmental outcomes similar to efficiency dividends or competition policy payments which tie State Government funding to the delivery of reforms or meeting of targets;
- accessing national superannuation contributions eg Future Funds;
- an equitable distribution of tolls across Sydney, and charges, taxes or transport levies that reflect the real costs (including emissions costs) of private modes of transport; and
- direct linking charges and payments to public transport funding – similar to the original petrol excise "3 by 3" model.

Furthermore NSROC argues that more direct incentives and penalties should also be explored to encourage individual and business behavioural change in favour of sustainable transport. This includes:

- congestion charging in terms of peak times, multiple passengers and freight vehicles movements;
- vehicle ownership requirements which provide incentives for low pollution, low impact vehicles – eg lower registration costs and parking permits, minimum travel distances (currently the Fringe Benefits Tax incentives are skewed to encourage greater driving distances) and support for share transport initiatives such as car share and community bus transport.

In its submission, NSROC advocated for a transparent decision criteria be developed for determining key improvements to the region's transport network. The proposed criteria should be:

- based on genuine need for the region;
- connected and beneficial to the broader Sydney region; and
- supported by independent assessment.

From a sustainability perspective, NSROC believes that the core objective for the Sydney transport system should be to shift from private to public transport dominance. With the projected population growth across the region, NSROC views mass transport systems such as rail, metro and light rail as the most cost effective way to reduce congestion, lower carbon emissions, and improve commuting times.

However NSROC also recognises that freight transport must also be examined in an integrated transport strategy. Both road and rail can operate as shared modes for passenger and freight and this cannot be isolated from public transport planning. This is why transport strategies for the key arterial roads and the M2-F3 link and regional rail infrastructure must be re-examined.

NSROC priorities for the region and adjacent areas are:

- **North-West Rail or Metro link**

There is a clear and demonstrable need for an integrated transport system in the North-West region, including road, rail and bus links. The establishment of a North-West Growth sector by the State Government without a mass transport link is untenable. The current transport infrastructure simply will not cope with anticipated growth over the next two decades.

As noted in this submission, the NSROC region and its surrounding corridors are experiencing increased congestion and longer travel times. This is in direct conflict with the Metropolitan Plans' objective to provide 30 minute public transport connections between work and home. The Metropolitan's Plan timetable will not see the North West Rail Link delivered until 2024 which will multiply these negative impacts for another 14 years. This will place extreme stress on these local communities and their environment and on the regional and broader Sydney economy. This project needs to be reprioritized to an immediate priority.

- **Parramatta to Chatswood Rail link**

The decision to truncate the Epping to Parramatta heavy rail line has already put significant demands on the regional network and failed to address the need for effective transport between major centres. The completion of the Epping to Parramatta rail line is essential and needs to be prioritized – providing full access between Parramatta/ Castle Hill/ Hornsby/ the City/ Chatswood and Macquarie University/Business Park and catering for the continued growth of the North-West.

- **Second Harbour Bridge rail crossing and fast North Shore line**

The existing train network in the northern region exceeds its capacity. Commuters in northern Sydney experience poor travelling conditions such as "standing room only" trips for long commutes in peak times. However the primary reason for these improvements is to allow new lines such as the Parramatta to Chatswood and North-West rail links to operate at their full potential.

- **Bus or light rail link from Chatswood to the Northern Beaches**

NSROC sees a clear need for transport improvements into the Northern Beaches region to allow those residents to access jobs in the NSROC region and beyond. NSROC does not have a specific preference for rail or bus links.

- **Transport strategies for Military – Spit Corridor, Victoria Road, Pennant Hills Road and the Pacific Highway**

These four corridors are identified as some of the most congested roads in the Sydney area. It is vital that long term strategic transport plans are developed to accommodate their use and alleviate their traffic impacts. In those relevant harbour adjacent areas, increased ferry services with complementary intermodal links (park and ride) should be examined to ease congestion.

- **Completion of M2- F3 link into the Sydney Orbital**

The productivity, environmental and amenity impacts of the current disconnect between the F3 at Hornsby and the M2 have been previously assessed in feasibility studies. It is simply not sustainable or efficient for the major national North -South road route in Australia's largest city to be interrupted with over 20 traffic lights along Pennant Hills Road.

- **Improved regional rail services to the Central Coast and Newcastle**

The population growth in the Central Coast and Newcastle drives demand for improvements of this existing regional rail line. In the short term, improvements to signalling and sequencing must be undertaken to the existing rail infrastructure. In the long term, NSROC urges genuine consideration of high speed trains to these major cities. As noted previously an integrated transport system must cater for the movement of freight as well as passengers. Freight capacity of both rail and road options must be considered across this region and into the growth areas of the Central Coast and Newcastle.

While the Metropolitan Transport Plan's restructure of state government agencies has not taken place with the creation of "NSW Transport", NSROC will endeavour to lobby State Government for take up of the other suggestions posed in terms of land use planning, revenue development and priority projects.

DELIVERING SUSTAINABLE TRANSPORT

Councils are a critical player in effective transport planning and management. Councils directly contribute to public transport through actions including local transport infrastructure provision, the development of alternative transport options like bike and pedestrian routes, and as direct providers and subsidisers of local community transport. Councils also play a critical role in the integration of transport and land use.

NSROC member councils manage public roads and related transport infrastructure that is valued at over $2 billion. Our councils also spend over $30 million each year on maintenance and provide over $1 million of community transport services to the region.

At a local level councils continue to support sustainable transport solutions. For example in 2009 North Sydney Council continued it's development of bike infrastructure.

CASE STUDY

NORTH SYDNEY COUNCIL – Bicycle Initiatives

North Sydney Bike Strategy 2009

Arup was commissioned by North Sydney Council (NSC) to prepare the North Sydney Bike Strategy 2009. The strategy will build on previous planning of bicycle infrastructure and subsequent implementation of cycle facilities, and will guide the ongoing implementation of cycle facilities. The bicycle strategy was developed to provide safe and convenient cycling routes, with a particular emphasis on commuter cycling. The intention of this emphasis is to reduce the number of work generated motor vehicle trips – thereby reducing traffic congestion and parking demand.

Bike Lockers and Bike Parking

Council has bicycle lockers and bike parking (racks) at various key nodal points. The intent of this is to provide destination parking for bikes and to encourage the community to consider riding bikes particularly for shorter distances of less than 5 kilometres. From May 2010 The Secure Mount St Bike Locker was full and a waiting list was put in place (approximately 4-5 months).

WASTE

Council waste management is an increasingly complex area. Councils have dual waste objectives: to reduce the volumes of waste generated but also to maximise the potential of waste to be recycled, re-used or used to generate energy.

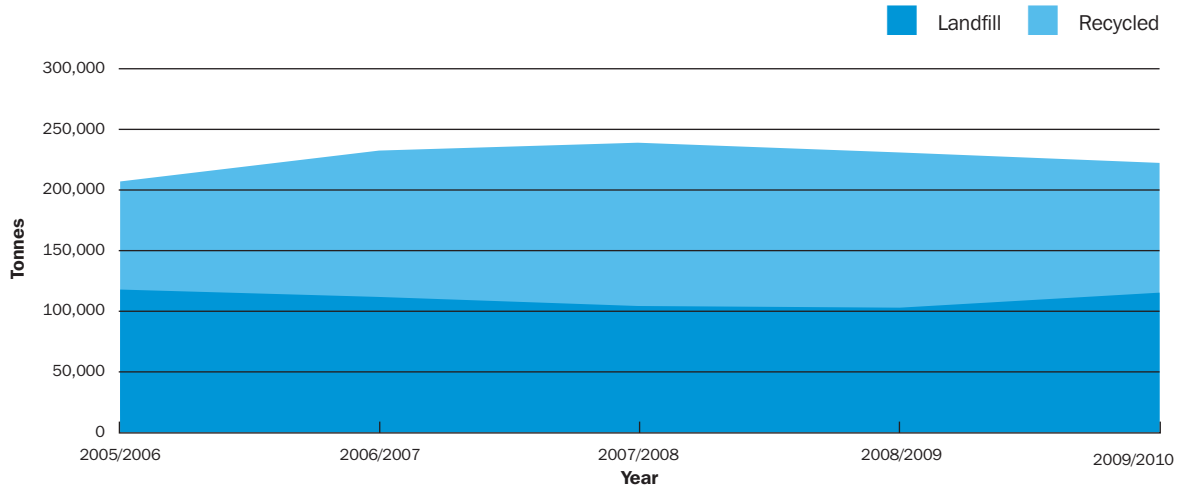
In 2008/2009 residents of the NSROC region generated 102,271 tonnes of material which went to landfill. Another 128,587 tonnes of material was recovered through recycling systems and an additional average of 100 kilos of green waste was recycled for each person in the region. In total, more waste was collected in 2008/2009 than in previous years, reflecting the region's growing population.

A different trend is observed in 2009/2010, that is, total waste to landfill rose but also total waste recycled fell. However overall waste created by the region has declined.

Table 11: Landfill and recycled waste tonnages by councils in 2009/2010

Council	Total resources to landfill (tonnes)	Total resources recycled including green	Total resources to landfill per capita (kgs) waste (tonnes)	Total resources recycled per capita (kgs)	Green waste diverted from landfill per person a year (kgs)
North Sydney	8,712	10,634	136	166	22
Lane Cove	6,358	5,337	195	164	52
Hunter's Hill	1,728	3,257.5	119	225	40.5
Ryde	24,314	20,789	235	117	83
Ku-ring-gai	22,098	33,438	198	300	160
Hornsby Shire	33,435	37,449	206	122	109
Willoughby	19,986	18,030	292	263	86
NSROC 2009/2010	**116,631**	**108,145.5**	**1,381 (Council average 197)**	**1,357 (Council average 193)**	**552.5 (Council average 78)**

Figure 5: NSROC landfill and recycled waste volume trends 2005/2010



Responding to waste issues

Councils look for innovative ways to help the community see the value in waste reduction and the opportunities for waste recycling. Two projects undertaken In 2009/2010 have been City of Ryde Council's Clothes Recycling Program and Hornsby Shire Council's "Returned to Glory" Recycled Art Project.

CASE STUDY

CITY OF RYDE COUNCIL – Clothes recycling program

City of Ryde Council has teamed up with The Smith Family (TSF) to encourage recycling of clothing by residents at selected locations across the city. The new Ryde green clothing bins feature both Council and TSF signage and were initially installed at 20 locations, chosen for ease of access and convenience to the public.

The clothes recycling program commenced in May 2010. From the 20 bins installed, around 2000kg per week of clothing is being collected for recycling, much of which may otherwise have ended up being landfilled. The program was recently expanded to 30 bins across the city and it is envisaged that bin numbers may be increased further to meet demand. The Ryde – TSF partnership allows for Council input into the number and location of bins across the city.

TSF is a charity-centred not-for-profit organisation. Ryde's clothing bin program therefore has multiple benefits including helping those in need, reducing waste management costs and diverting re-usable materials from landfill.

CASE STUDY

HORNSBY SHIRE COUNCIL – "Returned to Glory" recycled art

The Hornsby Shire Council 'Returned to Glory' Recycled Art Competition and Exhibition celebrates the re-use and recycling of waste in the Hornsby Shire area through art. Artists are invited to submit work which demonstrates the concept of resource recovery – turning waste into a resource through the use of recovered waste products and materials. Instead of going to landfill, materials which otherwise would have been wasted are transformed into beautiful pieces of art. Due to the success of the 1st competition/exhibition held in 2009 we run this program annually. The competition and exhibition was just as a success in 2010.

Zach Fenn – Runner up in Youth Category 2010 with his piece called "(Can't get any) Satisfaction".

The aim is to encourage people to think about whether an item is really 'rubbish' or can live again through recycling and reuse. The project also aims to educate people on the idea behind recycling; that most products can be reused; To raise awareness about which products can be recycled; To educate members of the community that not everything has to be thrown away, that items can have more than one life and To reach a sector of the community which might otherwise not be engaged

The partnerships formed with the Hornsby Art Society, other Council department, TAFE and corporations allow greater access and engagement to a sector of the community we would not normally reach.

