

Annual Report

2007 - 2008

Part B: State of the Environment Report

PORT MACQUARIE
HASTINGS

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Port Macquarie-Hastings at a Glance

The Port Macquarie-Hastings local government area (LGA) lies within the North Coast Region of New South Wales. The North Coast Region is the most biologically diverse area in NSW (Native Vegetation Advisory Council of NSW, 1999). It is also one of the fastest growing regions in NSW.

The LGA covers an area of 3,693 sq km and is located 420 kilometres north of Sydney and 510 kilometres south of Brisbane. The Pacific Highway and the North Coast Rail Line bisect the area north to south and the Oxley Highway bisects the are east to west. State Forests and National Parks occupy a large proportion of the area.

The Pacific Ocean in the east, with a coastline of some 84 kilometres and the Great Dividing Range in the west, provide the natural boundaries to the area. The northern boundary is shared with the Kempsey Shire and runs from Point Plomer on the coast west to the Great Divide. The southern boundary is shared with the City of Greater Taree and commences at Diamond Head on the coast and again runs west to the hinterland. The western boundary is shared with the Walcha Shire Council area. The area has two main river systems, the Hastings and Camden Haven Rivers.

The topography of the area is diverse ranging from sand dunes, coastal wetlands, flood plains and rugged mountain regions. The area is known for having an ideal temperate climate, with the maximum daily temperatures rarely going above 30°C or below 15°C.

The 2006 population for the Port Macquarie-Hastings LGA was 71,284 persons, and is anticipated to grow to 97,800 by the year 2021. The Port Macquarie-Hastings area experienced a growth rate of 1.7% between 2001 & 2006. This is higher than the state average of 1.3% (ABS, 2006) for the coastal regions of NSW (excluding metropolitan areas) (DECC, 2006). Population growth in the Port Macquarie-Hastings continues to be amongst the highest growth rates in regional NSW.

The area has many small localities and villages in addition to three main townships. Situated on the coast, Port Macquarie is the largest town with a population of about 42,200 people and serves as a major tourist destination in addition to being the major regional centre for the area.

The township of Wauchope, 21 kilometres or 20 minutes by car from Port Macquarie, serves as the centre for the inland area, particularly for the rural communities and the associated agricultural industries. Wauchope has a population of about 6,000 people.

The villages of Lake Cathie and Bonny Hills maximise the natural attributes of their location. The population of the area is approximately 5,600 and is growing rapidly.

The Camden Haven is located in the south of the LGA, population approximately 8,800 and includes the towns of Kendall, Kew, North Haven, West Haven, Dunbogan and Laurieton. It is mainly a retirement area and tourist destination, with Laurieton as the main service centre.

Smaller rural population centres and surrounding villages include the Comboyne Plateau (Comboyne, Comboyne West) and Rural Villages (Beechwood, Ellenborough, Long Flat, Pappinbarra, Hollisdale, Upper Pappinbarra, Bellangry, Pembrooke, Ballengarra, Rollands Plains, Upper Rollands Plains, Telegraph Point). The rural population of the LGA is about 9,400 persons.

About SoE 2007-2008

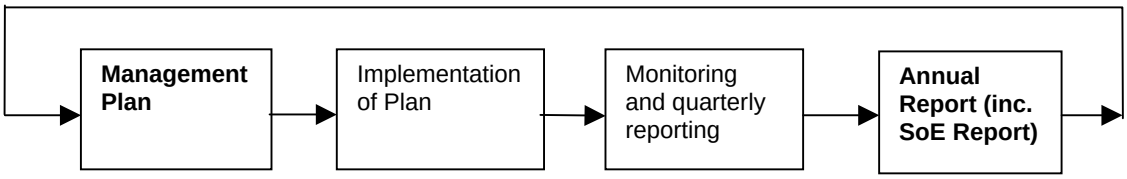
Purpose

The Port Macquarie-Hastings Council State of the Environment Report (SoE) 2007-2008 reports on the status of the main environmental issues facing the Port Macquarie-Hastings local government area. The report addresses eight environmental sectors – land, air, water, biodiversity, waste, noise, Aboriginal heritage and non-Aboriginal heritage.

The Local Government Act 1993 requires Council to prepare a *comprehensive* SoE the year ending after each election of the council, and a *supplementary* SoE report must be prepared in intervening years.

The SoE Report forms part of Council's Annual Report and is an important component of the Management Plan preparation and decision making process. The role of SoE reporting is depicted below.

Management Planning and Annual Reporting Cycle



The Report

The 2007-2008 SoE Report is a ***supplementary*** report. A supplementary must identify any new environmental impacts since the Council's last SoE report and update the trends in environmental indicators that are important to each environmental sector. This report has been structured under the following headings:

- Toward Environmental Sustainability
- Human Settlement
- Atmosphere
- Land
- Water
- Biodiversity

The report aims to present information in a simple form and should be read in conjunction with the comprehensive Hastings SoE Report 2003-2004.

Tables showing indicator data attempt to provide data from previous *comprehensive* reporting years, 1998/99 and 2003/04, and updated data for the 2007/08 year. Graphical data displays are based upon the entire data set relevant to that indicator.

It is suggested that users of this report also refer to the New South Wales State of the Environment Report to put local issues into the state-wide context. The New South Wales State of the Environment 2006 Report can be accessed via the internet at http://www.environment.nsw.gov.au/soe

Chapter 1 – Towards Environmental Sustainability

1.0 Assessing Progress

An inherent purpose of State of the Environment reporting is to enable the assessment of progress towards ecological sustainability and focus strategies and actions required to improve environmental performance and ecological systems. This chapter attempts to provide a 'snap-shot' of Port Macquarie-Hastings Council's progress toward ecological sustainability on the basis of the data presented in this report.

The Port Macquarie-Hastings is progressing towards ecological sustainability in a number of areas. Examples of specific areas include:

- Waste reduction and recycling
- Waste water reuse
- Water supply demand management
- Heritage conservation and awareness
- Acid sulfate soils remediation
- Strategic land use planning

The following key strategies will require continued support:

- Hastings Drought Management Plan
- Hastings & Camden Haven Reclaimed Water Project
- Resources Efficiency and Sustainability Strategy 2007 (Waste)
- Hastings Effluent Management Strategy 1998
- Urban Growth Strategies
- Camden Haven Urban Growth Strategy 2003
- Greenhouse Action Strategy 2003
- Environmental Restoration Programs
- Estuary Management Plans
- Hastings Urban Stormwater Management Plan 2000
- Regional and Local Cycleway Plans

Table 1.1 draws together specific issues identified in this Report as requiring action to ensure that the Port Macquarie-Hastings LGA stays on the road towards ecological sustainability. These issues have been identified on the basis that:

- Indicator data reveals increasing levels of environmental pressure; and/or
- Indicator data reveals inadequate outcomes are being achieved; and/or
- The level or adequacy of responses currently being implemented.

Table 1.1 – Priority Issues for Council's Management Plan

Issue	Recommended Response
Human Settlement	
Population growth	Identify critical constraints to green field and infill development sites within the LGA.
Wastewater Management	Implementation of Village Sewerage Schemes
	Increased monitoring of on-site sewage management systems
Atmosphere	
Global Warming & Energy Consumption	Increase the use of renewable energy in Council facilities, fleet and plant
Urban Air Quality	Strategically plan for effective Public Transport Systems
Land	
Land use	Increased enforcement of erosion and sediment controls on construction sites
Water	
Water Quality & Riverine Ecosystem Health	Investigate more holistic water quality and riverine health assessment techniques
	Increased emphasis and funding for best practise maintenance of gravel roads
Biodiversity	
Terrestrial Ecosystems & Species Diversity	Increase funding for terrestrial ecosystem rehabilitation projects and the implementation of Council's Bushland Open Space Management Plan
	Development of a Biodiversity Strategy
	Implement strategic planning controls to manage and protect koala populations
Native Vegetation Clearing	Transfer private property tree management from Tree Preservation to development consent regulatory framework
Introduced Species	Increased funding for Weed Control Programs on private and public land
	Increase of Feral Animal control activity

The issues identified in Table 1.1 have been reviewed by Council and will be incorporated into future Management Plans.

1.1 Community Involvement in Environmental Monitoring

The community plays an important role in environmental management and monitoring. In recognition of this role, this report draws on data from various community groups and provides information on community activities in managing, restoring and monitoring the local environment. The information is not exhaustive in this respect, but aims to highlight particular issues associated with community involvement and recognise its importance.

In the 2007-2008 Report, reference is made to a number of community groups and their activities including:

- Landcare groups throughout the area
- Local schools
- The Koala Preservation Society
- Local oyster growing industries
- Hastings Valley Conservation Hunting Group

Chapter 2 – Human Settlement

2.1 Population and Settlement Patterns

Trends

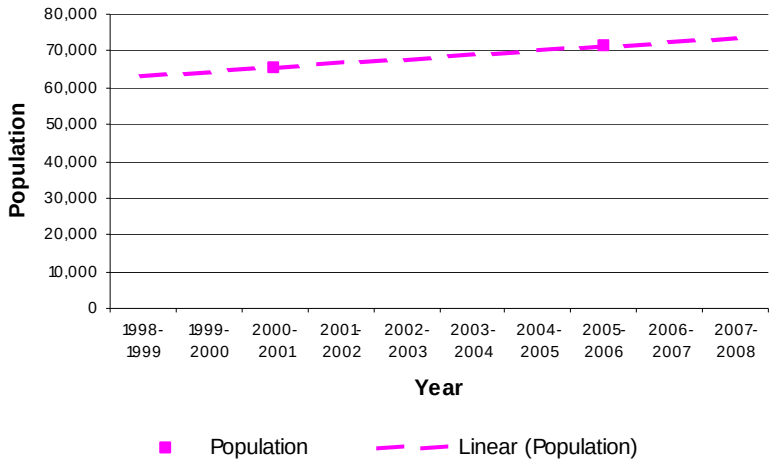
The 2006 Census (ABS) identified the total resident population for the Port Macquarie-Hastings LGA 71,284. The data, presented as Figure 2.2.1, shows the population growth trend for the LGA using the 2001 and 2006 Census figures.

The coastal regions of NSW (excluding metropolitan areas) experienced a 1.3% growth between 2001 & 2005 (DECC, 2006)

The Port Macquarie-Hastings area experienced a growth rate of 1.7% between 2001 & 2006. This is higher than the state average of 1.3% (ABS, 2006) for the coastal regions of NSW (excluding metropolitan areas) (DECC, 2006). Population growth in the Port Macquarie-Hastings continues to be amongst the highest growth rates in regional NSW.

Further detailed information on the population and demographics of the Port Macquarie-Hastings can be found in the Community Profile on Council's website at www.pmhc.nsw.gov.au

Figure 2.1.1 – Port Macquarie-Hastings LGA Population Growth



Pressures on the environment and our natural resources are driven by population growth and the demand it creates. The trend line shown in the above graphic is used extensively in this report to relate trends in other indicator data to population increase.

Responses

Council and government are strategically planning for sustainable population growth. A number of strategic planning, infrastructure and management strategies are being implemented to cater for sustainable population growth in the Port Macquarie-Hastings LGA including:

- Hastings Urban Growth Strategy
- Camden Haven Urban Growth Strategy

- Wauchope Urban Growth Strategy
- Rural Residential Growth Strategy
- Hastings Effluent Management Strategy
- Hastings Drought Management Plan
- Resources Efficiency and Sustainability Strategy 2007 (Waste)
- Hastings Effluent Management Strategy 1998

In addition to broader strategies, Council is currently preparing detailed plans to ensure sustainable growth in the major urban expansion areas at Lake Cathie/Bonny Hills (now known as Ngamba) and Thrumster (west of Port Macquarie).

Despite the above, the long-term capacity of the LGA to sustain population growth needs to be studied. To address this need, the NSW Department of Planning has completed the draft Mid North Coast Regional Plan. This initiative identifies both current and potential future urban investigation areas for residential, industrial and commercial development and sets targets for development and settlement on a regional basis. This work is supported by Council's existing strategic planning work and will be strengthened by a revised Landuse Strategy that is being developed by Council.

2.2 Urban Water

Trends

Table 2.2.1 – Indicators for Urban Water

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	Potable water usage per property (KL)	248	230	186
Pressure	Annual per capita potable water use (KL)*	86	84	81
Pressure	Annual volume of water used for potable purposes (ML)	5,336	5,839	5,338
Response	Volume Treated effluent reused (ML)	26	249	265
Pressure	Number of water restriction breaches reported to Council	New Indicator	92	65

* Per capita data based on total LGA population for consistency of annual figure

A continued reduction in demand caused by consumer education, mandatory water conservation measures and the introduction of a more significant 'user-pays' water pricing system is clearly evident as shown by Figure 2.2.1 and 2.2.2.

The total volume of water used for potable purposes has continued to decline since 2004-2005 and included a reduction of 7.4% during 2007-2008. This reduction is more significant than it may appear, given that the reduction has occurred despite population growth.

On a per property basis, water consumption fell by a further 6% during 2007-2008 to186KL. The data demonstrates the commitment of Council and the community to responsible use of water resources.

Figure 2.2.1 – Potable Water Use Trends

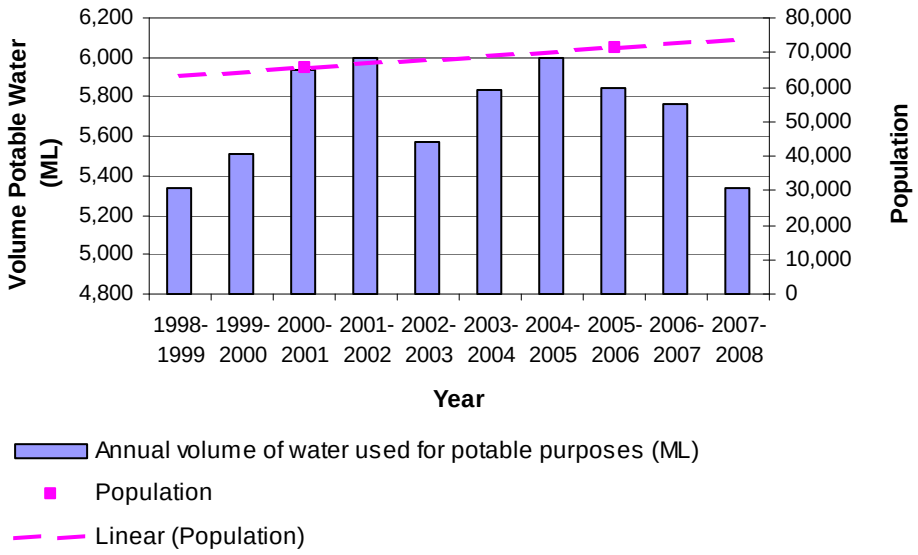
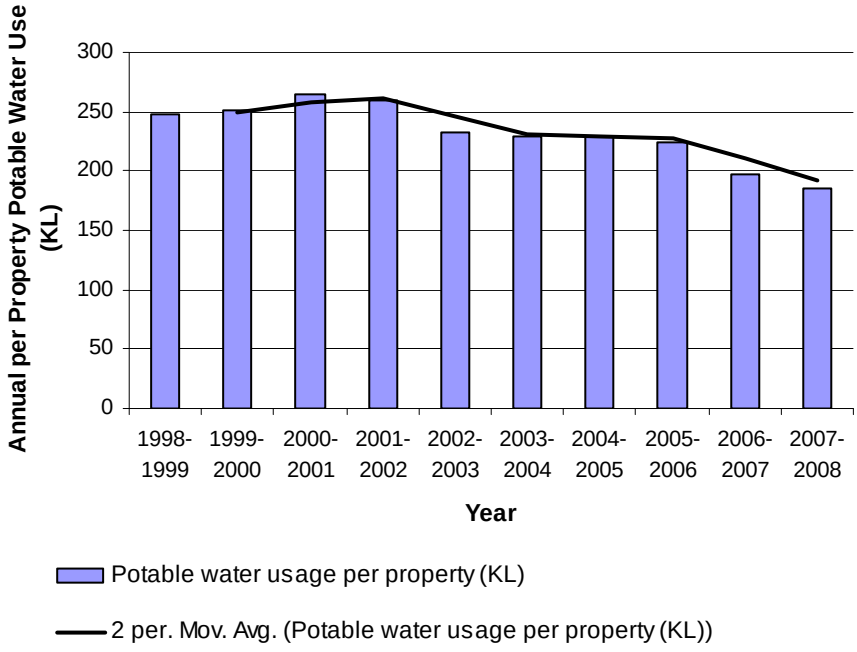


Figure 2.2.2 – Per Property Potable Water Use Trends



Responses

Port Macquarie-Hastings Council has implemented a number of significant responses to urban water management. Responses aim to provide a secure water supply while valuing the water resource and minimising impacts on the environment as a result of water abstraction. The following responses are relevant:

- Continuation of the two tier “user pays” water pricing that reflects the value of the water resource
- Commissioning of the Port Macquarie Reclaimed Water Plant and “lilac pipe” dual reticulation system that supplies reclaimed water to commercial premises and irrigate many open space areas including sports fields
- Construction of a reclaimed water reticulation network between Port Macquarie and the Camden Haven to link existing and future reclaimed water supply infrastructure at sewerage treatment plants and the Port Macquarie Reclaimed Water Plant.
- Ongoing comprehensive biological monitoring of the lower freshwater reaches and upper estuary of the Hastings River to assess impacts of river abstraction during drought conditions.
- Comprehensive public & school education
- Demand management including mandatory water conservation measures
- Water sensitive urban design
- Improvements to the existing water supply system
- Continuation of the Home Water Saver Rebate Scheme

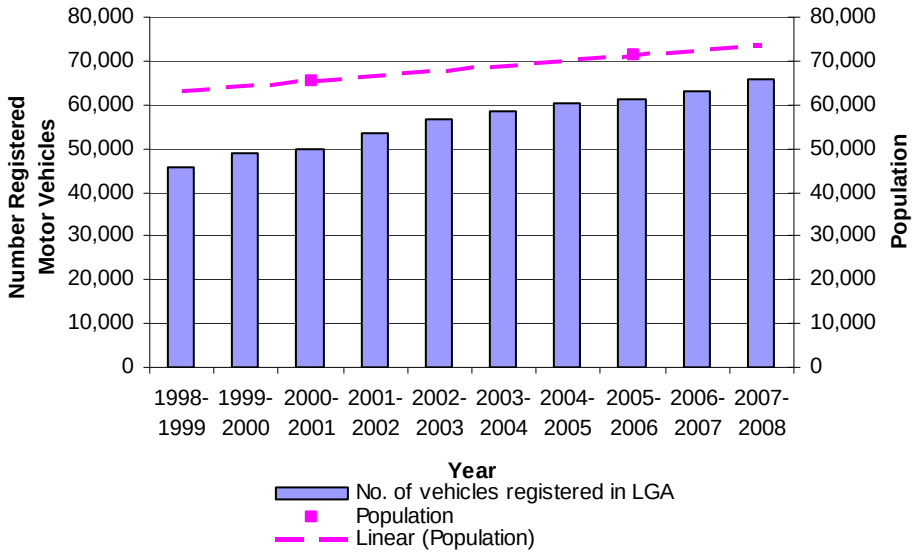
2.3 Transport

Trends

The most available and reliable indicator of transport impacts for the Port Macquarie-Hastings area is the number of registered motor vehicles in the LGA. The data reported below is sourced from Roads & Traffic Authority (RTA) reporting.

Figure 2.3.1 compares registered vehicle trends with local population growth. The number of registered vehicles is increasing in line with population growth over time. Although only a surrogate environmental indicator, this data supports the anecdotal evidence that impacts associated with transport and transport infrastructure would be increasing. Just how significant the local impacts on air quality, biodiversity and water quality is more difficult to quantify.

Figure 2.3.1 – Registered Vehicles in the Port Macquarie-Hastings LGA



Responses

Responses implemented by Council in relation to transport issues include:

- Continuation with Council's local cycleway program
- Ensuring provision for public bus transport into urban design
- Increasing the number of fuel efficient vehicles in the Council fleet

2.4 Waste Management

2.4.1 Solid Waste

Trends

Table 2.4.1.1 – Indicators for Solid Waste

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	Solid waste produced (tonnes)	76,000	71,445	78,744
Pressure	Solid waste landfilled (tonnes)	*	37,016	42,822
Pressure	Volume of domestic waste (tonnes)	*	19,813	10,954
Pressure	Solid waste generated per person per year (tonnes)[+]	1.2	1.05	1.07
Response	% of solid waste diverted from landfill	11.5%	43%	45%
Response	Solid waste recycled (tonnes)	*	30,653	35,343

[+] Per capita data based on total LGA population for consistency of annual figure
* Information not available

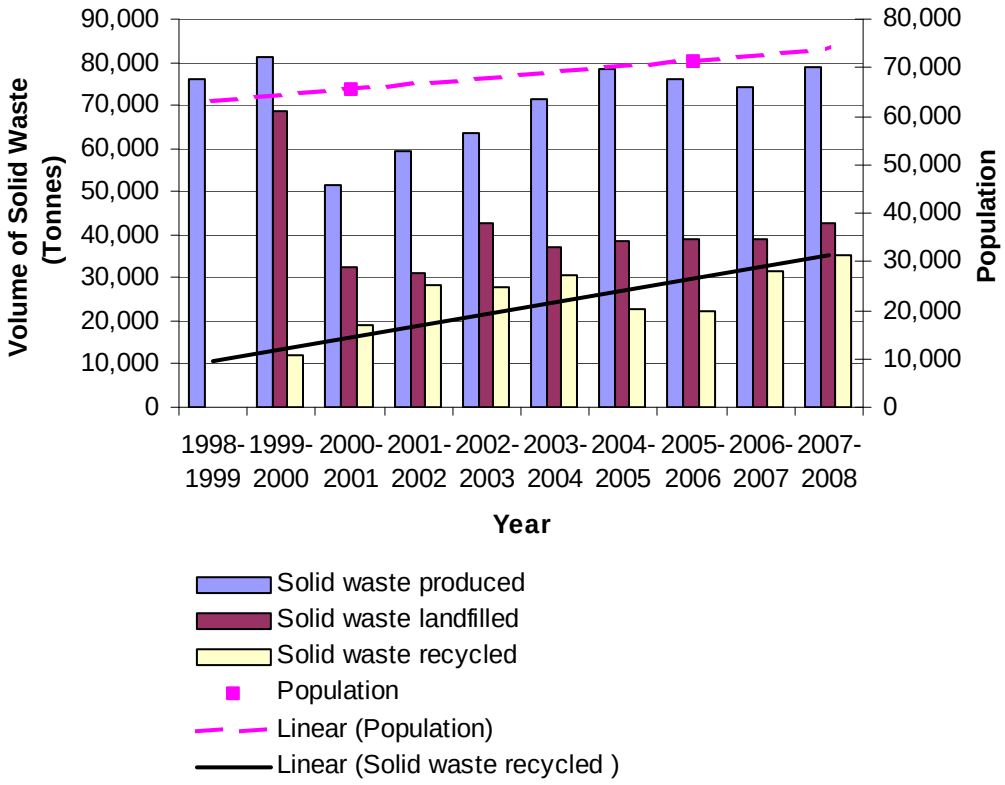
Solid waste management trends are provided in Table 2.4.1.1 and Figure 2.4.1.1.

Waste generation is primarily influenced by population growth. Despite population growth in the Port Macquarie Hastings LGA, total solid waste volumes generated over the last decade have remained stable.

During 2007-2008, solid waste generation rates increased by 6% and solid waste disposed to landfill increased by 10%. The increase in landfill disposal was tempered by a 1% increase in solid waste recycled (44%).

Per capita waste figures have been updated to reflect more accurate population estimate for the period since the last Census. The volume of waste generated in the LGA per capita has remained stable.

Figure 2.4.1.1 – Solid Waste Trends



Responses

Responses to solid waste management implemented by Port Macquarie-Hastings Council include:

- Implementation of a comprehensive kerbside waste collection system including household waste, organics and recyclables collection
- The operation of best practise waste recovery through the Organic Resource Recovery Facility and Materials Recovery Facility at the Cairncross Waste Management Facility
- Operation of a best practise management landfill at the Cairncross Waste Management Facility
- Adoption of a new Resource Efficiency and Sustainability Strategy 2007 to direct future waste management in the Port Macquarie-Hastings
- Remediation of closed landfill sites
- Development of 'waste plans' for construction and demolition industries
- Coordination of the regional Midwaste group

2.4.2 Liquid Waste

Trends

Table 2.4.2.1 – Indicators for Liquid Waste

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	Volume of wastewater received at sewerage treatment plants (ML)	6,979	6,381	8,222
Pressure	Volume of treated wastewater discharged from sewerage treatment plants to receiving waters (ML)	6,953	6,132	7,957
Pressure	Volume of wastewater per person per capita (KL) *	113	92	112
Response	Volume treated wastewater reused (ML)	26	249	265
Pressure	No. of on-site sewerage management systems (e.g. septics)	**	4,479	4,599
Response	No. of compliance inspections of on-site sewerage management systems by Council	**	170	**
Response	No. of inspections of on-site sewerage management systems by AWTS contractors	**	2,288	3,246
Pressure	No. of approved trade waste systems	341	483	500
Response	No. of compliance inspections of trade waste systems	**	800	498
State	% Compliance of trade waste systems	**	>90%	>90%

* Per capita data based on total LGA population for consistency of annual figure
** Information not available

Reticulated Sewerage System

Figure 2.4.2.1 shows the trends in treated wastewater volumes since 1998. Volumes of wastewater treated and discharged are heavily influenced by stormwater infiltration. Following the trend of the previous 12 months, a high volume of effluent was generated during 2007-2008. This result being attributed to the continuation of wetter conditions during the period.

Figure 2.4.2.2 shows a return to higher levels of effluent reuse during 2007-2008 despite it being a relatively wet year (when traditional forms of reuse are not viable e.g. irrigation). This trend is attributable to the commissioning of the Port Macquarie Reclaimed Water Treatment Plant and the subsurface irrigation of this product on open space areas as part of the plant commissioning and validation process. It is expected that a significant increase in reclaimed water use will occur in 2008-2009 as a result of the full commissioning of the facility and the supply of reclaimed water to commercial users.