After the exhibition the next stage is a travelling photographic exhibition. The travelling photographic exhibition showcases artworks via shopping centres, libraries and community centres reaching sectors of the community who would not normally visit an art gallery or be engaged through normal 'waste' education programs.

"Hundreds of images of material possessions from discarded junk mail and magazines assembled in order of cost and prestige. Negative Space, resembling a ladder, evokes notions of society's constant push to update and upgrade to the latest and greatest gadgets, appliances and items – the ongoing struggle to achieve material satisfaction."

NOISE

Throughout the NSROC region, six types of noise complaints predominate - barking dogs, air conditioners, swimming pool pumps, early-morning garbage trucks, and (less frequently) improperly set building alarms and the use of power tools. This is based on the most common complaints reported to each of the councils, but is not inconsistent with the patterns reported to the Department of Environment and Climate Change (DECCW) for all of Sydney.

Complaints reporting is one sub-set of the noise concerns. Road traffic and rail can also be major issues, especially when heavy vehicles apply their engine brakes or motorcycles with lower-quality mufflers accelerate. Concerns such as these are more likely to be detected in environmental surveys rather than in complaints registers, because they are more diffused and harder to tag to specific offenders. But more recent additions to the traffic-borne offenders, including offensive motor vehicle alarms and sound systems, have provoked regulatory action.

Table 12: Noise complaints received by Council within the NSROC region in 2009/2010										
Council	**Barking dogs**	**A/C**	**Building sites/ construction**	**Licensed premises**	**Garbage trucks**	**House & car alarms**	**Domestic noise source**	**Aircraft noise**	**Other**	**Total**
North Sydney	27	NA	40	NA	NA	NA	NA	15	170	252
Lane Cove	78	10	0	0	0	0	19	0	19	126
Hunter's Hill	6	10	8	2	4	2	12	160	0	204
Ryde	137	22	26	NA	7	7	30	NA	44	270
Ku-ring-gai	300	42	5	0	0	0	159	NA	159	506
Hornsby Shire	354	20	69	5	6	1	132	0	33	620
Willoughby	145	NA	80	NA	NA	NA	109	NA	NA	334
NSROC 2009/10	**1,047**	**104**	**228**	**7**	**17**	**10**	**461**	**175**	**425**	**2,312**
NSROC 2008/09	1,024	88	206	41	43	30	142	1844	481	3,899

Councils also receive complaints about aircraft noise however a better reflection of complaint patterns is shown in data provided by Air Services Australia as seen in Table 13.

With increasing demands on Sydney Airport and expected expansion of air traffic, aircraft noise concerns are expected to increase for NSROC residents. NSROC member councils have been active in engaging with consultation and advocacy mechanisms on aircraft complaints through such groups as the Sydney Airport Aviation Community Advocate. Of most concern is the failure of airport industry to communicate simply and consult effectively in noise complaint issues and impacts.

In September 2010 the Federal Government created an Airport Noise Ombudsman whose role includes review of:

- the handling of complaints or enquiries made to Airservices Australia about aircraft noise
- community consultation processes related to aircraft noise
- the presentation and distribution of aircraft noise-related information.

NSROC councils will seek direct engagement with this new body to establish more transparent processes for aircraft noise management.

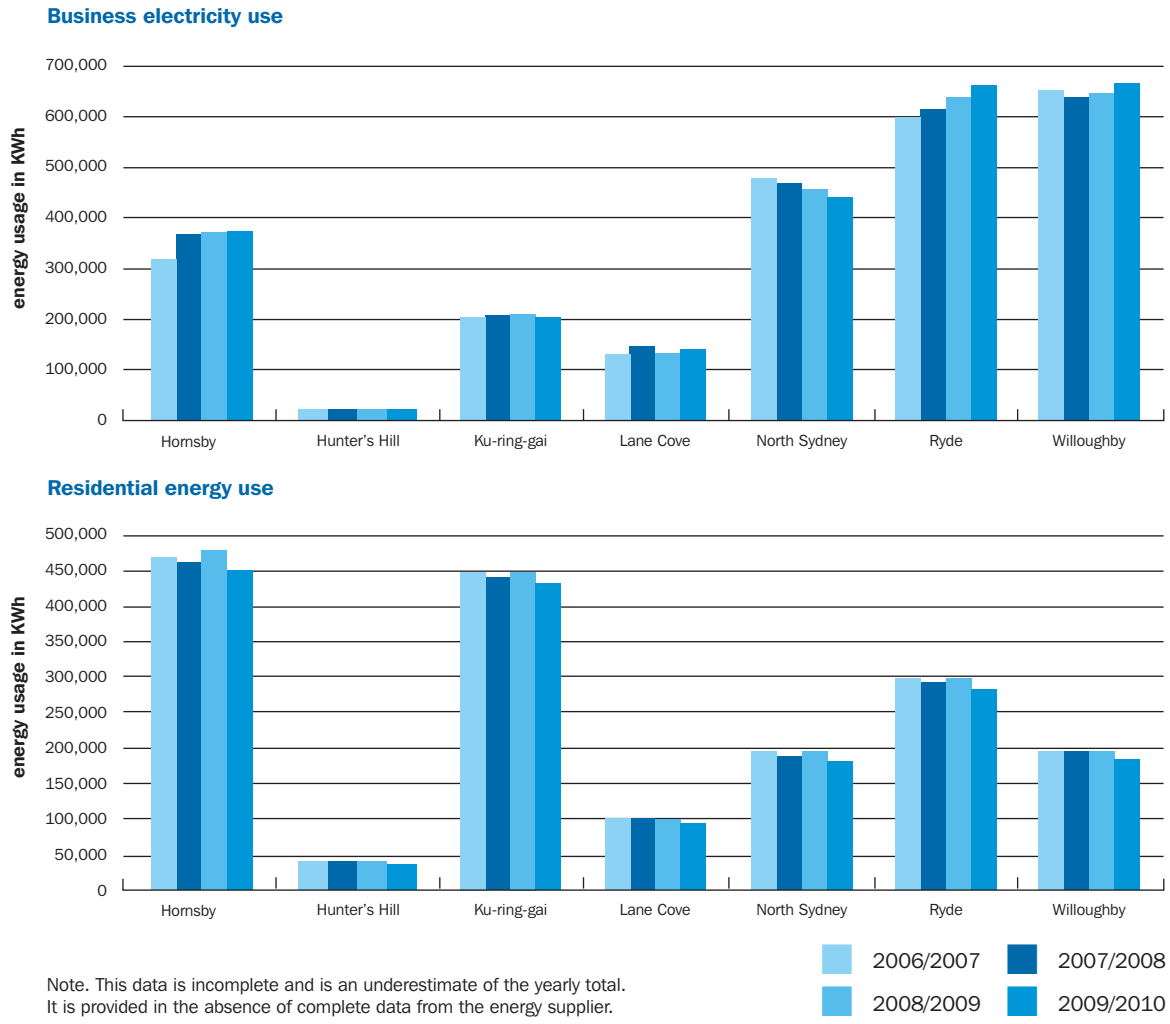
Table 13: Aircraft Complaints Key NSROC Suburbs 2007/2010			
Suburb	**2007/2008 Complaints (complainants)**	**2008/2009 Complaints (complainants)**	**2009/2010 Complaints (complainants)**
Artarmon/ Naremburn	4 (3)	1(1)	6 (5)
Chatswood /Willoughby	48 (11)	12 (3)	39 (8)
Cremorne/Neutral Bay	5 (5)	2 (1)	4 (3)
Epping	3 (2)	4 (4)	16 (8)
Gordon	21 (3)	1 (1)	1 (1)
Hornsby	7 (7)	5 (4)	26 (8)
Hunter's Hill	490 (36)	1,736 (41)	61 (34)
Killara	14 (8)	5(5)	13 (11)
Lane Cove	80 (26)	67 (24)	98(24)
North Sydney	3 (3)	0	1(1)
Pymble (& West Pymble)	30 (14)	26 (9)	18(8)
Riverview	29 (3)	13 (2)	21 (5)
Ryde*	63 (32)	90(58)	46 (34)
St Ives	9 (5)	7(3)	0
Wahroonga/ Waitara	16 (11)	9 (8)	14 (5)

** Ryde includes Denistone East, Eastwood, Gladesville, Macquarie Park, Marsfield, Putney, Ryde and East Ryde, North Ryde and West Ryde.*

ENERGY CONSUMPTION

Energy consumption continues to be a major concern for both the community and NSROC councils. Overall NSROC communities appear to be stabilising their energy consumption. Figure 6 shows that on average energy use in businesses has increased slightly by 0.6% while average energy use in residential activity has declined by a substantial 3.08% against the previous years consumption.

Figure 6: Energy consumption of Energy Australia customers within the NSROC region in 2009/2010



Note. This data is incomplete and is an underestimate of the yearly total.
It is provided in the absence of complete data from the energy supplier.

NSROC councils can contribute to improving energy consumption through direct action to minimise their own consumption and use on council assets. Actions include the installation of timers and energy efficient lighting in council buildings, change of plant and equipment to lower energy models, and the introduction of photovoltaics and other renewable energy systems on council properties as noted in the 2008/2009 SoE Report.

Energy prices are scheduled to increase substantially in NSW in the coming years. This will affect councils and the community. An area of particular concern for councils is the ongoing costs of street lighting.

Street lighting infrastructure in the NSROC region is owned by Energy Australia. Councils are charged a fee for maintenance of the street lighting poles and a fee for energy consumed by the street lighting (which may be provided by Energy Australia or another energy retailer).

In 2009 EnergyAustralia's proposed a price increase of approximately 78% in street lighting network maintenance charges over the coming regulatory period. This is a difficult situation for councils. Street lighting is an essential service and Councils have little scope to reduce these increasing costs. Naturally councils cannot reduce the actual street lighting as this would impact on public safety. However NSROC, along with other Councils in Sydney, through a request to the Australian Energy Regulator and the NSW Government, have sought a commitment from Energy Australia that

its infrastructure upgrades will include energy efficiency products and systems to improve reliability as a condition to payment of these very substantial maintenance fee increases.

Councils also contribute to consumption minimisation in the community through community education and assistance initiatives.

Two energy reduction initiatives commenced by councils this year are Ku-ring-gai's Energy Performance Contracts and Willoughby's Climate Clever Apartment Project.

CASE STUDY

KU-RING-GAI COUNCIL – Energy Performance Contract

Council has reduced greenhouse emissions at selected sites through energy efficiency actions undertaken as part of the Energy Performance Contract. This identifies a change in the long term trend of our emissions which generally have increased on an annual basis. Facilities where energy efficiency projects have been implemented as part of the 2009 Energy Performance Contract are showing a decrease in energy consumption which has affected the overall consumption trend of facilities. Although savings have been identified, they are not as substantial as expected. Council has started undertaking measurement and verification of the success of this contract. Any shortfall in the expected energy savings will be rectified as part of this process either through alteration of or addition to the installed energy efficient fixtures, or through a financial reimbursement of savings shortfall.

CASE STUDY

WILLOUGHBY CITY COUNCIL – Climate Clever Apartments

The ClimateClever Apartments program is an innovative approach by Willoughby City Council to work with local apartment buildings to help reduce their buildings operating costs and carbon footprint. The program is part of Willoughby City Councils award winning ClimateClever education campaign which aims to foster a vision of Willoughby City becoming a leader of sustainability.

The ClimateClever Apartments program has already successfully engaged 26 apartment buildings of varying sizes from small low rise buildings with just 10 apartments to huge hire rise complexes containing over 750 apartments. Each Owners Corporation has received a detailed assessment of the common areas of their apartment building and provided with a detailed report of the assessment finding and a tailored action plan identifying cost effective measures to reduce the energy and water consumption of their building.

The second phase 2 is now underway which aims to help apartment buildings implement cost effective energy and water efficiency measures. To encourage Owners Corporations to move to implementation, Council has introduced a grants scheme to provide co-funding. Council hopes to foster the development of at least three showcase apartment buildings as demonstration sites to encourage others buildings to follow their lead.

WATER

Sydney's water resources are under pressure from increasing demand for, and consumption of, town water supplies. Population growth, lifestyle changes and the uncertainty of future climate change make the extent of these pressures difficult to measure. All communities must strive to reduce water consumption and where possible harvest and manage water locally.

In 2009/2010 water consumptions across the region has increased by around 1million kilolitres or around 2% which is half as much as the increase of the previous reporting period. (In 2007/2008 to 2008/2009 water consumption increased by around 2 million kilolitres). Water restrictions (Sydney Water's Waterwise rules) still apply across the region.

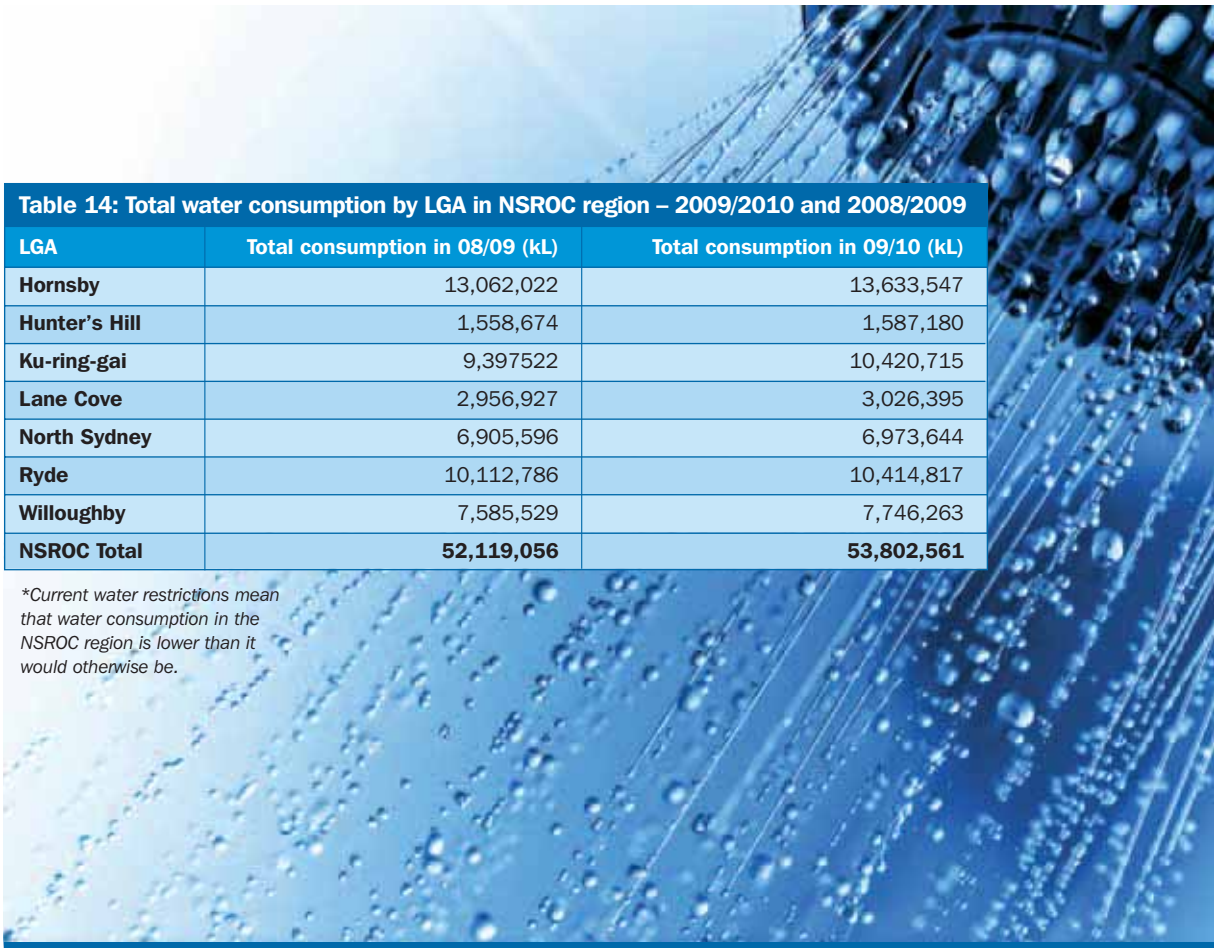


Table 14: Total water consumption by LGA in NSROC region – 2009/2010 and 2008/2009

LGA	Total consumption in 08/09 (kL)	Total consumption in 09/10 (kL)
Hornsby	13,062,022	13,633,547
Hunter's Hill	1,558,674	1,587,180
Ku-ring-gai	9,397522	10,420,715
Lane Cove	2,956,927	3,026,395
North Sydney	6,905,596	6,973,644
Ryde	10,112,786	10,414,817
Willoughby	7,585,529	7,746,263
NSROC Total	**52,119,056**	**53,802,561**

**Current water restrictions mean that water consumption in the NSROC region is lower than it would otherwise be.*

Table 15: Water Consumption across the NSROC region by building type in kilolitres , 2009/2010

Council	Hornsby	Ryde	Hunter's Hill	Ku-ring-gai	Lane Cove	North Sydney	Willoughby
Commercial	1,378,243	1,627,883	90,790	542,646	277,413	1,468,084	1,368,067
Houses	8,991,873	4,838,167	920,391	8,305,486	1,532,466	1,209,991	3,294,027
Industrial	334,980	490,467	735	9,709	195,476	18,892	527,049
Other	703,943	669,114	292,084	593,606	125,852	313,074	173,294
Units/Flats	2,224,508	2,789,186	283,180	969,268	895,188	3,963,603	2,383,826
Total	**13,633,547**	**10,414,817**	**1,587,180**	**10,420,715**	**3,026,395**	**6,973,644**	**7,746,263**

Consumption kLs for the year to June 30, 2010 – Sydney Water
**Current water restrictions mean that water consumption in the NSROC region is lower than it would otherwise be.*

The NSROC region has a slightly higher rainfall rate compared with other areas of Sydney. While this may become less significant with overall rainfall declines anticipated with climate change, it does mean there is some scope for local rainfall harvesting and retention. This is the focus of NSROC councils in recent years. Two examples of local council initiatives are the Ryde Aquatic Centre Water Conservation Program and the Hunter's Hill Water Savings Program.

CASE STUDY

CITY OF RYDE COUNCIL – The Ryde Aquatic Leisure Centre (RALC) Water Conservation Program

The installation of major rainwater harvesting, UV disinfection and backwash recovery systems at the RALC has saved over 60% of water normally used by the Centre, measured from the 2003/2004 baseline year. In real terms, it resulted in annual savings of over 32,000 kL of potable water. The backwash recovery system, for example, cleans and recycles water that would have previously discharged to sewer.

Reductions in mains water consumption from a daily average of 146.6 kL per day in 2003/2004 to 67.2kL per day have saved Council over $55,000 per year.

This exceeded the forecasted savings by several thousand kL each year as measured by Council's Building Management System.

The combination of the three systems within a swim centre context presents a unique and transferable contribution to minimising potable water related environmental stresses and ensuring water conservation.

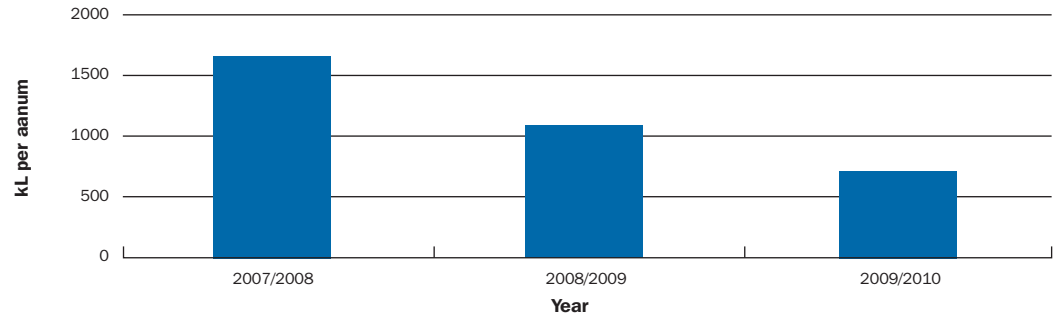
CASE STUDY

HUNTER'S HILL COUNCIL – Water Savings Program

Over the last two years, there have been a number of grants implemented to save water in the Hunter's Hill Municipality. Hunter's Hill Council has also been working with Sydney Water's Every Drop Counts program and ICLEI Water to reduce potable water use.

Excellent water saving have been achieved at the Town Hall and Works Depot since the installation of four rainwater tanks, dual flush toilets and water efficient retrofits in 2009 (See graph). The grey water collected has been used to flush Council and Depot toilets and water nursery plants. Hunter's Hill Council and the Department of Environment Climate Change and Water (DECCW) jointly funded this project, and future funding for rainwater tanks and water saving retrofits at Hunter's Hill Preschool.

Water Savings at Hunter's Hill Council



COMMUNITY HEALTH

Community health outcomes can be linked to the environment and supported by environmental initiatives. NSROC initiatives on community health take two forms:

- NSROC advocates for key health outcomes including the provision of direct health services and complementary environmental and health management; and,
- member councils provide hands on, local community health programs and facilities.

The age structure and population health statistics for the region are noted in the 2008/2009 NSROC SoE report. The NSROC area has a statistcally healthier population than the Sydney area. However it has a high percentage of ageing population. The latest analysis by the Northern Sydney Central Coast Area Health Service estimates that the fastest growing age group to 2016 will be people aged 85 years and older at 39.7%. There is also expected to be strong growth in persons 65 to 69 years (37.7%) and 70 to 74 years (32.6%). (Although these figures include Central Coast populations, the proportions are roughly representative of the NSROC region). Ageing populations bring challenges to councils in providing accessible infrastructure and opportunities to an ageing population.

In 2009/2010 councils have continued to provide opportunities for their communities to engage with each other and the environment for mutual benefits.

CASE STUDY

NORTH SYDNEY COUNCIL – Healthy Focus Seniors Week

Heath and wellbeing were the theme to 2010's Seniors Week events in North Sydney, with a range of free activities being held between 21-28 March. The healthy lifestyle activities kicked off with a Come and Try Upright and Active Class at Neutral Bay Community Centre. Other activities included Internet for Beginner's classes; Tai Chi, Qi Gong and Meditation classes; a grandparent and grandchildren biscuit decorating class and Growing Old Disgracefully concert including comic songs, music hall, toe tappers, bush yarns, juggling and magic.

CASE STUDY

HORNSBY SHIRE COUNCIL – Fagan Park

The Hornsby Shire Council Fagan Park Eco Garden showcases gardening techniques which are environmentally friendly, sustainable and productive. It was established in 2000 thanks to the Northern Sydney Waste Board, Hornsby Shire Council and a number of committed and enthusiastic volunteers.

Over the last ten years the Eco Garden has given visitors a place to enjoy while learning about the many aspects of Eco Gardening. People can learn about growing vegetables and herbs, composting and worm farms, no dig gardening, native plants and non toxic gardening methods. We also have displays using reused tyres, pavers and timbers.

From across the Shire both individual volunteers and groups have contributed to its upkeep mulching, planting and harvesting as well as providing social opportunities.

This year the Eco Garden has grown to provide a more engaging experience. We have run Eco Gardening Basics and Worm Farm/Composting workshops. There have also been school holiday activities for preschool and primary school age children. There are more informative boards and signage on plants and garden beds.

We also offer an offsite program that residents can participate in their own place called Satellite Seeds and Seedlings. This program helps the Eco Garden in raising seeds and seedlings while extending the reach of the Eco Garden message to those that are unable to come out.

It is planned to link information in the Eco Garden to the Council website and to continue with the informal learning and activities that currently exists.

3 Bushland

Bushland

The NSROC region covers more than 680 square kilometres and includes more than 7000 hectares of bushland. Some of the largest tracts of bushland in the Sydney metropolitan area are located in the region.

BUSHLAND MANAGEMENT

Northern Sydney is privileged to be surrounded by national parks such as the extensive Ku-ring-gai and Murramurra National Parks to the north, and includes important areas of native bushland within its borders. The community highly values native bushland for its cultural, recreational and aesthetic values. It contributes to air and water quality, and provides unique habitats essential for the preservation of native flora and fauna.