On-Site Sewage Management

On-site sewage management trends are presented in Figure 2.4.2.3. The number of on-site sewage management systems continues to grow. This is a direct reflection of increasing rural and rural residential development and improved monitoring of on-site sewage management systems by Council.

Inspections of aerated wastewater treatment systems by service contractors continue to increase as a result in the growth in number of theses systems and a more efficient monitoring and regulatory regime implemented by Council.

The number of inspections by Council officers is not available for 2007-2008. The total annual number of inspections represents only a small percentage of the total number of on-site sewage management systems in the LGA. Many systems, particularly in the outlying rural areas have not been inspected to date.

Figure 2.4.2.1 – Volumes of Wastewater Treated and Discharged from STPs

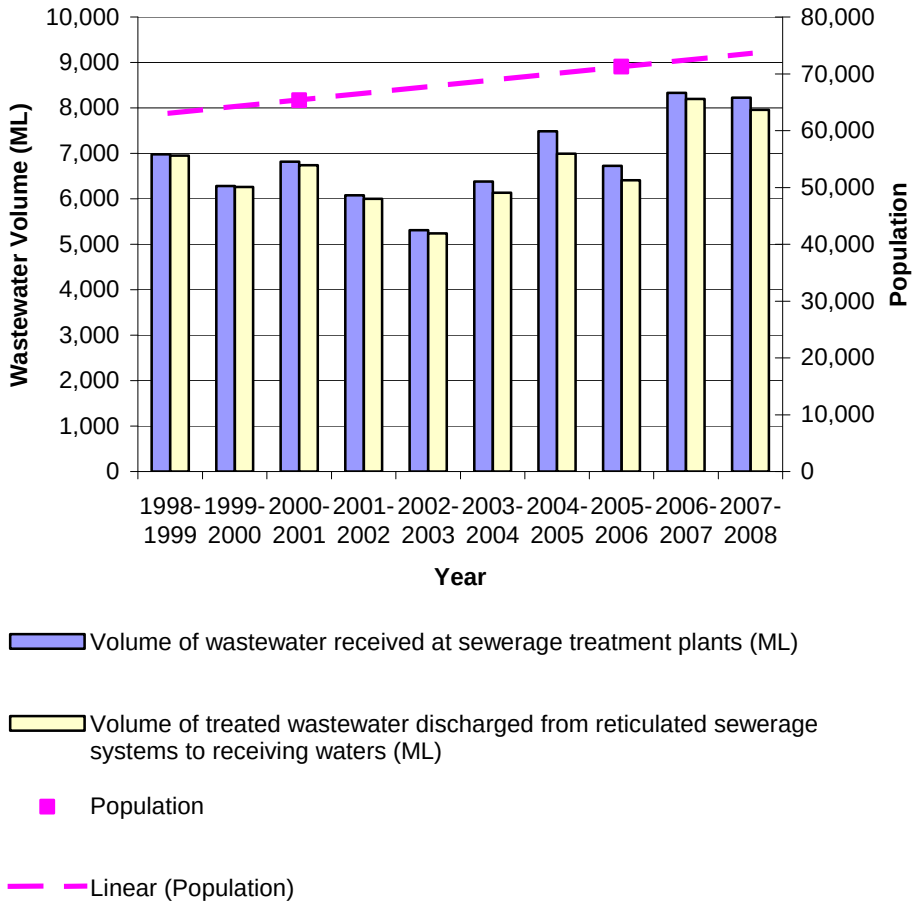


Figure 2.4.2.2 – Reclaimed Water Use

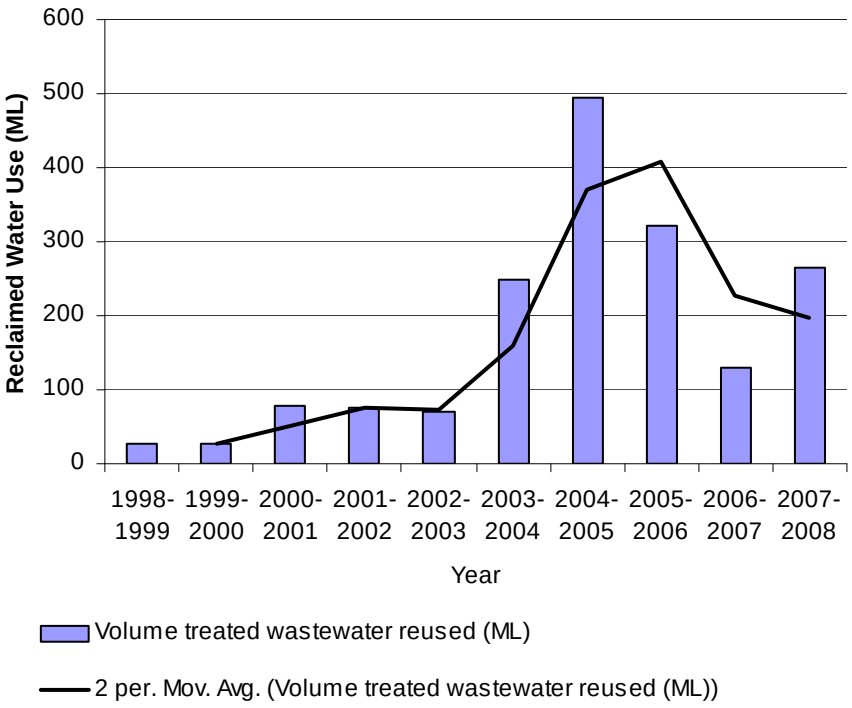
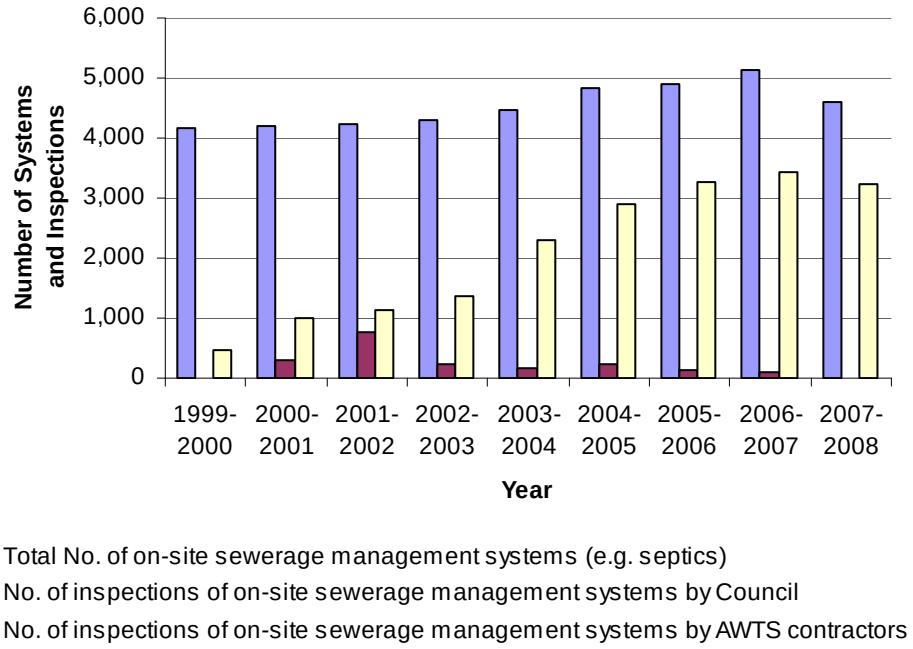


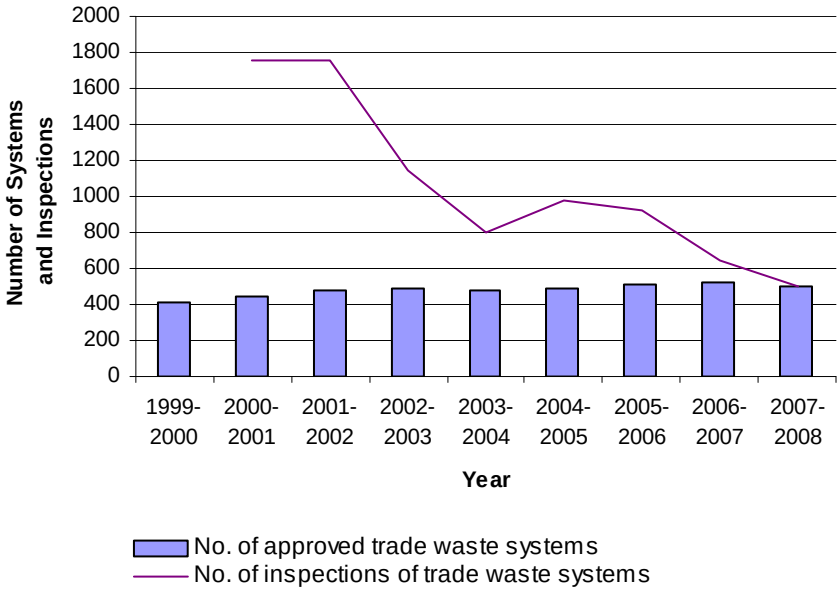
Figure 2.4.2.3 – On-Site Sewage Management State



Trade Waste

The number of trade waste systems installed to prevent the discharge of harmful substances to the sewerage system is stable and is a reflection on the growth of commercial and industrial development in the LGA. The number of compliance inspections carried out by council has decreased as a result of a move to a risk based monitoring regime where inspections are concentrated on higher risk premises. Trends are depicted in Figure 2.4.2.4.

Figure 2.4.2.4 – Trade Waste Trends



Responses

Reticulated Sewerage System

Recent responses include:

- Continued development of the Hydraulic Model of the reticulation and delivery networks of the sewerage schemes. The model provides important operational data and drives new rehabilitation and capital works projects to meet the continuing pressure from development on the system
- Supply of reclaimed water from the Port Macquarie Reclaimed Water Treatment plant to commercial users in Port Macquarie, reducing both potable demand on the Water Supply and environmental discharge volumes into Kooloonbung Creek from the Port Macquarie Sewerage Scheme
- Continued development and construction of the Southern Effluent Pipeline to distribute and beneficially reuse effluent from the Lake Cathie/Bonny Hills STP to existing and future reuse markets in the southern sector of the LGA
- Development of the Camden Haven sewerage scheme Surcharge Reduction report and associated works to reduce the frequency of surcharges from the network into the Camden Haven River and its effect on the local oyster industry

On-Site Sewage Management

Implementation of the Port Macquarie-Hastings On-Site Sewage Management Plan including:

- Routine compliance inspections for on-site sewage management systems using a risk based approach
- Monitoring of aerated wastewater treatment systems (AWTS) servicing
- Use of GIS based Soil Risk Mapping throughout the Port Macquarie-Hastings local government area reflecting risk of effluent disposal from OSM systems
- Providing pre-purchase inspections upon request for prospective property purchasers
- Continued development of village reticulated sewerage schemes as a replacement for high-risk village on-site sewage management systems. Construction timeline for 5 villages have been adopted
- In March 2008, the establishment of a Water & Sewerage Approvals and Regulatory Group to improve Council's monitoring and auditing of water and sewerage works including on-site sewerage management systems

Trade Waste

Responses to trade waste issues include:

- Proactive risk based compliance inspections of trade waste systems
- Approval and regulation of proposed systems to ensure acceptable treatment standards are maintained
- Provision of advice and information to business and industry in relation to trade waste management
- Investigation and enforcement of breaches of trade waste management approvals
- In March 2008, the establishment of a Water & Sewerage Approvals and Regulatory Group to improve Council's monitoring and auditing of water and sewerage works including trade waste systems

2.5 Heritage

Trends

Table 2.5.1 – Indicators for Heritage

Type	Indicator	1998-1999	2003-2004	2007-2008
Response	No. of protected non-Aboriginal heritage items	132	153	159
Response	No. of protected Aboriginal heritage items	198	385	406

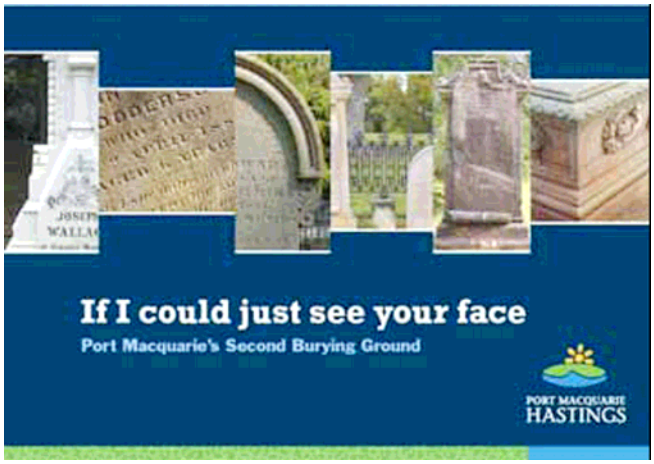
A review of the records pertaining to sites of non-Aboriginal Heritage reveals that 159 sites are currently protected under a variety of mechanisms. These sites include built, archaeological and natural sites.

Information supplied by the Department of Environment and Climate Change reveals that there was one additional site of Aboriginal heritage (classified as a shell site) afforded a legal conservation status during 2007-2008. One site was also altered/destroyed/damaged under the authority of the Department of Environment & Climate Change (pursuant to the National Parks & Wildlife Act) resulting in no net change to the indicator above.

Responses

Port Macquarie-Hastings Council continues its approach of proactive heritage conservation. The following responses were implemented last financial year:

European Heritage



- Addition of three new sites to the Hastings Local Environment Plan being; the Kendal School Masters Residence, the Pembroke Community Hall; and archeological ruins under the Glasshouse and adjacent Hay Street
- Conservation work on twelve (12) monuments within Port Macquarie's Second Burying Ground (1824-1886), bringing the total number of graves benefiting from restoration work to thirty eight (38) since 2005
- Secured grant funding from the NSW Heritage Office for various heritage activities
- Council allocated a total of $61,300 from the Heritage Assistance Fund to 7 property owners to carry out repairs, maintenance or to re-instate missing items to their heritage listed property
- In April 2008, held the annual Heritage Festival as part of the National Trust's state-wide festival of events. More than 4,500 people attended local events.
- Commenced a review of the Hastings Heritage Strategy with a view to replacing with a new Heritage Plan 2008-2012
- Continued the Heritage Advisory Service that assists Council and the community to implement appropriate measures to conserve and present local heritage
- Published the awareness information and a school education kit about Port Macquarie's Second Burial Ground to increase awareness within the school and broader community of the heritage significance of this site

Aboriginal Heritage

- Continued development of the draft Aboriginal Heritage Strategy
- Continued development of the Reconciliation Action Plan (contains an Aboriginal Heritage component)
- Aboriginal heritage assessment as part of the development assessment process
- Aboriginal heritage awareness during Heritage Week
- Aboriginal heritage consultation and partnership regarding the upgrade of Pacific Highway; Coopernook to Heron's Creek

2.6 Amenity

'Amenity' refers to a wide range of attributes and values that make a positive contribution to peoples' quality of life. As urban populations and housing densities grow, these amenity values come under potential threat. While amenity values for most communities have not been formally identified, both local and state governments recognise the importance of new challenges to amenity rising from the land-use planning process.' (DEC, 2003)

2.6.1 Noise impacts

Trends

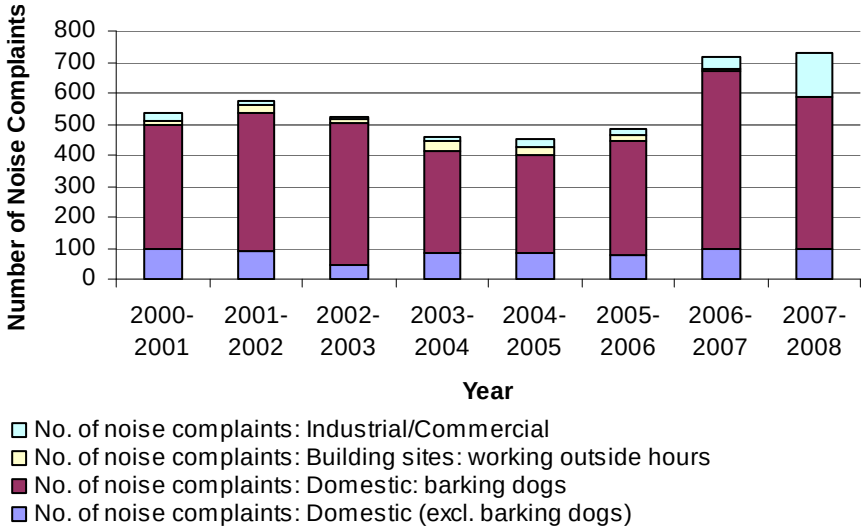
Table 2.6.1.1 – Indicators for Noise

Type	Indicator	2000-2001	2003-2004	2007-2008
Pressure	No. of noise complaints: Total	537	460	723
Pressure	No. of noise complaints: Domestic (excl. barking dogs)	97	81	98
Pressure	No. of noise complaints: barking dogs	402	332	488
Pressure	No. of noise complaints: building sites - working outside hours	13	29	1
Pressure	No. of noise complaints: Industrial/Commercial	25	18	141

Table 2.6.1.1 provides details of the number and nature of noise complaints received by Port Macquarie-Hastings Council. The overall number of noise complaints received increased slightly between 2006-2007 and 2007-2008 as shown in the figure below. A 17% reduction in the number of barking dog complaints was offset by a significant increase in the number of complaints about commercial/industrial noise.

Increases in the number of vehicles in the LGA are also an indicator of increase transport noise. Figure 2.3.1 is relevant in this respect, showing vehicle registrations are growing inline with local population.

Figure 2.6.1.1 – Noise complaints received by Council



Responses

Port Macquarie-Hastings Council has a number of responses to the issue of noise, including:

- Ensuring that new development proposals comply with relevant acoustical requirements
- Monitoring of new developments to ensure compliance with conditions relating to noise control
- The assessment of rezoning proposals to ensure that noise problems do not arise as a result of landuse changes
- The investigation and resolution of noise complaints
- The development of educational/informational initiatives (e.g. pamphlets)
- Noise assessment as part of the planning and design of new road infrastructure
- Cycleway construction to reduce reliance on motor vehicles and hence reduce traffic noise
- Airport planning to ensure surrounding land uses comply with airport noise forecast requirements

2.6.2 Odour

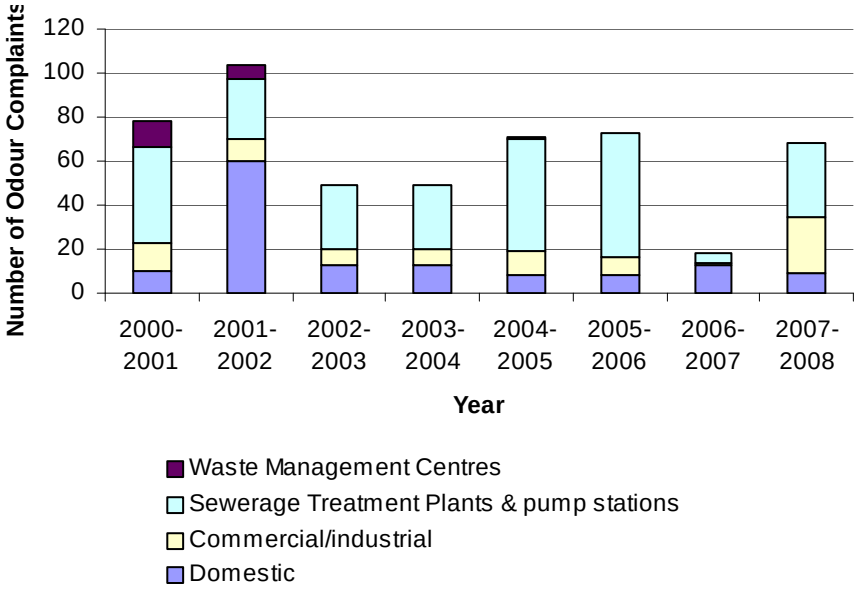
Trends

Table 2.6.2.1 – Indicators for Odour

Type	Indicator	2000-2001	2003-2004	2007-2008
Pressure	No. Complaints (total)	78	49	68
Pressure	- Domestic	10	13	9
Pressure	- Commercial/industrial	13	7	26
Pressure	- Sewerage Treatment Plants & pump stations	43	29	33
Pressure	- Waste Management Centres	12	0	0

The number of odour complaints is used as an indicator or the impact of odour on the community. Odour complaints received by Council during 2007-2008 increased significantly when compared to the previous year but represent a normal trend in comparison to data since 2000. Complaint types are dominated by commercial/industrial activities and sewerage infrastructure operations.

Figure 2.6.2.1 – Odour complaints received by Council



Responses

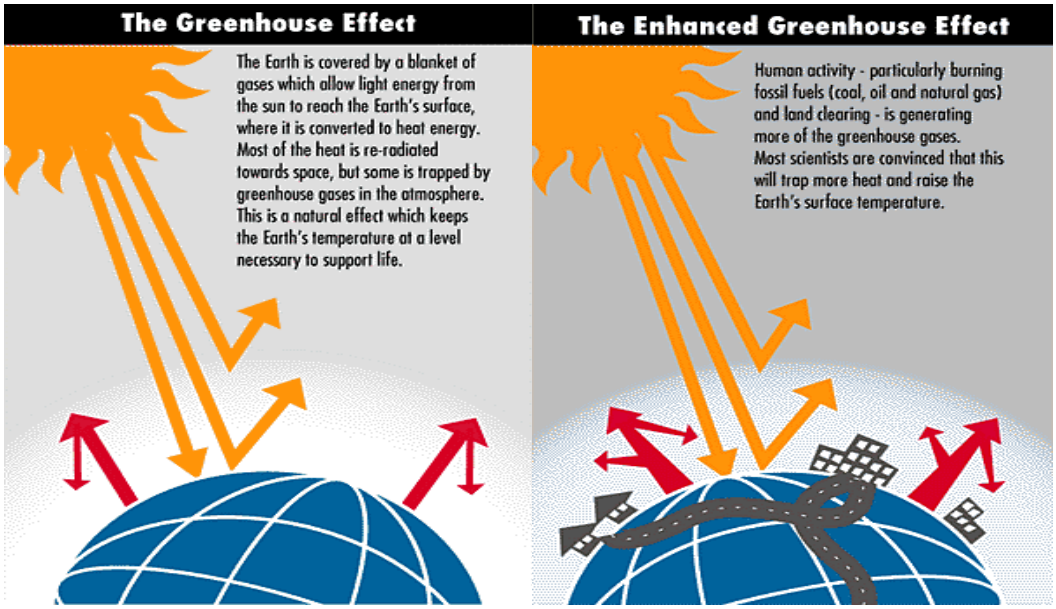
Port Macquarie-Hastings Council has a number of responses to the issue of odour, including:

- Ensuring that new development proposals comply with relevant environmental standards
- The assessment of rezoning proposals to ensure that odour problems do not arise as a result of landuse changes
- The investigation and resolution of odour complaints
- Odour assessment as part of the planning and design of new sewerage treatment infrastructure
- Continuous improvement of sewerage infrastructure operations
- Best practise waste management and landfill management

Chapter 3 – Atmosphere

3.1 Greenhouse Gas Emissions

Figure 3.1.1 – The Enhanced Greenhouse Effect



Trends

Table 3.1.1 – Indicators for Global Warming

Type	Indicator	1996	1999	2001	2004	2006	2007
Pressure	Estimated LGA greenhouse gas emissions tonnes/year[++]	585,529		783, 281	**	1,045,957	**
Pressure	Estimated LGA greenhouse gas emissions tonnes CO_2 eq /capita/year[++]	10.2		11.9	**	14.7	**
Pressure	LGA Energy consumption (GJ)[++]	4,782,187		6,021,647	**	7761381	**
Pressure	LGA Energy use /capita /year (GJ)	83.6		92.1	**	108.9	**
Pressure	Council operational greenhouse gas emissions tonnes/year	**	14,532	**	21, 521	**	26,487

[++]Local estimates based on Census data
**Information Not available

Table 3.1.1, Figure 3.1.1 and 3.1.2 provides new indicator data on both community emissions and Council's corporate emissions.