Bushland is highly valued by the community for its cultural, recreational and aesthetic values. It contributes to air and water quality, and provides unique habitats essential for the preservation of native flora and fauna.

Bushland conservation is critical to the protection of biodiversity – the variety of different plants, animals and micro-organisms, their genes and the ecosystems of which they are a part. Its economic value includes its significant contribution to local economies through tourism and leisure related activities.

Native plants and animals, and remnant bushland are visible signs of the ecosystem functioning in urban areas. To protect this local biodiversity it is critical to conserve native vegetation and wildlife. Some of the pressures on the bushland vegetation and wildlife in the NSROC area include:

- clearing of bushland for housing, roads and industrial developments
- adverse human impacts – weeds, rubbish dumping, encroachments, impacts of pets
- structural changes to the bushland – decreased species diversity including tree death, removal of habitat, changes to fire regime, increased soil nutrient levels
- changes in drainage – stormwater runoff
- destabilisation of water courses – erosion, scouring flows, increased sediment loads and nutrient pollution

Urban development has severely affected bushland areas and biodiversity in the Sydney metropolitan area, with only about 12% of the city's original bushland remaining. The Metropolitan Strategy developed by the State Government recognised biodiversity conservation as one of the central environmental challenges we face. This is critical in planning for continued urban growth to provide for Sydney's expanding population.

NSROC councils play a key role in bushland management. However there are considerable differences between councils in terms of the land they directly control. Most of NSROC bushland areas are in the north, a large portion of which is national park and under State Government control. Other areas of bushland such as in North Sydney are predominantly the direct responsibility of councils (see Table 16). Consequently some councils have more engagement and joint activity with the State government in bushland management.

Table 16: Bushland across the NSROC area in 2009/2010

Council	Total area of bushland (ha)	Total area of bushland in LGA under council control (ha)
North Sydney	50	49
Lane Cove	123	93
Hunter's Hill	40	30
Ryde	559	209
Ku-ring-gai	3,148	1,161
Hornsby Shire	38,089	5,750
Willoughby	338	330
NSROC	**42,347**	**7,622**

In addition to dedicated staff including rangers and bushland regenerators, a critical mechanism for caring for bushland is through the network of volunteers that are marshalled by councils and other organisations.

In 2008/2009 it was estimated that nearly 50,000 hours of work was provided by bushland volunteers at a value of over $1million. In 2009/2010 a similar contribution has been made by bushcare volunteers.

Table 17: The contribution of bushcare volunteers in the NSROC region in 2009/2010			
Council	**Volunteer numbers**	**Volunteer hours**	**Value of hours (in dollars @ $25 per hour)**
North Sydney	213	3,100	77,500
Lane Cove	237	3,725	93,125
Hunter's Hill	70	2,300	57,500
Ryde	146	3,473	86,825
Ku-ring-gai	925	12,500	312,500
Hornsby Shire	871	17,000	425,000
Willoughby	300	5,400	135,000
NSROC	**2,762**	**47,498**	**1,187,450**

FLORA AND FAUNA

Flora and fauna numbers across the NSROC region have not changed significantly to those reported in the 2008-2009 NSROC Regional SoE Report. Councils continue to employ a variety of techniques to manage introduced flora and fauna focusing on feral animals, pest species and noxious weeds.

Despite continued efforts by councils and volunteers, there has been no significant changes in threatened or vulnerable species in the region. Appendix 1 provides the latest summary of threatened flora and fauna for each NSROC LGA.

2010 has been the International Year of Biodiversity and councils have been active in informing their community and inspiring action to preserve and protect the natural environment. A summary of initiatives are detailed below.

CASE STUDY

LANE COVE COUNCIL – Tambourine Bay Park

Council completed upgrades along the small creek line that flows through Tambourine Bay Park from Miramont Ave to the Bay. The goals of this project included improving accessibility to an underutilised urban open space, increase amenity through the removal of invasive weed species (Willow Trees) and improve an urban water course through creek stabilisation work. The project was funded via Council's Sustainability Levy.

The Tambourine Bay Creek Restoration Project won the 2010 National Environmental Design Award from the Australian Institute of Landscape Designers and Managers for Council's contractors.

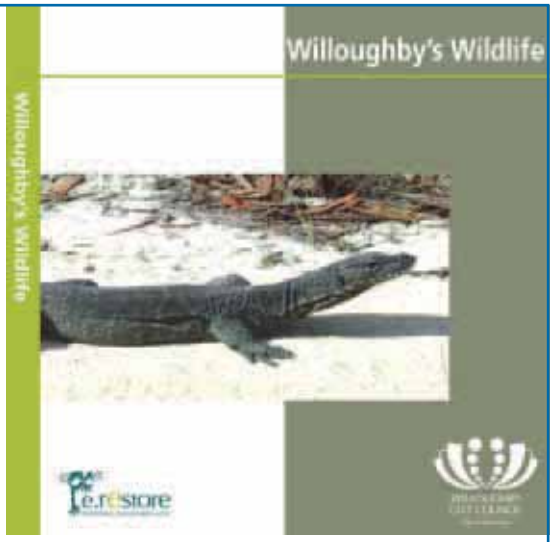
CASE STUDY

WILLOUGHBY CITY COUNCIL – Wildlife Book

Willoughby's Wildlife is a new book prepared by Council's Bushland Section to enthuse and inform the community about the range of fauna and habitats in the City. It draws on the fauna studies of Dr Arthur White and bird surveys of Andy Burton.

The book begins with a history of the changes to the natural landscape and ends with the ways it is being preserved and enhanced today. Although several fauna species are returning to Willoughby, the threats to their survival in an urban landscape is a vital theme of the book.

Superb photographs by community members and staff show off various types of fauna, including insects and feral animals, along with their habitats. There is a strong focus on how the community is working to preserve Willoughby's fauna and habitats. In the final section, readers are encouraged to participate in walks and programs to enjoy and learn about Willoughby's wildlife.



CASE STUDY

HUNTER'S HILL COUNCIL – Murray Prior Reserve

Hunter's Hill Council received a grant from the Sharing Sydney Harbour Access Program to improve public access to and use of the currently "hidden" Murray Prior Reserve on Tarban Creek – a tributary of the Parramatta River. The upgrade and improvements are anticipated to project over the next two-year period.

The walking track was hidden, incomplete and narrow in sections. Accessibility has been improved by the installation of wooden steps leading to a grassy picnic area where seating will be installed to allow people to relax and enjoy the natural environment. Murray Prior Reserve forms part of a proposed walking trail linking to a vision for a regional walking trail for the Parramatta River and its tributaries.

Bush regeneration and landscaping works are being carried out to improve the biodiversity and aesthetics values of the reserve. Natural and cultural heritage signage will be erected at the entrance and along the foreshore to encourage people to visit the area. Dinghy storage racks will be installed to improve recreational access to the foreshore and to help protect natural and cultural heritage values.

In addition the project aims to encourage bush friendly behaviours in neighbours and establish a bushcare group in the reserve.

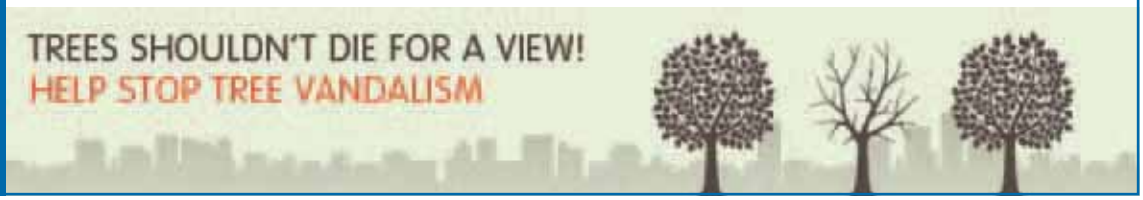
CASE STUDY

NORTH SYDNEY COUNCIL – Tree Vandalism Campaign

In North Sydney, as in other coastal areas of NSW, native trees are being killed for water views. All the social, economic and environmental benefits provided by trees are incrementally reduced with every healthy tree killed.

North Sydney Council is working to address this problem through a combination of regulatory policy and community education. The NSW Environmental Trust's Urban Sustainability Program has provided Council with grant funding to develop the project "Smart Trees - Blue Harbour". As part of this project, Council surveyed local community attitudes toward trees and used the data to develop a new education campaign entitled "Trees Shouldn't Die for a View". The resulting brochure, web page and reporting system makes it easier for residents to report tree vandalism to Council and ensures that sufficient detail is received for an investigation to be launched.

In addition to the education component of this project, Council will also develop a regionally focussed Tree Vandalism Policy that integrates the combined approaches of community education with a concise regulatory process following instances of tree vandalism. Adoption by other coastal councils will be encouraged through free dissemination of the policy document and associated education materials, with the obvious result being a more consistent approach to managing the issue of tree vandalism across local government boundaries.



CASE STUDY

KU-RING-GAI COUNCIL – WildThings

WildThings is an environmental education collaborative program between Ku-ring-gai Council and the community. Its key aims are to promote, protect and proliferate wildlife in urban areas. The program is licensed to distribute native fish species, bluetongue lizards and native stingless bees into suitable garden habitats around the community. Council is extending its promotion of this program in an effort to increase its environmental education and understanding within the community.

Council recognises that the local residents highly value their natural surroundings and the wildlife that often share our living spaces. The program has as a result experienced a steady growth over the three years since being introduced. The increasing demand will continue to drive the development of this project over the coming year, with expansion in to other councils now being planned.

The program gives community members the chance to partake in sustainable gardening workshops, find out how to convert your disused backyard swimming pool into a thriving pond, learn about various wildlife that visit your garden, and identify locally native plants and common weeds.

An example of a WildThings initiative is the Pool to Pond workshops held in early 2010 which gave tips on how to turn pools into natural ponds for wildlife.

In addition to these initiatives a key concern for bushland management is fire management. Councils work closely with fire services to ensure fire incidents are minimised. Controlled hazard reduction burns are part of this process. In 2008/2009 there were 20 burns across the region covering around 100 hectares. In 2009/2010 there was a major burn program in the Hornsby Shire of over 800 hectares bringing the total burn to over 900 hectares across the region for the 2009/2010 financial year.

Table 18: NSROC Fire Hazard Management 2009/2010

Council	Number of sites of hazard reduction burns	Area burnt (by hectare)
North Sydney	5	1.7
Lane Cove	0	0
Hunter's Hill	2	1
Ryde	1	3
Ku-ring-gai	13	81
Hornsby Shire	32	816*
Willoughby	10	1.7
NSROC	**63**	**904.4**

** The Hornsby reduction burn included a major burn of the Berowra Valley Regional Park, plus burns on crown land, national parks and on private properties.*

OPEN SPACE

In addition to bushland, the NSROC region has a variety of active and passive open spaces which contribute to the environmental amenity of the region.

Open space in the NSROC region is of considerable importance. The NSROC councils have expressed increasing concern over the shrinkage of open space available in the region in relation to continued population growth. There is a continuing tension to have open space resumed into urban development. These concerns have been put to NSW State Government as part of the NSROC formal response to the NSW State Government's 2010 Metropolitan Strategy Review.

Councils are being innovative and proactive in maintenance of open space and will be considering how best to maximise the public utility from existing places and facilities. This is demonstrated through activities such as upgrading walking trails and installing exercise stops, dog and playground equipment in smaller parks.

A specific NSROC project, which commenced in 2009 and is due for completion in 2010, is a Regional Sportsground Management Strategy. This strategy recognises that councils must maximize the utility of existing open space to provide for growing demand. Consideration is being given to upgrading and diversifying the functionality of sporting ground as well as reducing water and energy consumption on these sites.

Table 19: Open Space areas in NSROC Region – 2009/2010

Council	Volume of open space under council management (ha)	Volume of open space per capita (square metres)
North Sydney	145	25
Lane Cove	157	49
Hunter's Hill	67	50
Ryde	355	34
Ku-ring-gai	1,161	114
Hornsby	1,285	170
Willoughby	432	63
NSROC	**3,602**	**72**

CASE STUDY

HORNSBY SHIRE COUNCIL – Rural Lands Incentive Program

The Rural Lands Incentive Program is a program for rural land holders of Hornsby Shire Council with properties 2ha or greater. The program is designed to engage residents in planning their properties for biodiversity and catchment related outcomes. Key features of this program include a site visit by a Council staff member, training courses, funding and incentives for on-ground works.