Figure 3.1.1 - LGA Greenhouse Emissions

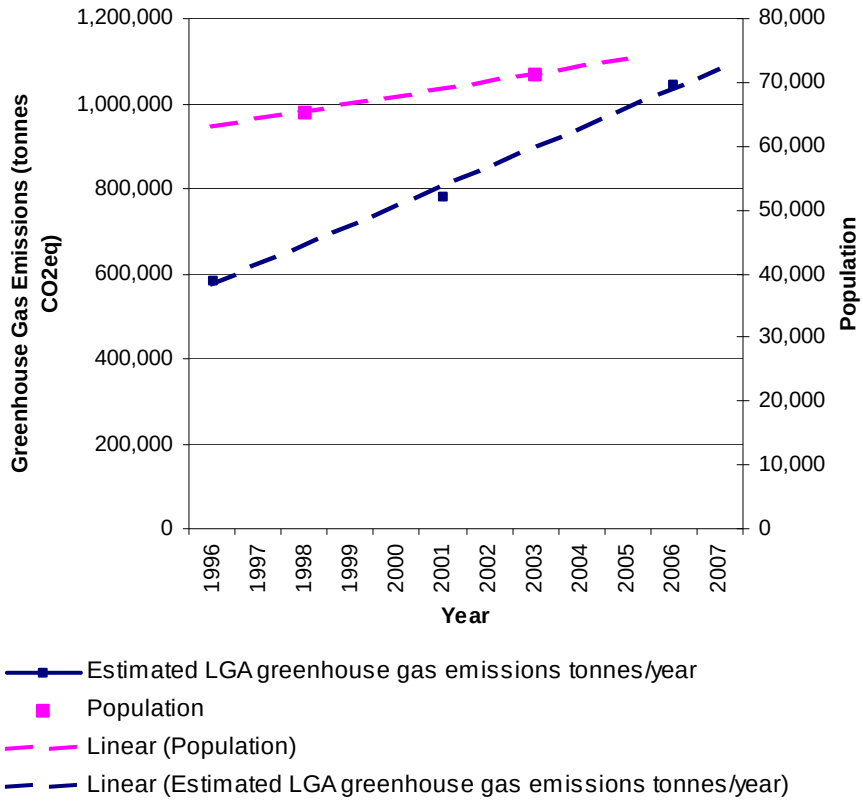
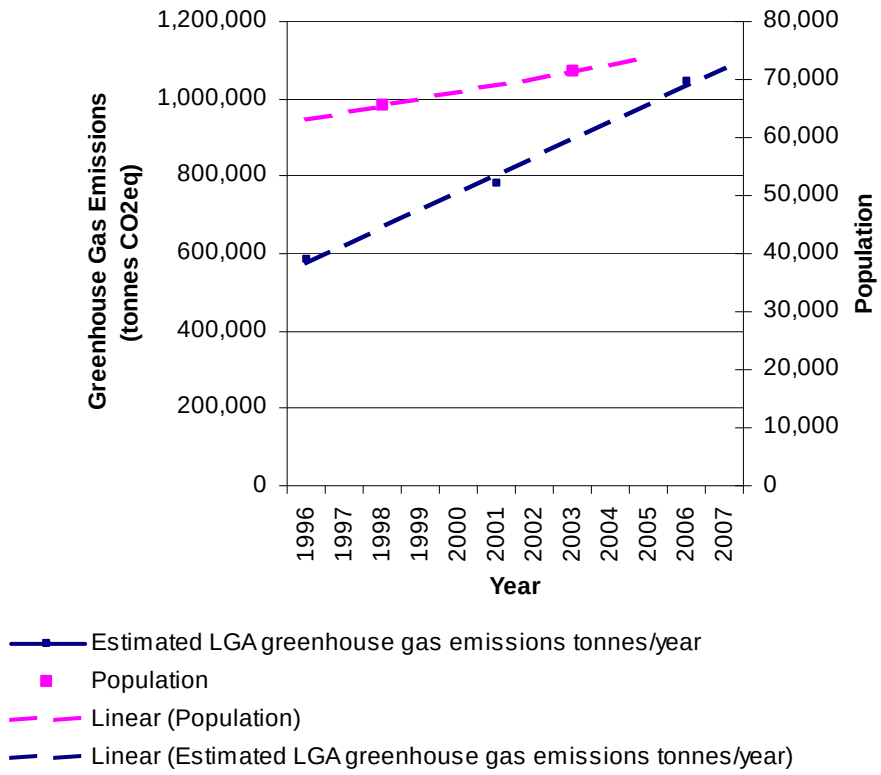


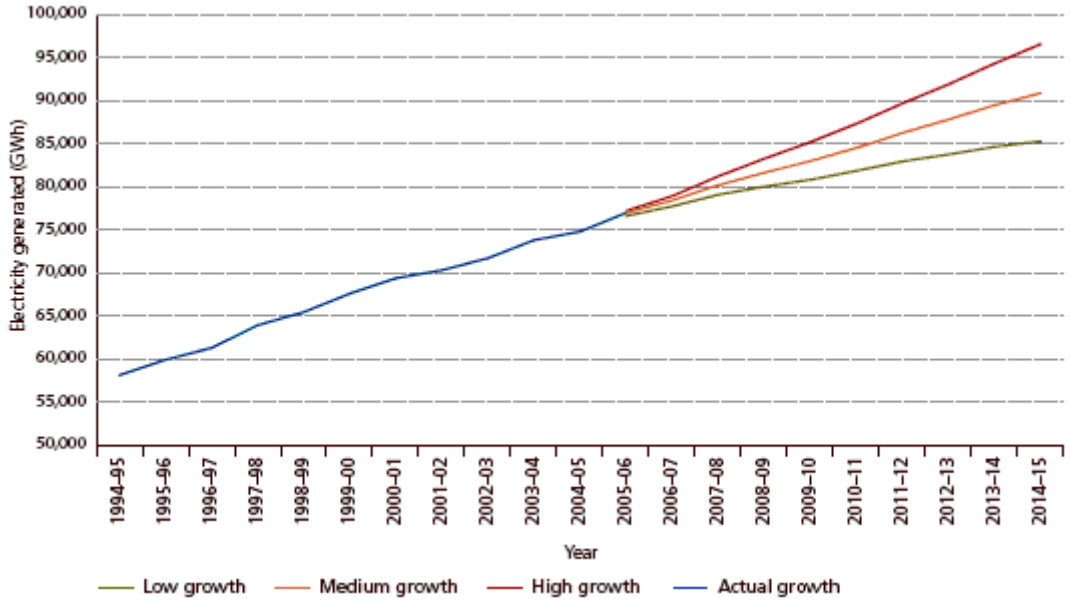
Figure 3.1.2 - Council's Corporate Emissions



This data reflect that emissions are increasing at a higher rate than population growth despite local energy efficiency and emissions abatement initiatives. This rate of increase reflects Australians energy consumption as among the highest in the developed world and that a significant change in culture is required to combat the effects of climate change.

Figure 3.1.3 shows predicted trends in electricity consumption under three growth scenarios. Rising electricity demand in NSW is being driven by population and economic growth and changes in people's behaviour and lifestyles. As real incomes have risen so too have levels of material consumption. For example, NSW households with air conditioners rose from 31% in 1994 to 54% in 2005, and the number of homes with more than one cooling unit in operation also increased. The ownership of dishwashers also jumped from 25% to 43% over the same period (DECC, 2006).

Figure 3.1.3 - Actual growth and predicted trends in electricity consumption for three scenarios



*Note: The low, medium and high economic growth scenarios include projections of population, gross state product, real electricity and natural gas prices and interest rates.

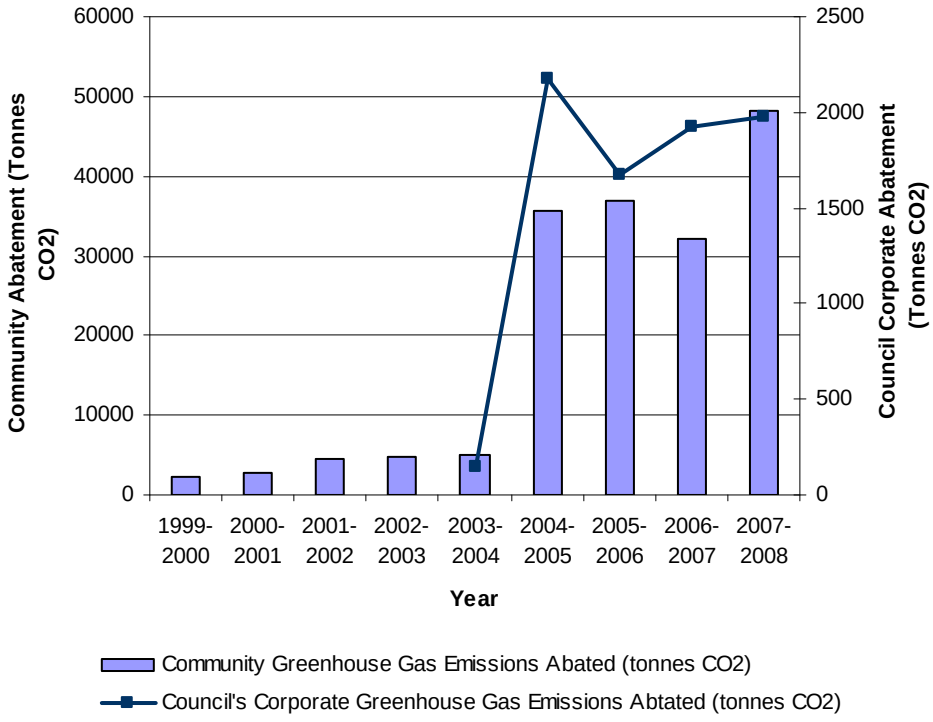
Figure 3.1.4 shows emissions abatement between 1999 and 2007 in the community sector and for Council's corporate operations resulting from local emissions abatement activity. Community abatement between 1999 and 2003 comprised of reductions in energy demand resulting from the introduction of energy efficiency standards in new residential buildings. The significant increases from 2004-2005 onwards result from kerbside organic waste recycling initiatives in the community.

Abatement from Council's corporate activities are a combination of energy efficiency improvements in public facilities and the purchasing of green power across a number of sites.

It should be noted that Council's corporate abatement performance can be considered somewhat better than indicated by Figure 3.1.3. Abatement for the period between 2006 and 2008 also include around 5.8 gigawatts of renewable energy that cannot be accredited as Greenpower because the generation facilities that produce this power existed prior to the commencement of the NSW Greenhouse Gas Abatement Scheme.

In 2007/2008, council purchased 27% renewable electricity across all sites, of which only 8% can be accredited as Greenpower.

Figure 3.1.4 - Local Greenhouse Gas Abatement



Responses

Council's responses to global warming are based upon its participation in the Cities for Climate Protection Program and its Greenhouse Action Strategy. Specific responses implemented in 2007-2008 include:

- Purchasing renewable energy. In 2007-2008 Council purchased 27% renewable energy across all operations (cost about $78,000) reducing greenhouse gas emissions by about 5,000 tonnes of CO_2. (of this renewable energy, 1.4 gigawatts was accredited green power equating to 1,400 tonnes greenhouse gases savings)
- Implementation of a Fleet Sustainability Policy resulting in a 3% reduction in CO_2 emission from Council's fleet between 2004 and 2007
- Negotiating with Country Energy to implement an energy efficient streetlighting plan
- Investigation of carbon trading opportunities associated with organic waste management
- Greenwaste composting, saving 40,000 tonnes of CO2 by reducing the amount of greenwaste going to landfill
- Partnership with Envirosaver Program to retrofit energy efficient lighting and AAA shower roses in residential dwellings

Existing greenhouse abatement activities include:

- Major energy efficiency upgrading at Council's Port Macquarie, Laurieton and Wauchope offices and libraries saving 15% on energy consumption and over 200 tonnes of CO_2 annually. Ongoing energy efficiency measures being implemented in council buildings
- Energy efficiency upgrade of Bonny Hills caravan park hot water system, saving 135 tonnes of CO2 annually
- Power factor correction in large electricity using sites
- Converting to energy-efficient office equipment, saving over 20 tonnes of CO_2 annually
- Activating Energy Star features on all PCs as a default setting and replacement all CRT screens with LCD models

- Carried out a Fleet Sustainability Study which led to changes to Council's Motor Vehicle Policy and an increase in the number of fuel efficient vehicles in the fleet (in 06/07 33% reduction in number of large 6 cylinder vehicles, 100% increase in mid size 4 cylinder vehicles, 243% increase in small 4 cylinder vehicles (including 9 small 4cyl diesel vehicles), 1 hybrid vehicle, Converting 4 cylinder 2wd utilities from petrol to diesel models (8))
- Trials of biodiesel in selected plant with a view to using this fuel as a petrodiesel substitute
- Trialling load based aeration controls at the PM STP to reduce energy consumption.
- Shelley Beach Amenities Solar Power Project
- Introducing energy-efficiency standards in residential development (prior to BASIX)
- WaterWise Programs
- Production of a Household Greenhouse Information Package and distribution at events and in mail outs
- Promoting energy efficiency and renewable energy on Council's website
- Promoting community energy efficient lighting

3.2 Urban Air Quality

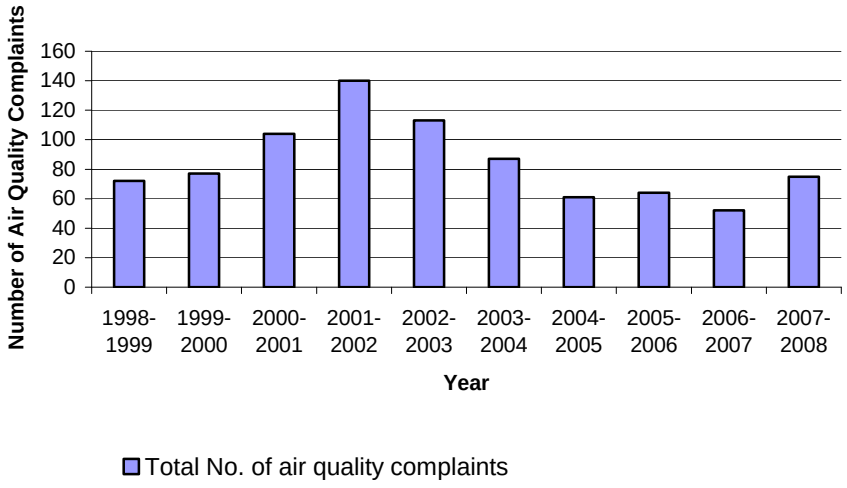
Trends

Table 3.2.1 – Indicators for Urban Air Quality

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	No. of EPA licensed premises	23	18	22
Pressure	Total No. of air quality complaints	72	87	75
Pressure	No. of air quality complaints - backyard burning	**	11	25
Pressure	No. of air quality complaints – other	**	65	50

Data relating to the number of air quality related complaints received are shown in the Table 3.2.1 and Figure 3.2.1. The number of air pollution complaints received increased during 2007-2008. This is a reversal of the downward trend since 2001 but remains within the range of the trend since 1998.