RLIP is an entirely voluntary program that provides residents with:

- Skills in sustainable and long-term land and water quality management
- An awareness of why biodiversity conservation and land/water quality issues are important to the individual and community
- An understanding of how to plan future activities on their land, prioritise works, develop realistic time frames, goal setting/targets, vegetation mapping, monitor progress over time and costing considerations.

Participants may:

- receive a tailored information package, technical advice and guidance
- attend a series of free educational workshops
- attend a Property Planning Course for a subsidised cost
- access various incentives (i.e. fencing, materials, provenance tube stock and subsidies for contractors) after a Property Management Plan has been produced.

To date, over 110 rural residential properties have received an educational site inspection. People from 42 properties have attended Property Management Planning Courses and 30 Property Management Plans have been submitted and approved. Nineteen property owners have progressed through the program, receiving on-ground incentives (such as subsidised or free native plants and materials, subsidies for approved projects such as revegetation of creek lines, fencing to control stock and bushland regeneration). One property has reached the final stage of the program and obtained a voluntary conservation agreement with the NSW Department of Environment, Climate Change & Water.

In response to the involvement in the program it is estimated a total of $60,000 has been spent by rural residents on in-kind labour and the provision of materials. All participants improved either the stormwater management or biodiversity conservation on their properties.

Of all the participating landholders, 82% had not been involved in any other Council or environmental program (eg Landcare, bush regeneration groups) previously and some have taken this opportunity to join a local environmental group. This has generated a more involved community contributing to improved catchment and bushland health.

4 Water

An outstanding feature of the northern Sydney region is its extensive interface with water bodies particularly Sydney Harbour, Parramatta River, Lane Cove River, Middle Harbour and estuarine reaches of the Hawkesbury River. These are not only iconic for Sydney residents, but have contemporary and historical meaning for all Australians. The seven NSROC councils share responsibility for the management of river, estuarine or coastal stretches of one or more of these prominent water bodies with up to 20 other agencies or groups.

Clean water supports a healthy ecosystem and thereby our own health. However, the reverse is also true; a healthy ecosystem generates and maintains a clean water supply, hence benefiting our health. Measuring and protecting water quality remains a significant challenge for northern Sydney councils. This is because the resource demands in procuring good water quality data sets and the many variables which can affect water quality are beyond the control of individual councils.

Water quality in our creeks

In 2008/2009 NSROC reported on water quality based on "SIGNAL" measures which relate to levels of macro invertebrates in waterways (Stream Invertebrate Grade Number Average Level). The greater the number and diversity of macro invertebrates is one way of measuring the environmental "health" of a creek. It was generally recognised that, given the close urban development in some of the region, creek quality in the NSROC region is not as high as in pristine areas.

SIGNAL2 scores are presented in Table 20 where each water bug is assigned a value: 1 being very tolerant and 10 being very sensitive. These values are used to calculate an 'average score' for a river or stream. A low SIGNAL2 score indicates poor water quality, potentially due to low dissolved oxygen, turbidity, salinity, excess nutrients or another form of pollutant. Higher SIGNAL2 scores are indicative of good water quality and healthier rivers or streams.

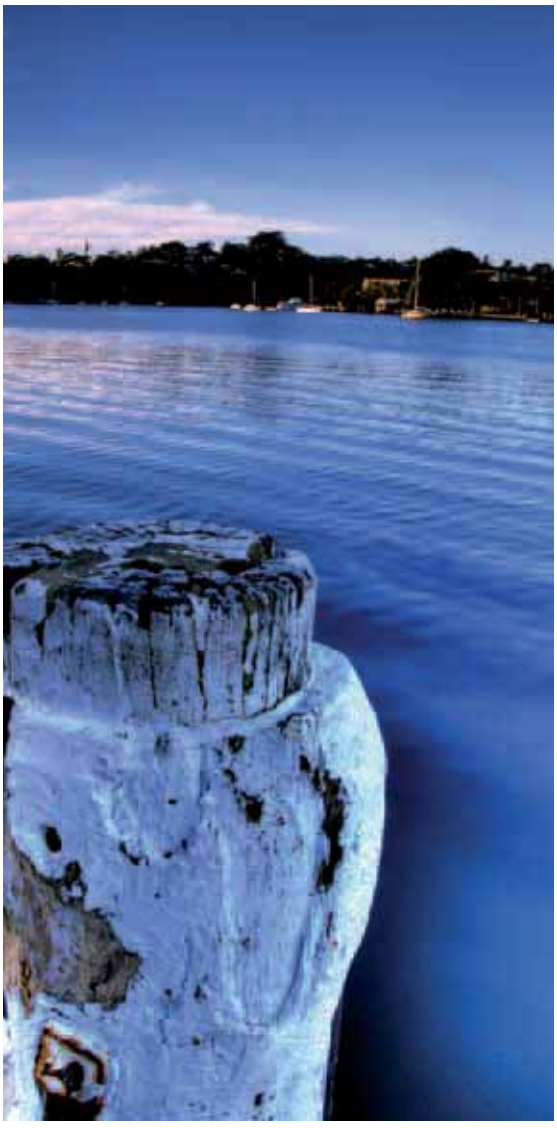


Table 20: Water quality results at sites within the NSROC Region 2009/2010

Catchment	Locality	Signal
Ryde	Buffalo Ck	3.27
	Terry's Ck	2.27
	Archers Ck	2.9
	Porters Ck	2.84
	Shrimptons Ck	2.83
Willoughby	Swains Ck	3
	Flat rock Ck	2.5
	Sailors Bay	3.75
	Scotts Ck	4.3
	Sugarloaf Ck	2.28
	Blue Gum Ck	3.7
Ku-ring-gai	Stony Creek	3.42
	Barra Brui creek	3.55
	Caley Brook	3.54
	Blue Gum Creek	3.54
	Kissing Point C	4.38
	Fox Valley Upper	3.89
Lane Cove	Gore Ck	3.0
	Stringybark Ck	3.0
Hornsby Shire*	Hornsby Ck	NA
	Smugglers Ck	NA
	Colah Ck	NA
	Terrys Ck	NA
Hunter's Hill	Tarban creek	3.0
	Brickmakers Creek	2.9
North Sydney	Berry Ck	3.16 (oct '09) 3.33 (Apr '10)

Notes: Hornsby Shire Council has continued water monitoring at 35 sites in creeks and estuary for physochemical, algal and bacterial parameters. That data is detailed in annual reports to the community; the last report was competed in November 2009. Monitoring for macroinvertebrates and diatoms was temporarily discontinued in 2008 and a review of past data is being undertaken; a review report is due September 2010.

CASE STUDY

LOWER NORTH SHORE WATER QUALITY MONITORING PROGRAM

Water quality monitoring is a useful technique to assess the health of the water for aquatic ecosystems, identify changes in conditions and to determine if management practices in place are effective in protecting the marine environment from the effects of land based pollution.

The Lower North Shore Water Quality Monitoring Program (LNSWQMP) was established through joint consultation between Willoughby, North Sydney, Lane Cove and Mosman Council.

All councils were considering to design and implement a water quality monitoring program and it was agreed to work together to design and implement a program that would be consistent in all four (4) local government areas. A detailed project brief was prepared and sent out to consultants for expression of interest to undertake field sampling, analysis and reporting of results. The four Councils agreed to participate and a consultant was chosen to undertake the work commencing in June 2009. Sampling has been undertaken on a quarterly basis including separate sampling after wet weather at a total of 25 sites across the four Council areas.

Water quality in our harbour beaches

In the 2008/2009 SoE report, NSROC noted the compliance by percentage of pollution at the main NSROC harbour beaches and swimming baths as reported by the DECCW Beachwatch Reporting Program.

The 2008 National Health and Medical Research Council guidelines for Managing Risks in Recreational Water recommend that recreational water quality is no longer reported as percent compliance based on microbial data, but as an annual Beach Suitability Grades. The Beach Suitability Grades can be either Very Good, Good, Fair, Poor or Very Poor. Definitions for these classifications are shown at www.environment.nsw.gov.au/beach/beachclassification

Below are the Beach Suitability Grades for NSROC swimming sites which will be reported in the DECCW 2009/2010 State of the Beaches Report.

Swimming site	Beach Suitability Grade
Tambourine Bay	Poor
Woodford Bay	Fair
Woolwich Baths	Fair
Greenwich Baths	Good
Northbridge Baths	Fair
Hayes Street Beach	Good

The beach suitability grades are determined from a sanitary inspection of the swimming site and an assessment of the microbial water quality. The sanitary inspection is a qualitative assessment undertaken to identify all sources of faecal contamination that could affect the swimming location and assess the risk to public health posed by these sources. The microbial water quality assessment is determined by calculating the 95th percentile of enterococci water quality data. For more detailed information on this visit www.environment.nsw.gov.au/beach/thewaterqualityguidelines

- Greenwich Baths and Hayes Street Beach were classified as Good. This means they generally have good water quality, and are considered safe for swimming most of the time. These sites have some potential pollution sources which are generally triggered after rainfall.
- Woodford Bay, Woolwich Baths and Northbridge Baths are classified as Fair. This means these sites generally have good microbial water quality particularly during dry weather, but may be susceptible to faecal pollution from several sources following rainfall or if there are signs of pollution.
- Tambourine Bay was classified as Poor. This site is susceptible to faecal contamination from a number of significant pollution sources, particularly after rainfall and occasionally during dry weather conditions. Swimming should be avoided at these sites during and after rain.

Water quality in stormwater systems

NSROC councils continue to invest in improvements to stormwater systems to improve environmental outcomes. This year NSROC councils made a substantial investment in new gross pollutant traps (GPTs) in the region (almost double the investment of the previous year).

Interestingly, across the region the waste tonnage removed from GPTs is less than the previous year. While this may be due to a variety of factors, such as less storm events, it can be also be interpreted as a sign of reduced dumping in stormwater systems and surrounds.

Table 21: Performance and expenditure relating to gross pollutant traps in the NSROC region in 2009/2010

Council	Gross Pollutant Traps (GPTs) per area	Tonnage waste removed from GPTs	Cost of GPT construction ($)	Cost of GPT maintenance ($)
North Sydney	27	315	12,000	60,000
Lane Cove	5	31	0	16,198
Hunter's Hill	32	10	15,000	25,000
Ryde	30	219	270,000	51,000
Ku-ring-gai	203	104.3	0	14,980
Hornsby Shire	402	721	890,000	150,000
Willoughby	6	79.9	455,000	3,640
NSROC region 2009/2010	**705**	**1480.2**	**1,642,000**	**320,818**
NSROC region 2008/2009	679	1824.5	870,000	615,662
NSROC Region 2007/2008	595	2,267	1,207,000	603,766
NSROC Region 2006/2007	584	1,926	775,000	496,664

CASE STUDY

CITY OF RYDE COUNCIL – Water Sensitive Urban Design (WSUD) Systems and Interpretive Signs

Stormwater treatment systems have been built by the City of Ryde in Gladesville, Looking Glass Bay, Meadowbank Shops and Meadowbank Park. These include the constructed wetlands adjacent to the Field of Mars Wildlife Reserve, the tree pits and rain-gardens around Meadowbank railway station and a 190m^2 bio-retention basin that reduces stormwater pollutants from entering Looking Glass Bay. The latter for example, is designed to remove 85% of Total Suspended Solids, 74% of Total Phosphorous and 57% of Total Nitrogen from the 1.2 hectare Amiens Street sub-catchment that drains to Looking Glass Bay.

The multi layered filtration systems of the rain-gardens use biological processes in soil media to help regulate its functioning over long periods, with minimal external maintenance requirements.

Several innovative interpretive signs have also been designed with input from local schools to educate residents about the concept of a water catchment, the

WSUD systems and stormwater pollution. Associated bus tours, a teacher professional development session and student workshops helped educate the community about their functioning and purpose.

A draft WSUD Development Control Plan, WSUD guidelines and developer workshops have been developed to inform the city's development control process and share knowledge and tools on WSUD with stakeholders beyond Council's own operations.

5

Climate Change

Climate Change

The earth's atmosphere consists of nitrogen (78.1%) and oxygen (20.9%), with small amounts of argon (0.9%), carbon dioxide (variable, but around 0.035%), water vapour, and other gases. The atmosphere protects life on earth by absorbing ultraviolet solar radiation and reducing temperature extremes between day and night.

The atmosphere regulates the earth's temperature through a phenomenon called the greenhouse effect. However, with an increase in human activity, this effect is being enhanced causing climate change. Climate change can cause severe weather patterns including droughts, floods and severe storms and also climate zone shifts causing polar ice melts and rising sea levels.

There is a widespread acceptance that climate change is occurring and being affected by greenhouse gas emissions, and that this process is set to continue for the near future. Federal, state and local governments are all working to try and reduce greenhouse gas emissions through educational programs and the introduction of energy conservation measures.

NSROC councils measure their CO_2 emissions of their major assets and activities. Generally councils are achieving improvements. An additional 4,000 tonnes of CO_2 have been saved across all council sites compared with 2008/2009. However councils do need to continue to be vigilant on their major asset emissions and look at further CO_2 emission saving opportunities. Councils emissions across sites vary considerably from year to year as new sites come on line and changes in methodologies for CO_2 measurement are adopted in line with changes to State and Federal guidelines.

Table 22: Greenhouse emissions and reduction through council action in the region for the year 2009/2010

Council	Tonnes of Co^2 created by council for top three sites	Tonnes of Co^2 saved through projects for all council assets
North Sydney[1]	3,628	4,277
Lane Cove[2]	2,916	2,002
Hunter's Hill	223	40
Ryde[3]	5,504	2092
Ku-ring-gai[4]	1,754	2,384
Hornsby Shire[5]	1,629	3,204
Willoughby[6]	1,853	4,924
Total for NSROC 2009/10	**17,507**	**18,846**
Total for NSROC 2008/09	10,878	14,219

Notes

1. North Sydney Councils figures includes energy generated by photovoltaic systems and offset through Greenpower purchases
2. Lane Cove assessment provided through Planet Footprint analysis. The 2008/09 figure for Lane Cove was not an annual figure due to data availability at time of publication. The annual figure adjusted for 2008/09 was 2812 tonnes.
3. The City of Ryde figure for the top three sites presently includes the Ryde Aquatic and Leisure Centre (RALC), a major aquatic facility (4226t), the Civic Centre and Operations Centre. This data is sourced directly from all of the energy providers and calculated using a rigorous methodology in accordance with the DCCEE National Greenhouse Factors 2008. The data of the previous SoE report is not comparable due to differing methodology applied. The data for Ryde in Figure 28 complies with the National Greenhouse and Energy Reporting Act 2007.
4. Ku-ring-gai Council has used specific and readily available data for these results. Council's GreenStyle program has not been included in this dataset as accurate data is not yet available.
5. Hornsby Shire Council's GreenStyle program has not been included in this data set as accurate data is not yet available.
6. Willoughby City Council emissions savings includes quantifiable energy efficiency measures, renewable energy production, GreenPower and offsets purchases.

Councils have set targets for CO_2 emission reductions both within the council and for the community. Some of these targets have been revised in the last year following discussions with communities as noted below.

Table 23: Current NSROC Carbon Emission Reduction Targets

Council	Date adopted	Target for council	Date to be achieved	Target for community	Date to be achieved
Willoughby[1] (revised)	2000	50%	1999 – 2010	15%	2007 – 2015
Ryde	2007	30%	2003/2004 – 2012	20%	2001 – 2010
Hunter's Hill	2007	20%	2010	10%	2010
		50%	2025	30%	2025
		100%	2050	60%	2050
Lane Cove	2007	50%	2001 – 2017	50%	2017
North Sydney	2001	50%	1996 – 2020	25%	1996 – 2020
Hornsby (revised)	2009	30%	2020	5%	2010
		35%	2025		
		60%	2050	10%	2050
Ku-ring-gai[2] (revised)	2009	20%	2000 – 2020	10%	No set date

Notes

1. Willoughby endorsed a new community target of a 15% reduction of greenhouse gas emissions associated with electricity consumption based on 2007 levels.
2. Ku-ring-gai's corporate emission reduction target excludes streetlights. The Ku-ring-gai community commits to reducing greenhouse gas emissions by minimising the use of energy derived from fossil fuels.
3. Hornsby's recently revised corporate emissions targets have become more stringent, capping tCO2 emissions regardless of any further assets acquired or changes in staffing and business activities.
4. North Sydney Council adopted the 2020 Vision North Sydney Community Strategic Plan 2009/2020 on 30 November 2009. This plan combined with the Greenhouse Action Plan (2009) extends the targeted timeframe to 2020 while maintaining the existing Council greenhouse gas emission reduction figure of 50% emissions reduction from Council's 1996 baseline to take into account the scheduled expansion of assets and services.

In addition to actions to reduce CO_2 emissions within their communities, NSROC councils are looking at manageing the anticipated impacts of climate change. In general terms global climate change is anticipated to impact in the NSW region in the following ways:

Table 27: Statewide projected impacts of Climate Change

PROJECTED IMPACTS OF CLIMATE CHANGE IN NSW

- New South Wales is expected to become **warmer** with more hot days and less cold nights.
- By 2030 the annual average number of days over 35°C in Sydney could grow from the current 3 to 4-7 days, in Canberra from 5 to 6-12 days and in Cobar from 41 to 45-65 days.
- Growth in **peak summer energy demand** is likely, due to air-conditioning use, which may increase the risk of blackouts.
- Warmer temperatures and population growth are likely to cause a rise in **heat-related illness and death** for those over 65; increasing in Canberra from the current 14 deaths annually to 37-41 by 2020 and 62-92 by 2050. In Sydney increases are projected in annual deaths from the current 176 to 364-417 by 2020 and 717-1,312 by 2050.
- Warmer conditions may also help spread vector-borne, water-borne and food-borne disease further south. These health issues could increase **pressure on medical and hospital services**.
- **Urban water security** may be threatened by projected increases in demand and climate-driven reductions in water supply.
- Little change in annual rainfall and higher evaporation would likely lead to **less runoff in rivers** in many catchments by 2030. Run-off across the Murray-Darling Basin may decrease 10-25 percent by 2050.
- More frequent and severe droughts, with **greater fire risk**, are likely.
- By 2020 the annual number of days with very high or extreme fire danger could average 13-14 in Richmond (now 11.5), 26-29 in Canberra (now 23) and 53-57 in Wagga Wagga (now 50).
- By 2020 a 10-40 percent reduction in **snow cover** is likely with potentially significant consequences for alpine tourism and ecosystems.
- Some agricultural crops may benefit from higher CO_2 concentrations however protein content is likely to decline.
- Frost-sensitive crops, such as wheat, may respond well to some warming however more hot days and less rainfall may **reduce yields**.
- Adverse effects for agriculture include reduced stone fruit yields in warmer winters, livestock stress and an increased prevalence of **plant diseases, weeds and pests**.
- CO^2 benefits experienced by forestry may be offset by a decline in rainfall, more bushfires and changes in pests. Centres **dependent upon agriculture and forestry** may be adversely affected.
- Increases in **extreme storm events** are expected to cause more flash flooding affecting industry and infrastructure, including water, sewerage and stormwater, transport and communications, and may challenge emergency services.
- In **coastal areas infrastructure** is vulnerable to sea level rise and inundation.

Source: Commonwealth Department of Climate Change Website – www.climatechange.gov.au/climate-change/impacts/national-impacts/nsw-impacts.aspx

The 2008/2009 NSROC SoE Report reported on Hornsby Shire Council's "Climate Change Adaptation Strategic Plan". In 2009/2010 Ku-ring-gai has developed its draft "Climate Change Adaptation Strategy" which identifies the risks associated with these changes at a local level.

For example Council's are likely to have:

- greater demands on their emergency response systems associated with increased extreme weather events;
- additional pressures and loads on stormwater infrastructure associated with increased rainfall, flooding and sea and harbour level rises and storm surges; and
- planning restrictions and variations in development requirements for sites identified as vulnerable.

Each NSROC council is continuing to investigate the impacts of climate change and developing response strategies.

CASE STUDY

KU-RING-GAI COUNCIL – Draft Climate Change Adaptation Strategy

The draft Climate Change Adaptation Strategy covers various adaptation options that were scoped through an inclusive consultation process involving staff across the organisation, local experts from various emergency services organisations, business, state government departments, community members and academics. The individual and collective opinions have guided the assessment of vulnerability and resilience factors and assisted in determining the scope and rank of the adaptation options.

To further investigate the financial cost/benefit of the more complex issues, particularly relevant to higher level investment options a collaboration was formed with Macquarie and Bond Universities to establish a method to provide this information.

The collaborative research project was also valuable as it provided staff with the knowledge and expertise to determine the ranking of options and whether they were financially feasible in offsetting the costs of inaction. It also validated a means of using expert opinion to enhance existing data where there is a paucity of data available which is the case in estimating the costs associated with extreme weather events mainly because there have been too few events where good records have been maintained.

The result of this research and as contained in the draft strategy is a suite of ranked adaptation options available for decision makers to examine for their cost benefit. It should be noted the cost benefit analysis method arising from the collaborative research project is not the traditional form of cost benefit but rather a more sustainable cost benefit assessment that factors in costs in terms of financial, social and environmental impacts and benefits in terms of risk reduction capability.

These options have been assigned to a lead agency or stakeholder as having the primary responsibility with those having secondary responsibilities also identified. For Council this will enable the integration of actions with the delivery and operational plan.

CASE STUDY

HUNTER'S HILL COUNCIL – Low Carbon Asphalt

There is increasing pressure on society to be more aware of how our activities may impact on the welfare of future generations. To this end we need to focus on ways of developing more sustainable practices so that we can preserve our scarce resources through optimising recycling and protecting our environment. The engineering staff at Hunter's Hill Council are committed to applying these philosophies and recently decided to utilise a new product called LoCarb asphalt from Boral in their efforts to implement more sustainability measures in their road rehabilitation program. Hunter's Hill Council is the second council in NSW to use this new product.

LoCarb is made using a new technology called warm mix asphalt, which is aimed at reducing our carbon footprint and supporting principles of sustainability in roadworks. In June 2010, Hunter's Hill Council applied this technology in resurfacing Franki Avenue a residential street and prominent access road opposite the small commercial strip in Woolwich.

The main objective of warm mix asphalt is to reduce the temperature at which asphalt is produced. In doing so, the amount of fuel burned in production is reduced and the lower temperature means that greenhouse gas emissions are also reduced. Usually, asphalt is produced at high temperatures to assist with placement and compaction of the material on the road. The advantage of this new technology is that special additives are used in the manufacturing process to allow asphalt to be placed and compacted at lower temperatures. Typically, warm mixed asphalt can now be produced and placed at a temperature of 30°C less than conventional hot mixed asphalt. This results in a significant reduction of around 27% in the amount of greenhouse gas emissions. This technology also supports the use of recycled asphalt from old pavements thereby ensuring that our raw materials are preserved and used in a more sustainable manner.

From the tests that have been completed both here and overseas over almost a decade it has been established that warm mix asphalt behaves the same if not better than hot mix asphalt. By using LoCarb in Franki Avenue, Hunter's Hill engineering staff have demonstrated their commitment towards achieving a more carbon neutral solution for council's residents and thus contributing to the aspirations of a greener planet. The performance of LoCarb asphalt will continue to be monitored by the engineering staff and the information gathered will be used to decide on where to place it next.

With a saving of 27% in carbon emissions the calculated saving for this projects are as follows.

- 0.27 x 34 kg = 9 kg of CO_2 for 1 tonne of asphalt.
- 41.06 tonnes of LoCarb asphalt was used at Hunter's Hill
- 9.9 kg of CO_2 x 41.06 = 369.54 emission reduction of CO_2

AIR QUALITY

As population density in the NSROC region rises, the incidence of vehicle usage will increase, with the potential of creating more frequent high pollution days. Natural processes can also increase high pollution days, with higher air-pollution levels across Sydney being more likely to occur on cooler, clearer nights. This is because temperature inversions restrain pollution from dispersing.