Figure 3.2.1 – Air Pollution Complaint Trends



The number of motor vehicles registered in the Port Macquarie-Hastings is a surrogate indicator of air quality given that transport is known to be a major contributor to air pollution. Trends in motor vehicle registrations are shown in Figure 2.3.1.

Responses

Responses to air quality issues initiated by Port Macquarie-Hastings Council include:

- Ensuring new and existing developments adopt appropriate management practices
- Responding to complaints and distribution of educational material relating to air pollution issues such as solid fuel home heaters
- Prohibition on the burning of waste in non-rural areas and regulating the burning of vegetation wastes in all areas of the LGA
- Best practise waste management and landfill management
- Constructing cycleways

Chapter 4 – Land

4.1 Land Use Changes

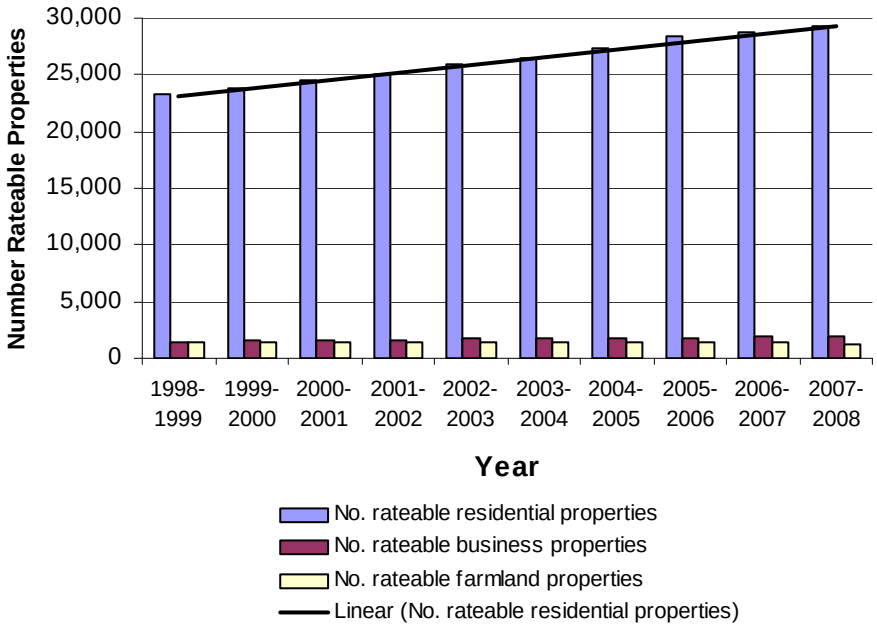
Trends

Land Use

Figure 4.1.1 shows that the number of rateable residential and business properties are steadily growing. The number of rateable farmland properties has decreased, but as a result of administrative rating changes rather than a specific reduction in farmland.

This data demonstrates the increase in urban landuse, but is likely to understate the reduction in rural land resulting from urban growth. More accurate land use area information is needed to better quantify landuse changes.

Figure 4.1.1 – Property Use Trends



Development

Figure 4.1.2 shows a breakdown of the development applications received and processed by Council. The data shows a slight recovery from decreasing approvals since 1999-2000 in the Port Macquarie-Hastings. The number of approvals remains consistent with the economic conditions associated with the property and housing industries. However, these rates of development are still considered high when compared to other regional areas.

Figure 4.1.3 provides a graphical break down of the volume and type of development approvals issued.

The demographic and urban landuse information that is available demonstrates that the growth in urban landuse continues to be the most significant in the coastal 'strip'.

Figure 4.1.2 – Development Activity

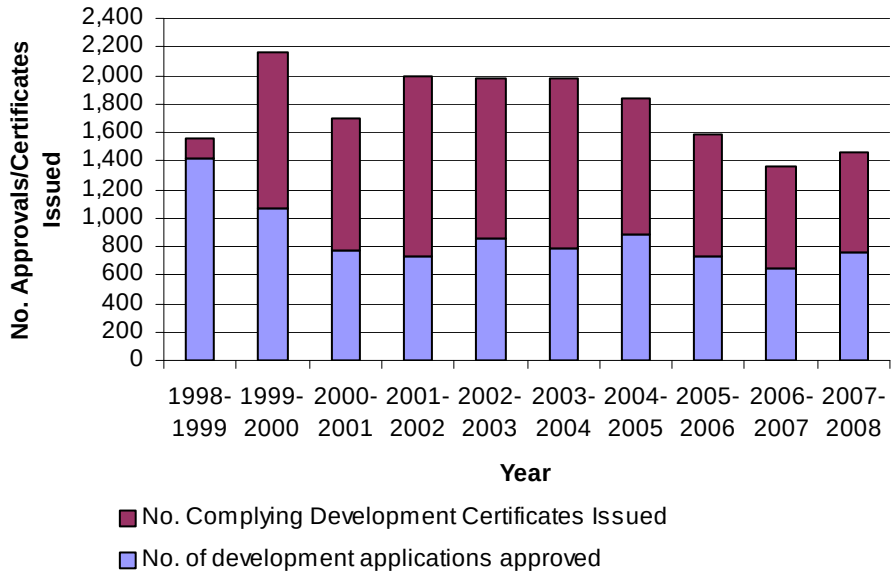
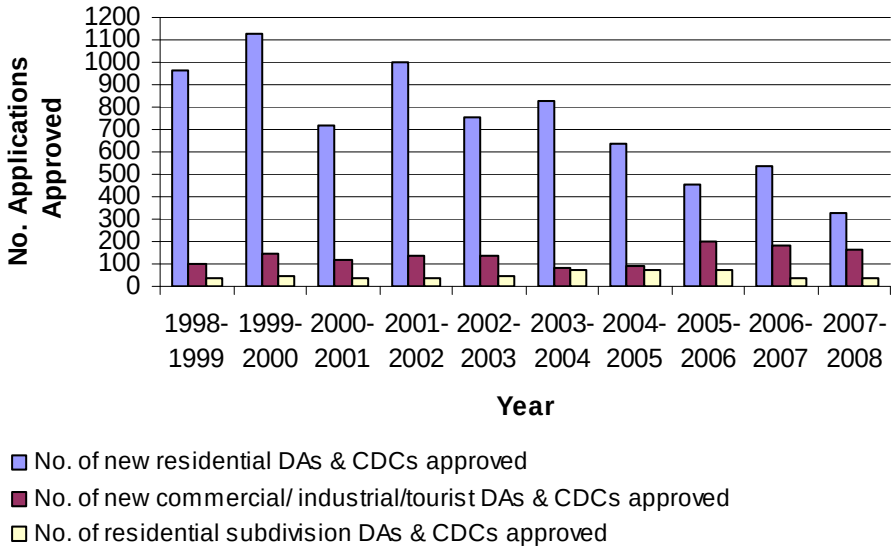


Figure 4.1.3 – Development Type Comparison



Responses

Response to land use changes are implemented through a variety of strategic planning tools including:

- Hastings Urban Growth Strategy
- Camden Haven Urban Growth Strategy
- Wauchope Urban Growth Strategy
- Rural Residential Release Strategy

These strategies are complimented by infrastructure strategies such as the Hastings Effluent Management Strategy, the Hastings Drought Management Plan and Resource Efficiency & Sustainability Strategy 2007 that over arch numerous specific projects aimed at servicing sustainable urban growth.

More detailed local planning issues are being managed to deliver appropriate development outcomes associated with the development of land at Area 13 (Thrumster) and Area 14 (Ngamba). The outcomes of this work are informing Local Environment Plans and Development Control Plans for these areas.

Development is managed and controlled through a suite of planning laws hinged upon the Environmental Planning & Assessment Act 1979 and the Hastings Local Environment Plan 2001.

4.2 Soil Erosion

Trends

Table 4.2.1 - Indicators for Soil Erosion

Type	Indicator	2000 - 2001	2003-2004	2007-2008
Pressure	Erosion & sediment control - building sites - complaints	New Indicator	9	34
Response	Erosion & sediment - building sites - warnings issued	New Indicator	30	9
Response	S&E control - building sites - fines issued	New Indicator	11	2

The surrogate indicators in Table 4.2.1 are used to infer soil erosion impacts in the urban landscape. Soil erosion from development, building and subdivisions, has localised impacts on land and in receiving waters. Table 4.2.1 contains data on the number of complaints and enforcement activity relating to this issue. The data indicates a continued increase in complaints relating to erosion and sediment control on building sites and decrease in enforcement activity.

Broad scale erosion is not a significant issue in the LGA. A high level of woody vegetation cover (71%) minimises broad scale erosion potential. However, the Department of Natural Resources (DNR) have identified eight sub-catchments affected by land degradation (Taylor, 2000), being Bellangry, Bulga Plateau, Comboyne, Red Hill, Seaview, Stewarts River, Tilbaroo, and Upper Rollands Plain. Principle forms of land degradation affecting these sub-catchments are gully and riverbank erosion.

Within these eight sub-catchments a total of 45.7 km of riverbank erosion has been identified. Additional riverbank erosion is prominent in the estuarine reaches of the Maria River, Hastings River and Stingray Creek.

In addition to the above coastal erosion issues exist at Town Beach, Port Macquarie and Lake Cathie. Erosion at these locations is caused by the prevailing wave climate and weather patterns and is being enhanced by climate change induced sea level rise.

Responses

A number of different responses have been implemented by Port Macquarie-Hastings Council to reduce soil erosion including:

- Stream bank erosion projects in partnership with the Department of Natural Resources, Landcare and the Northern Rivers Catchment Management Authority. A significant project being the remediation of river bed erosion on the Wilson River at Rollands Plains
- Implementation of targeted river reach remediation works on the Camden Haven and Hastings Rivers
- Implementation of Council's Best Practice Management Guideline For Gravel Road Maintenance to minimise off-site water pollution for differing soil type zones, rainfall zones and road gradients
- River bank protection works at Googley's Lagoon, Dunbogan
- Installation of rock protection and dune reconstruction at Town Beach in accordance with the Town Beach Coastal Zone Management Plan
- Commencement of a Coastal Hazard Study to identify coastal erosion risks at Lake Cathie

4.3 Acid Sulfate Soils

Trends

Table 4.3.1 - Indicators for Acid Sulfate Soils

Type	Indicator	1998-1999	2003-2004	2007-2008
Response	Total area of wetland /wet pastures re-established (ha)	0	762	940
Response	Percentage of acid sulfate soils drainage networks remediated (out of a total of 60)	0%	65%	100%

Indicator data in Table 4.3.1 focuses on remedial action as a surrogate measure of acid sulfate soil impact reductions. Based on monitoring and recent research (Johnson *et al*., 2004) it is approximated that between 60 - 80% reduction in acid discharge has occurred at remediated drains.

Impact reductions resulting from the implementation of remediation projects include:

- Reductions in the duration and frequency of acid discharges from remediated drainage networks, improving estuarine water quality
- Remediation of acid scalded land
- Remediation and maintenance of back swamp environments

Responses

All 60 known acid discharging drains have been remediated at a cost of $1.35M over a six-year period. All five 'hotspots' in the Hastings and Camden Haven catchments have been remediated or are in partial remediation. A total of 940 hectares of wetlands has been rehabilitated using a wet pasture management to promote vegetation regrowth and contain acidic groundwater. A total of 5,380ha of floodplain land is under voluntary agreements for acid sulfate soil management. Figure 4.3.1 provides examples of the type of remediation work that has been implemented and Figure 4.3.2 provides a graphical representation of completed remediation work.

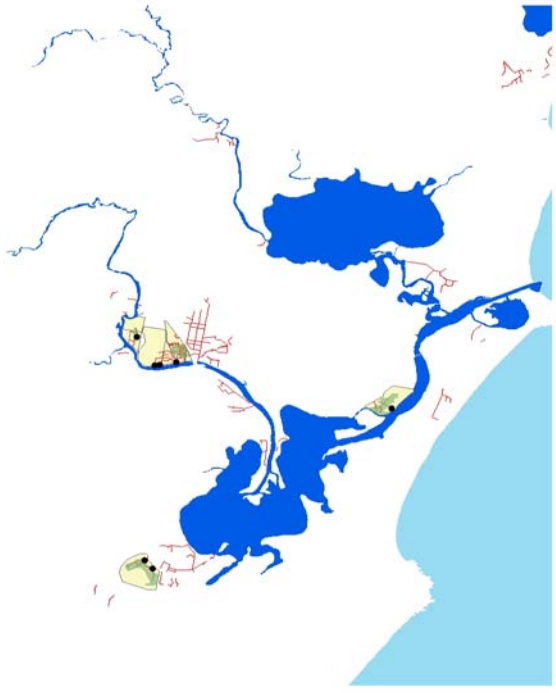
Figure 4.3.1 - Acid Sulfate Soil Remediation, Pre & Post Works at Rossglen

Acid scald at Rossglen Wetlands prior to remediation

Acid scald remediation: wetland vegetation and hydrology restored.