The key air quality and health issue in the NSROC region is traffic related air pollution. Air pollution measurement across NSROC region is not comprehensive with only one permanent state-funded regional air quality monitoring station in the NSROC region at Lindfield. Furthermore the links between pollution levels and community health are subject to debate and continuous research. Nevertheless NSROC councils recognise this is a community concern and maintain awareness of pollutant levels.

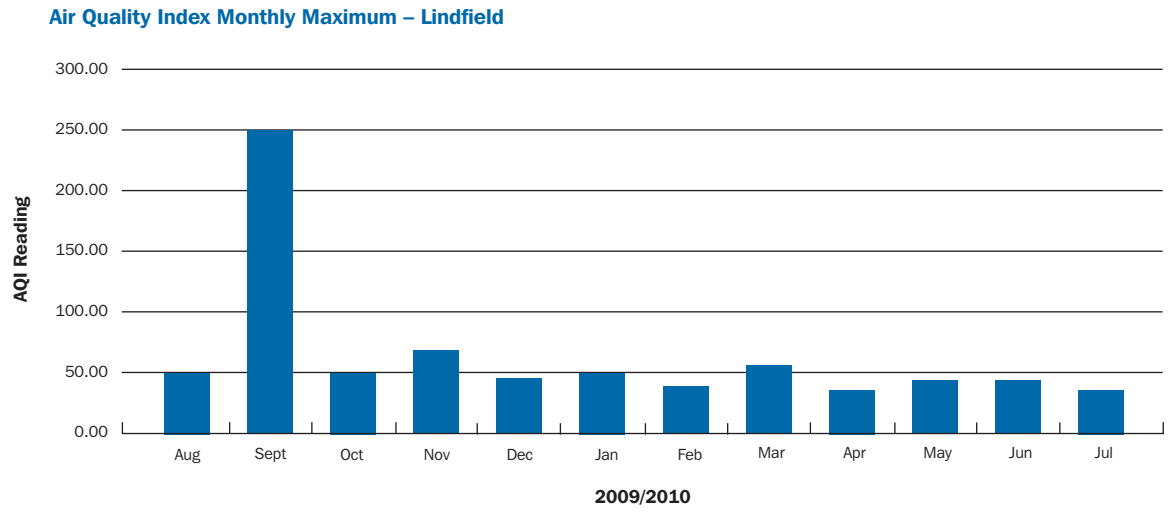
The 2009/2009 NSROC SoE report noted the air quality measurement activities of some NSROC councils. The figure below charts the average of maximum Air Quality Index (AQI) readings for the regional state government funded site at Lindfield from August 2009 to July 2010. The AQI is a derived value (based on the various data readings). The data readings are recorded in different units of measure, depending on the type of pollutant:

Pollutant	Units used for air quality data
Ozone	pphm (parts pre hundred million)
Nitrogen dioxide	pphm (parts per hundred million)
Visibility (as Bsp)	10-4 m-1
Carbon monoxide	ppm (parts per million)
Sulfur dioxide	pphm (parts per hundred million)
Particles	µg/m3 (micrograms per cubic metre)

Because data readings have different underlying units of measure, it is difficult to compare the various pollutants. The AQI uses a formula to standardize these set of values that they can be compared and presented.

It can be seen, with the exception of 29 September 2009 when severe dust storms affected Sydney (affecting the September average), that the air quality index readings are relatively constant for 2009/2010 as measured by the regional air quality station in Lindfield.

Figure 7: Air Quality Index – Lindfield



6 Landscape

Landscape

The forests, woodlands, grasslands and other vegetated landscapes of New South Wales are important for a healthy environment and society. Native vegetation controls erosion, land degradation and discharge of salinity into rivers, and provides habitat for a wealth of unique flora and fauna. In addition, the vast amount of carbon stored in native vegetation makes a significant contribution to moderating climate change. *(DECCW 2008 – NSW Annual Report on Native Vegetation)*

The landscape in the Northern Sydney region varies from highly urbanised environments to relatively undisturbed tracts of native bushland. It includes coastal estuaries, escarpments, steep ridgelines and farmed rural lands. The landscape has been undeniably altered through the process of human settlement and this change has accelerated from the period of European settlement until the present day through land clearing, urban development and consolidation.

Because of the steep inclines, gullies and undulating terrain of the NSROC region, and the presence of many natural water bodies contiguous to this terrain, the region is particularly vulnerable to accelerated erosion, nutrient run-off, flooding, sedimentation and the associated decrease in water quality. Native bushland has an important ecological role in binding soil matter, maintaining infiltration, absorbing water and greenhouse gas sequestration.

Councils continue to work actively to minimise erosion impacts through a mixture of land-use planning, development controls, water-management practices, education and regulatory enforcement. Because of the region's variable terrain and abundance of natural water courses and water bodies, particular care is taken in zoning land for development to ensure erosion and erosion-related impacts do not significantly affect the environment. Where major development occurs, the use of sediment and erosion controls are required with controls specified on development consents and enforced by council's regulatory officers or rangers.

The NSROC councils have introduced a number of development controls to reduce the impact on the local waterways, including requiring and enforcing the use of sediment controls on building sites, setting maximum site-coverage limits, and promoting the installation of rainwater tanks or the provision of storage to delay the release of stormwater. Councils have also been rehabilitating areas where stormwater drains enter creeks and providing rock armouring to reduce erosion potential. They also ensure appropriate controls around sites on public land where soil is disturbed, planting steeply graded banks and surfaces to retain soil integrity and managing storm water flows to minimise channelling and run-off impacts.

Most NSROC councils have information readily available for the management of soil erosion caused by construction, and work closely with the construction industry in an educational and regulatory role. In some cases, this information is provided directly with development consents which include specific erosion mitigation measures. The councils continue to develop educational materials and investigate new engineering solutions to address this ongoing issue.

In the 2008/2009 Regional SoE Report the number of declared sites in the NSROC region was identified and any related action or programs outlined.

MAPPING INITIATIVES

Several new mapping initiatives are being undertaken in the NSROC region.

Hornsby, North Sydney and Willoughby City Councils are members of the Sydney Coastal Councils Group (SCCG). The SCCG was originally formed to focus on beach pollution but now focuses more broadly on coastal management issues. It includes 15 councils along the Sydney Coastal area.

In 2008 the SCCG undertook a project to identify and map the vulnerability of each member council to climate change against a set of five potential areas of concern. These included:

- extreme heat and human health effects
- sea level rise and coast hazards
- extreme rainfall and stormwater management
- bushfire; and
- natural ecosystems and assets.

Each aspect was separately mapped and can be found in detail in the SCCG report "Mapping Climate Change Vulnerability in the Sydney Coastal Councils Group" at www.sydneycoastalcouncils.com.au

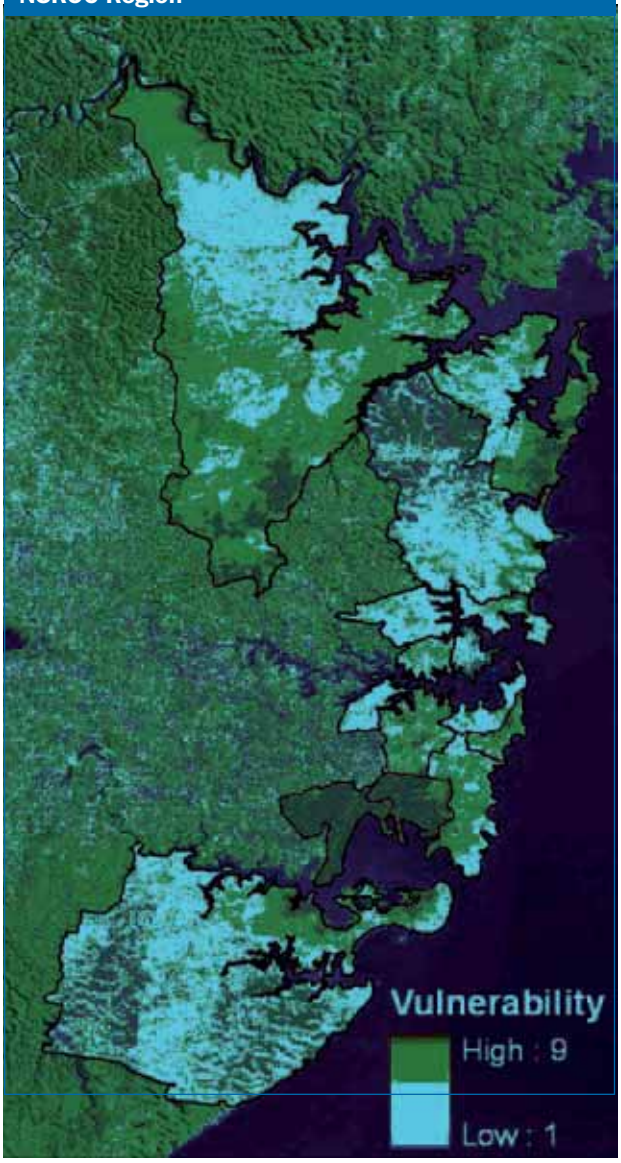
For NSROC member councils the vulnerability values were assessed on the following basis that high values indicate a relatively high degree of vulnerability to future climate change while low values indicate low vulnerability. Degrees of vulnerability:

- low vulnerability associated with scores of 1 to 3,
- moderate vulnerability with scores of 4 to 6, and
- high vulnerability with scores of 7 to 9.

Table 24: Climate Change Vulnerability Scores for selected NSROC Councils

Council	Impact Area					
	Extreme Heat	Sea Level Rise	Extreme Rain	Bushfire	Ecosystems	Net
Hornsby Shire	6	1	4	7	4	5
North Sydney	7	2	9	1	8	7
Willoughby	7	1	7	2	7	6

Figure 8: Overall (Aggregated) Vulnerability of the NSROC Region



The SCCG also provided mapped summaries of these assessments. The overall vulnerability of the SCCG region to climate change, based upon the vulnerability layers for the five impact areas is illustrated in Figure 34. High values indicate a relatively high degree of vulnerability to future climate change while low values indicate low vulnerability.

In 2010 the SCCG is continuing its work on mapping and responding to impacts associated with climate change. NSROC will look at possible joint activities with SCCG to examine estuary inundation impacts and mapping of the vulnerability of other NSROC member councils not currently in SCCG.

7 Appendices

Appendices

APPENDIX 1: List of threatened species in the NSROC region from the Atlas of NSW Wildlife (2009)

APPENDIX 1: List of threatened species in the NSROC region from the Atlas of NSW Wildlife (2009)

Key:

The Atlas of NSW Wildlife is the NSW Department of Environment and Conservation's database of fauna and flora records. The following lists include entries in the Atlas marked as:

V – Vulnerable (Threatened Species Conservation Act, 1995)
E1 – Endangered (Threatened Species Conservation Act, 1995)
E2 – Endangered (Threatened Species Conservation Act, 1995)
E4A – Critically endangered (Threatened Species Conservation Act, 1995)

The Atlas states that data it contains, while extensive, is by definition patchy. It will not provide full distribution of a species. Except in areas where comprehensive survey information has been incorporated into the database, the search results for a particular area are based on a mix of reported sightings.