Figure 4.3.2 - Acid Sulfate Soil Remediation Works

Camden Haven Floodplain



Hastings Floodplain

Legend

Artificial Drainage

Remediated wetlands / wet pasture

Remediation Structures

Land under Plans of Management

4.4 Land Contamination

Trends

Table 4.4.1 - Indicators for Land Contamination

Type	Indicator	1999-2000	2003-2004	2007-2008
State	No. of potentially contaminated sites	165	157	157
State	No. of DEC confirmed contaminated sites	2	0	0
State	No. of sites under investigation by DEC	14	0	0

Table 4.4.1 above shows contaminated land statistics from Council's geographical information systems. Five sites were removed from Council's records in 2007-2008 as a result of remediation works and/or consolidation of lots. There has been an overall decrease in contaminated site on Council's records since 1999-2000.

There are currently no sites in the LGA listed or under investigation by the Department of Environment and Conservation pursuant to the Contaminated Land Management Act.

Responses

Port Macquarie-Hastings Council implements a number of responses to land contamination including:

- Regulation of land contamination under Protection of the Environment Operations Act 1997
- Management of land contamination risk associated with landuse changes and development proposals
- Maintaining information systems on the number and nature of contaminated sites with the LGA
- Notifying prospective land purchasers of land contamination status using s149 Certificates

Chapter 5 – Water

5.1 Surface Water Extraction

Trends

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	Total water demand from local rivers for potable supply (ML)	5,153	6503.2	4,278
Pressure	Annual water demand from Hastings River by Council for potable supply (ML)	5,079	6420.4	4,205
Pressure	Annual water demand from Thone River by Council for potable supply (ML)	31	31.1	22.8
Pressure	Annual water demand from Wilson River by Council for potable supply (ML)	43	51.5	50.2
Pressure	Number of surface water licences	298	345	322
Pressure	Allocation (ML/yr) for surface water licences excluding Town Water Supply	New Indicator	11,792	11,802

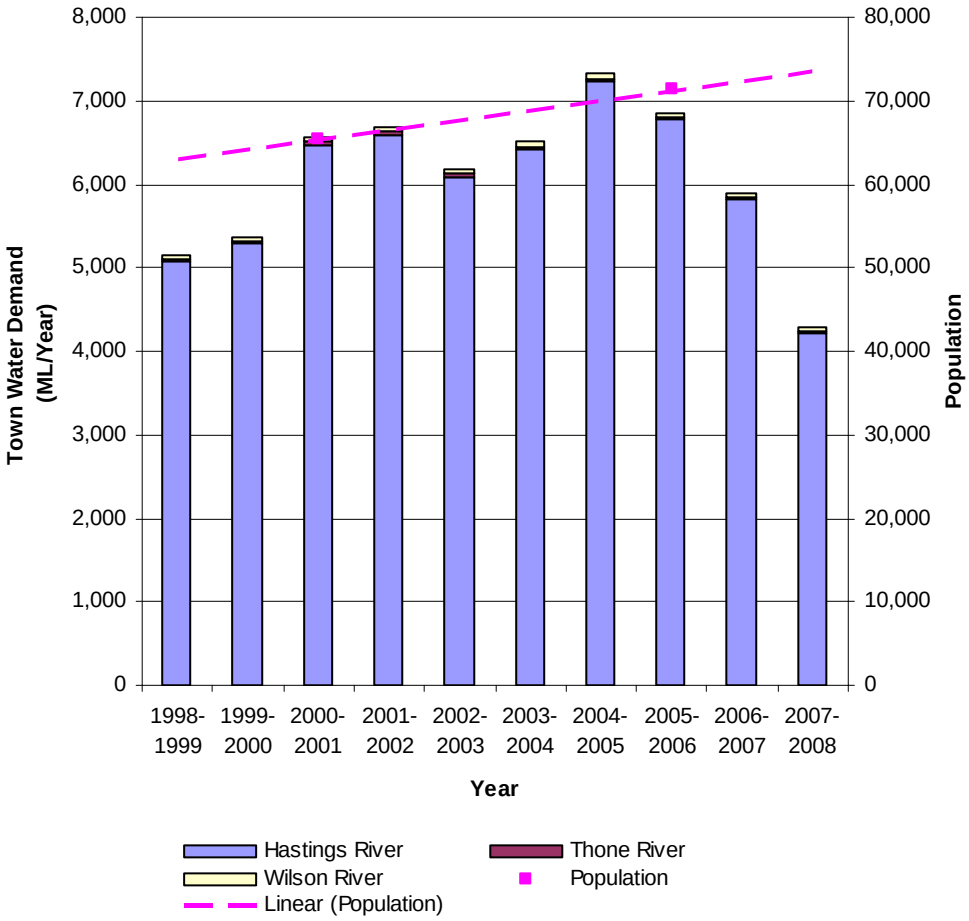
Port Macquarie-Hastings Council Water Supply System

Data in Table 5.1.1 and Figure 5.1.1 show that the total water extraction trend fluctuates depending on river flow and rainfall conditions. The reduction in extraction in 2007/08 was partly due to periods of low river flow and followed by periods of high, turbid flood flows. A total of 1437 Megalitres of stored water in the two off stream storage dams supplemented town water supply during 2007/08. However, it is important to note that the total volume of water used for potable purposes decreased by 7.8% in 2007/08 following a similar decrease in 2006/07. This overall decrease in water town demand is in response to community education program, the user pays water charging structure and permanent water conservation measures.

Other Water Abstraction

The Department of Water & Energy has provided data on the number of water licences and water allocations in the LGA during 2007/2008. The total number of surface water licences did not change at 322, while the total number of ground water licences increased from of 1146 to 1157 in 2007-2008. Surface water allocations, excluding town water fell marginally and are now similar to 2003/2004 allocations at 11,802ML/year.

Figure 5.1.1 – Town Water Demand Trends



Responses

(See also the Urban Water Section in the Human Settlement Chapter 2)

Port Macquarie-Hastings Council has implemented a range of responses in relation to surface water abstraction including:

- Utilisation of Cowarra Dam. This facility allows for sustainable river abstraction by allowing Council to rely on dam water during low flow conditions instead of river pumping
- Biological monitoring of the lower freshwater reaches and upper estuary of the Hastings River to assess impacts of river abstraction during drought conditions.
- Participation in the Hastings Water Users Group to ensure a holistic approach to surface water abstraction management
- Continuation of two tier “User Pays” water charges that reflect water use and encourage water conservation

The Department of Natural Resources manages a suite of responses to river water abstraction based around the framework provided by the Water Act 1912 and the Water Management Act 2000.

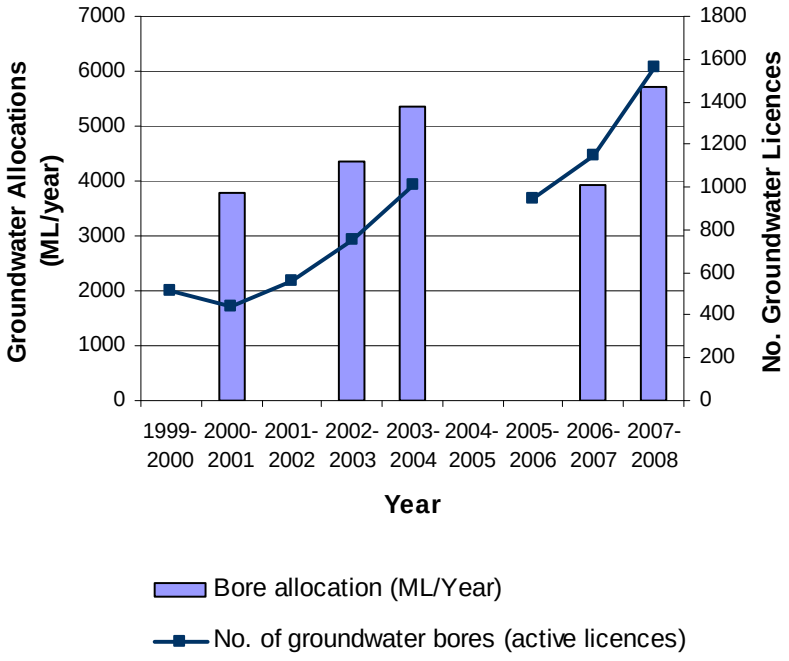
5.2 Groundwater Extraction

Trends

Data in Figure 5.2.1 shows that the number of groundwater bores licensed in 2007-2008 increased in comparison to 2006-2007, continuing a increasing trend since 2000.

Data on abstraction volumes are not available so alternatively, data on groundwater bore allocations is provided as a broad indicator. This information does not include allocations for the majority of bore licences, which are small users including domestic or stock watering licences. The information can therefore only be considered a general indicator of groundwater use.

Figure 5.2.1 – Groundwater Extraction Trends



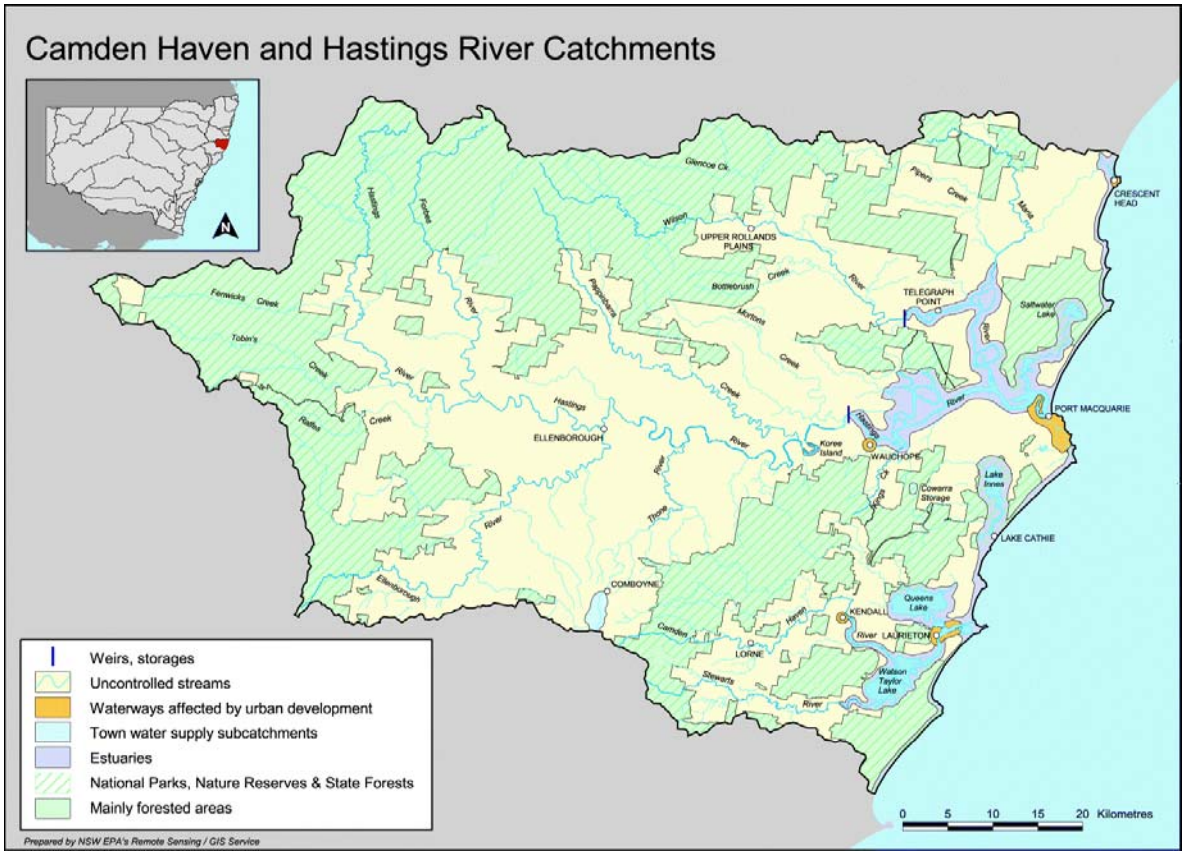
Responses

Responses that relate to groundwater abstraction are implemented primarily by the NSW Department of Environment & Climate Change who regulate groundwater management under the Water Management Act. The following responses from Port Macquarie-Hastings Council are also relevant:

- Consideration of groundwater issues as part of the development control and landuse planning process
- Implementation of Water Sensitive Urban Design principles into new urban development.
- Incorporation of 'deep soil zones' requirements into development control plans to allow for stormwater infiltration and groundwater recharge in urban areas.

5.3 Water Quality and Riverine Ecosystem Health

Figure 5.3.1 – Camden Haven and Hastings River Catchments



Trends

Figures 5.3.2 and 5.3.3 show the proportion of water samples collected and analysed by Council that failed to meet ANZECC water quality criteria. Nutrients include various forms of nitrogen and phosphorus and chlorophyll; and physicochemical parameters include water quality indicators such as dissolved oxygen, suspended solids, pH and salinity.

The results show a significant variability in the relationship between ambient water quality, both estuarine and fresh water, and the ANZECC water quality criteria. This variability is not unusual given the various conditions (e.g. wet periods, dry periods, during rainfall etc.) represented by the data and the variability of water quality in differing parts of the catchments.

The following observations are relevant:

- Exceedences of nutrient criteria in ambient estuarine waters generally declined until 2005-2006 with subsequent increase to 50% in 2006-2007, this being consistent with catchment run-off during the wetter conditions experienced during hat period. Exceedence of nutrient criteria in 2007-2008 were similar to that experienced in 2006-2007 for similar reasons.