LGA – Hornsby Fauna threatened species – total 37 species (8 endangered)		
Scientific Name	**Common Name**	**Legal Status**
Pandion haliaetus	Osprey	**V**
Ixobrychus flavicollis	Black Bittern	**V**
Callocephalon fimbriatum	Gang Gang Cockatoo Population, Hornsby & Ku-ring-gai LGAs	**E2**
Calyptorhynchus lathami	Glossy Black-Cockatoo	**V**
Climacteris picumnus	Brown Treecreeper	**V**
Ptilinopus superbus	Superb Fruit-Dove	**V**
Stagonopleura guttata	Diamond Firetail	**V**
Falco hypoleucos	Grey Falcon	**V**
Xanthomyza phrygia	Regent Honeyeater	**E1**
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subsp.)	**V**
Macronectes giganteus	Southern Giant-Petrel	**E1**
Neophema pulchella	Turquoise Parrot	**V**
Glossopsitta pusilla	Little Lorikeet	**V**
Lathamus discolor	Swift Parrot	**E1**
Ninox connivens	Barking Owl	**V**
Ninox strenua	Powerful Owl	**V**
Tyto novaehollandiae	Masked Owl	**V**
Tyto tenebricosa	Sooty Owl	**V**
Litoria aurea	Green and Golden Bell Frog	**E1**
Heleioporus australiacus	Giant Burrowing Frog	**V**
Pseudophryne australis	Red-crowned Toadlet	**V**
Eubalaena australis	Southern Right Whale	**V**
Cercartetus nanus	Eastern Pygmy-possum	**V**
Dasyurus maculatus	Spotted-tailed Quoll	**V**
Dugong dugon	Dugong	**E1**
Mormopterus norfolkensis	Eastern Freetail-bat	**V**
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	**E1**
Phascolarctos cinereus	Koala	**V**
Phascolarctos cinereus	Koala in the Pittwater LGA	**E2**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**
Chalinolobus dwyeri	Large eared Pipe Bat	**V**
Falsistrellus tasmaniensis	Eastern Dalse Pipstrelle	**V**
Myotis macropus	Southern Myotis	**V**
Dermochelys coriacea	Leathery Turtle	**V**
Varanus rosenbergi	Rosenberg's Goanna	**V**

LGA – Hornsby Flora threatened species (43 species – 17 endangered)		
Scientific Name	**Common Name**	**Legal Status**
Olearia cordata		**V**
Epacris purpurascens var. purpurascens		**V**
Acacia bynoeana	Bynoe's Wattle	**E1**
Acacia gordonii		**E1**
Grammitis stenophylla	Narrow leaf Finger Fern	**E1**
Haloragis exalata		**V**
Haloragis exalata subsp. exalata		**V**
Pilularia novae-hollandiae	Austral Pillwort	**E1**
Callistemon linearifolius	Netted Bottle Brush	**V**
Darwinia biflora		**V**
Darwinia fascicularis subsp. oligantha	Darwinia fascicularis subsp. oligantha population in the Baulkham Hills and Hornsby Local Government Areas	**E2**
Darwinia peduncularis		**V**
Eucalyptus camfieldii	Heart-leaved Stringybark	**V**
Eucalyptus scoparia	Wallagarra White gum	**E1**
Kunzea rupestris		**V**
Leptospermum deanei		**V**
Melaleuca deanei		**V**
Micromyrtus blakelyi		**V**
Syzygium paniculatum	Magenta Lilly Pilly	**V**
Caladenia tessellata	Thick Lip Spider Orchid	**E1**
Genoplesium baueri	Bauer's Midge Orchid	**V**
Ancistrachne maidenii		**V**
Grevillea parviflora		**V**
Grevillea parviflora subsp. supplicans		**E1**
Persoonia hirsuta		**E1**
Persoonia mollis subsp. maxima		**E1**
Galium australe	Tangled Bedstraw	**E1**
Asterolasia elegans		**E1**
Zieria involucrata		**E1**
Lasiopetalum joyceae		**V**
Pimelea curviflora var. curviflora		**V**
Tetratheca glandulosa		**V**
Acacia terminalis subsp. terminalis	Sunshine Wattle	**E1**
Haloragodendron lucasii		**E1**
Prostanthera junonis	Somersby Mintbush	**E1**
Eucalyptus nicolli	Narrow leafed Black Peppermint	**V**
Melaleuca bicovexa	Biconvex Paperbark	**V**
Grevillea shirressi		**V**
Genoplesium plumosum	Tallong Midge Orchid	**E4A**
Pterostylis nigricans	Dark Greenwood	**V**

LGA – Hunter's Hill Fauna threatened species – 5 species		
Scientific Name	**Common Name**	**Legal Status**
Ninox connivens	Barking Owl	**V**
Ninox strenua	Powerful Owl	**V**
Pseudophryne australis	Red-crowned Toadlet	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**

LGA – Hunter's Hill Flora threatened species – 4 species		
Scientific Name	**Common Name**	**Legal Status**
Darwinia biflora		**V**
Genoplesium baueri	Bauer's Midge Orchid	**V**
Eucalyptus nicolli	Narrow leafed Black Peppermint	**V**
Epacris purpurascens var purpurascens		**V**

LGA – Hornsby Flora threatened species (43 species – 17 endangered)		
Scientific Name	**Common Name**	**Legal Status**
Nettapus coromandelianus	Cotton Pygmy-Goose	**E1**
Botaurus poiciloptilus	Australasian Bittern	**V**
Callocephalon fimbriatum	Gang Gang Cockatoo Population, Hornsby & Ku-ring-gai LGAs	**E2**
Calyptorhynchus lathami	Glossy Black-Cockatoo	**V**
Ptilinopus superbus	Superb Fruit-Dove	**V**
Haematopus fuliginosus	Sooty Oystercatcher	**V**
Haematopus longirostris	Pied Oystercatcher	**V**
Xanthomyza phrygia	Regent Honeyeater	**E1**
Lathamus discolor	Swift Parrot	**E1**
Polytelis swainsonii	Superb Parrot	**V**
Limicola falcinellus	Broad-billed Sandpiper	**V**
Ninox connivens	Barking Owl	**V**
Ninox strenua	Powerful Owl	**V**
Litoria aurea	Green and Golden Bell Frog	**E1**
Heleioporus australiacus	Giant Burrowing Frog	**V**
Pseudophryne australis	Red-crowned Toadlet	**V**
Cercartetus nanus	Eastern Pygmy-possum	**V**
Dasyurus maculatus	Spotted-tailed Quoll	**V**
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	**V**
Mormopterus norfolkensis	Eastern Freetail-bat	**V**
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	**E1**
Phascolarctos cinereus	Koala	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Chalinolobus dwyeri	Large-eared Pied Bat	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**
Dermochelys coriacea	Leathery Turtle	**V**
Varanus rosenbergi	Rosenberg's Goanna	**V**
Glossopsitta Pusilla	Little Lorikeet	**V**

LGA – Ku-ring-gai Flora threatened species – 18 species – 8 endangered		
Scientific Name	**Common Name**	**Legal Status**
Epacris purpurascens var. purpurascens		**V**
Acacia bynoeana	Bynoe's Wattle	**E1**
Grammitis stenophylla		**E1**
Haloragodendron lucasii		**E1**
Darwinia biflora		**V**
Eucalyptus camfieldii	Heart-leaved Stringybark	**V**
Melaleuca deanei		**V**
Syzygium paniculatum		**V**
Deyeuxia appressa		**E1**
Persoonia mollis subsp. maxima		**E1**
Tetratheca glandulosa		**V**
Leptospermuim deanei		**V**
Genoplesium plumosum	Tallong Midge Orchid	**E4A**
Genoplesium baueri	Bauer's Midge Orchid	**V**
Cryptostylis hunterariani	Leafless Tongue Orchid	**V**
Grevillea caleyi	Caley's Grevillea	**E1**
Persoona hirsute subs hirsuta		**E1**
Lasiopetalum joyceae		**V**

LGA – Lane Cove Fauna threatened species – 8 species – 2 endangered		
Scientific Name	**Common Name**	**Legal Status**
Ptilinopus superbus	Superb Fruit-Dove	**V**
Xanthomyza phrygia	Regent Honeyeater	**E1**
Ninox strenua	Powerful Owl	**V**
Litoria aurea	Green and Golden Bell Frog	**E1**
Cercartetus nanus	Eastern Pygmy-possum	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Glossopsitta Pusilla	Little Lorikeet	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**

LGA – Lane Cove Flora threatened species – 19 species – 7 endangered		
Scientific Name	**Common Name**	**Legal Status**
Camarophyllopsis kearneyi		**E1**
Hygrocybe anomala var. ianthinomarginata		**V**
Hygrocybe aurantipes		**V**
Hygrocybe austropratensis		**E1**
Hygrocybe collucera		**E1**
Hygrocybe griseoramosa		**E1**
Hygrocybe lanecovensis		**E1**
Hygrocybe reesiae		**V**
Hygrocybe rubronivea		**V**
Melaleuca deanei		**V**
Syzygium paniculatum	Magenta Lilly Pilly	**V**
Genoplesium baueri	Bauer's Midge Orchid	**V**
Persoona hirsute subs hirsuta		**E1**
Acacia terminalis subsp. terminalis	Sunshine Wattle	**E1**
Callistemon linearifolius	Netted Bottle Brush	**V**
Darwinia Bioflora		**V**
Eucalyptus nicolli	Narrow leafed Black Peppermint	**V**
Leptospermum deanei		**V**
Pimelea curviflora var curviflora		**V**

LGA – North Sydney Fauna threatened species		
Scientific Name	**Common Name**	**Legal Status**
Burhinus grallarius	Bush Stone-curlew	**E1**
Ptilinopus superbus	Superb Fruit-Dove	**V**
Ninox strenua	Powerful Owl	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**

LGA – North Sydney Flora threatened species		
Scientific Name	**Common Name**	**Legal Status**
Acacia terminalis subsp. terminalis	Sunshine Wattle	**E1**

LGA – Ryde Fauna threatened species – 13 species – 4 endangered		
Scientific Name	**Common Name**	**Legal Status**
Pandion haliaetus	Osprey	**V**
Ixobrychus flavicollis	Black Bittern	**V**
Callocephalon fimbriatum	Gang Gang Cockatoo Population, Hornsby & Ku-ring-gai LGAs	**E2**
Limosa limosa	Black-tailed Godwit	**V**
Ninox strenua	Powerful Owl	**V**
Litoria aurea	Green and Golden Bell Frog	**E1**
Pseudophryne australis	Red-crowned Toadlet	**V**
Petaurus australis	Yellow-bellied Glider	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	**V**
Ephippiorhynchus asiaticus	Black Necked Stork	**E1**
Xanthomyza phrygia	Regent Honeyeater	**E1**

LGA – Ryde Flora threatened species – 13 species – 3 endangered		
Scientific Name	**Common Name**	**Legal Status**
Epacris purpurascens var. purpurascens		**V**
Callistemon linearifolius	Netted bottle Brush	**V**
Darwinia biflora		**V**
Leptospermum deanei		**V**
Melaleuca deanei		**V**
Tetratheca glandulosa		**V**
Eucalyptus nicolli	Narrow leafed Black Peppermint	**V**
Pimelea curviflora var curviflora		**V**
Genoplesium baueri	Bauer's Midge Orchid	**V**
Wilsonia backhousie	Narrow leafed Wlisonia	**V**
Grammitis stenphylla	Narrow leafed Finger Fern	**E1**
Prosanthera marifolia		**E4A**
Persononia hirsute subsp. hirsute/evoluta		**E1**

LGA – Willoughby Fauna threatened species – 7 species – 1 endangered		
Scientific Name	**Common Name**	**Legal Status**
Ptilinopus superbus	Superb Fruit-Dove	**V**
Xanthomyza phrygia	Regent Honeyeater	**E1**
Ninox strenua	Powerful Owl	**V**
Pseudophryne australis	Red-crowned Toadlet	**V**
Cercartetus nanus	Eastern Pygmy-possum	**V**
Dasyurus maculatus	Spotted-tailed Quoll	**V**
Pteropus poliocephalus	Grey-headed Flying-fox	**V**

LGA – Willoughby Flora threatened species – 11 species – 4 endangered		
Scientific Name	**Common Name**	**Legal Status**
Acacia bynoeana	Bynoe's Wattle	E1
Eucalyptus camfieldii	Heart-leaved Stringybark	V
Caladenia tessellata	Thick Lip Spider Orchid	E1
Tetratheca glandulosa		V
Melaleuca deanei	Dean's paperbark	V
Syzygium paniculatum	Magenta Lilly Pilly	V
Grevillea caleyi	Caley's Grevillea	E1
Epacris purpurascens var purpurascene		V
Prostanthera marifolia		E4A
Lasiopetalum joyceae		
Sarcochilus hartmannii	Hartman's Sarcochilus	

Hunter's Hill, Hornsby Shire, Ku-ring-gai, Lane Cove, North Sydney, City of Ryde and Willoughby City Councils

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