- That nutrient water quality criteria are more frequently exceeded than physicochemical criteria and that estuarine waters affected by treated effluent discharges exceed water quality criteria more frequently that ambient sites. Filterable Reactive Phosphorus and Total Nitrogen (often linked to algal blooms) were the nutrients that most commonly exceeded ANZECC guidelines for STP affected estuaries.

- While the data does indicate that water quality fails to meet specific water quality criteria for varying proportions of samples, it should be recognised that the ANZECC criteria are 'generic' for south-eastern Australian waterways and therefore do recognise specific local geomorphologic characteristics that influence ambient water quality. It is also important to recognise that many of the ANZECC criteria exceedences are only minor (within an order of magnitude) and in general terms, river and stream water quality in the Port Macquarie-Hastings area is in a good state. This is reflected in the benthic habitat survey results discussed below.

Figure 5.3.2 – Comparison of Water Quality with ANZECC criteria for Nutrients

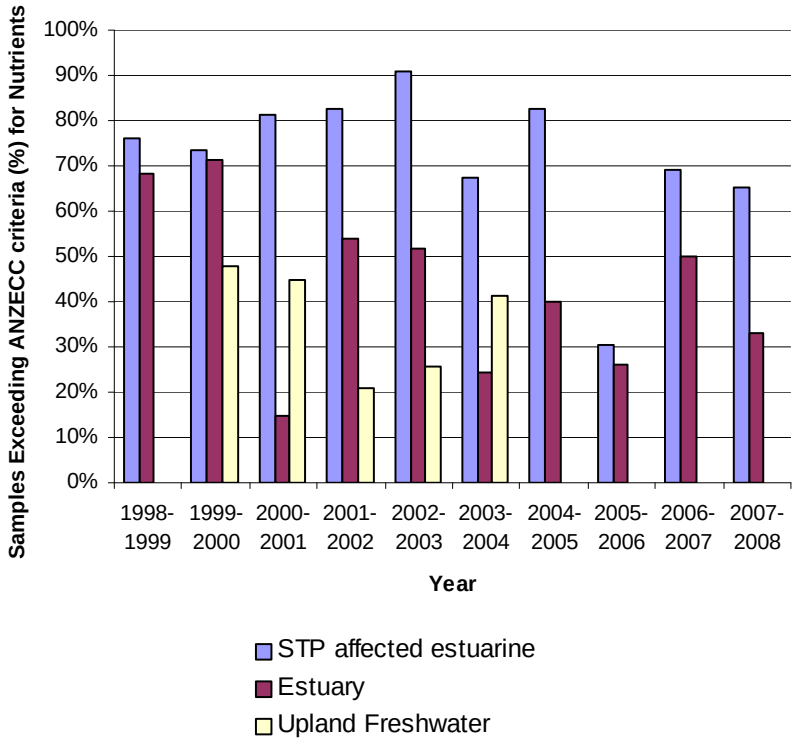
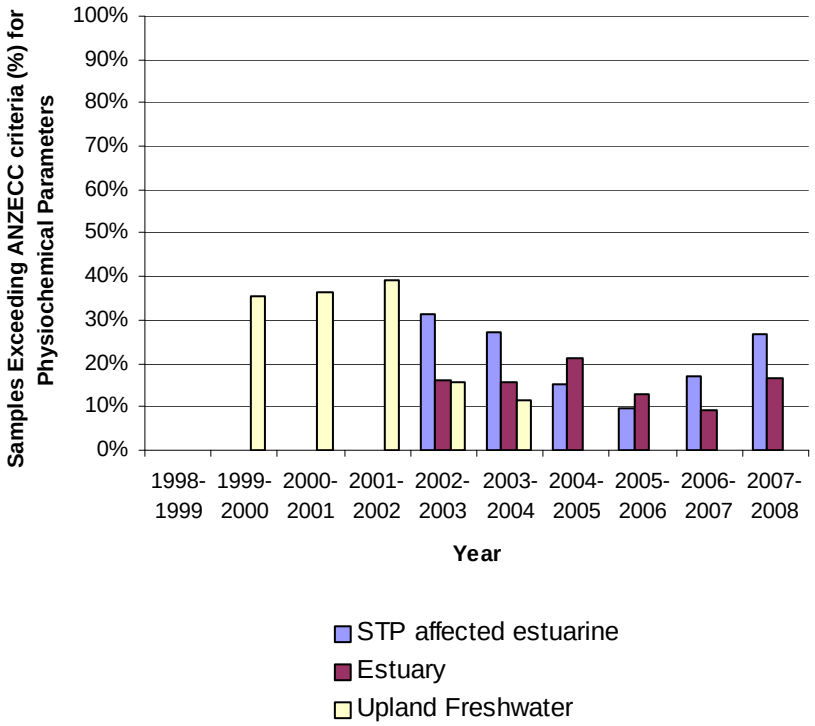


Figure 5.3.3 – Comparison of Water Quality with ANZECC criteria for Physicochemical



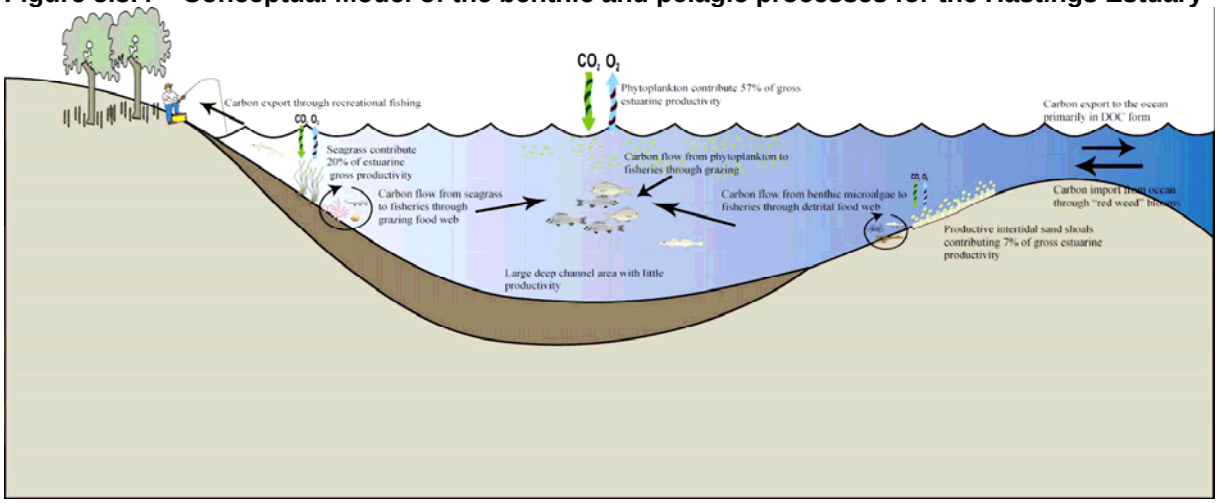
Benthic (or bottom dwelling) habitat mapping of the Hastings River and Camden Haven Estuaries was undertaken by Southern Cross University during February 2006 (Maher *et. al,* 2007) as a result of a partnership with Port Macquarie-Hastings Council. Habitat within the Hastings River Estuary was found to be dominated by channel sediments, comprising of marine sands in the lower estuary and fluvial sands and gravel in the upper estuary. The Camden Haven Estuary had extensive seagrass beds accounting for nearly 40% of the total instream benthic habitat. Three seagrass species are found within the Camden Haven Estuary, *Zostera capricorni*, *Halophila australis* and *Ruppia megacarpa*. Benthic and pelagic (of the sea) productivity measurements and macrofauna surveys were undertaken seasonally from winter 2006 to autumn 2007.

The Camden Haven and Hastings River Estuaries appear to be extremely healthy in terms of benthic habitats, productivity and macrofaunal abundance and diversity. From the results obtained during this study the Camden Haven Estuary has some of the most extensive seagrass communities in NSW on an areal basis indicating that in general the health of the estuarine ecosystem is excellent. The Hastings River has considerable less seagrass coverage due to the geomorphology of the estuary; however seagrass is present in the lower estuary where conditions allow. Productivity in the Camden Haven Estuary is dominated by benthic primary production with seagrass communities contributing significantly. Other important benthic habitats are the subtidal mud shoals within Queens and Watson Taylors Lakes. Within the Hastings River Estuary seagrass habitats are limited to the lower estuary, and contribute to ~50% of annual benthic productivity. Due to the high volume to surface area ratio of the Hastings River Estuary annual pelagic productivity is ~2 times higher than benthic productivity, however some skewing of the results may have been caused by the occurrence of a red-weed bloom during summer.

Figures 5.3.4 and 5.3.5 show a conceptual model of benthic and pelagic processes within the Hastings River Camden Haven Estuary respectively. A key difference between the two estuarine systems is the geomorphology, this has a direct impact upon the key habitat areas. Within the Camden Haven Estuary large shallow lakes dominate in-stream habitat allowing for extensive

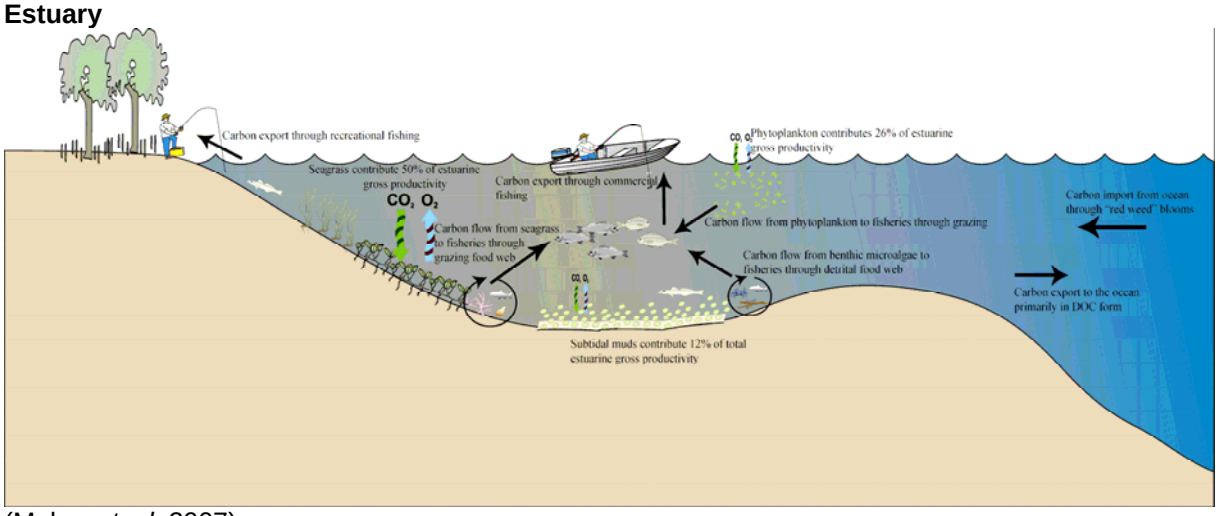
seagrass beds to thrive. These areas are very susceptible to changes in estuarine conditions. For example an increase in sediment transport from the upper catchment could decrease seagrass coverage significantly, changing the trophic (nutrient relationship) structure of the estuary as a whole, which would have implications for both commercial and recreational fisheries. In the Hastings River Estuary seagrasses are limited to shallow areas in the lower estuary and are more likely to be damaged by physical processes such as erosion. Pelagic productivity is proportionally more important in the Hastings River Estuary, consequently factors such as nutrient imports are key issues to maintain the current balance between benthic and pelagic production.

Figure 5.3.4 – Conceptual Model of the benthic and pelagic processes for the Hastings Estuary



(Maher *et. al,* 2007)

Figure 5.3.5 – Conceptual Model of the benthic and pelagic processes for the Camden Haven Estuary



(Maher *et. al,* 2007)

Responses

A number of responses to water quality and riparian ecosystem health are implemented by Council, NSW Government Agencies, Landcare and other community groups. Relevant responses for 2007-2008 include:

- Acid sulfate soil remediation works as discussed in Section 4.2
- Water quality monitoring in freshwater and estuarine reaches of waterways within the LGA
- Implementation of river remediation works along 16.5kms of riparian zone across the LGA, in both estuarine and freshwater areas in 2007-2008.
- Installation of stormwater quality improvement devices under Council's Urban Stormwater Management Plan
- Development of an integrated water quality database to ensure efficient use an acquisition of water quality data
- Enforcement of water pollution laws and development regulations
- Implementation of education and awareness campaigns relating to water pollution prevention, stormwater management and water conservation
- Monitoring of water quality in the Hastings and Camden Haven River Estuaries by local oyster growers under the NSW Shellfish Quality Assurance Plan

Chapter 6 – Biodiversity

6.1 Terrestrial Ecosystems and Species Diversity

Trends

Table 6.1.1 – Indicators for Terrestrial Ecosystems and Species Diversity

Type	Indicator	1998-1999	2003-2004	2007-2008
Response	Area of LGA conserved in NPWS estate (%)	*	24.7	24.9
State	No. of threatened fauna/flora species in the LGA (Threatened Species Conservation Act 1998)	*	118	134
State	Koala mortality and morbidity (admissions to Koala Hospital)	139	214	180

[+] Based on projects through Council and Landcare
* Information not available

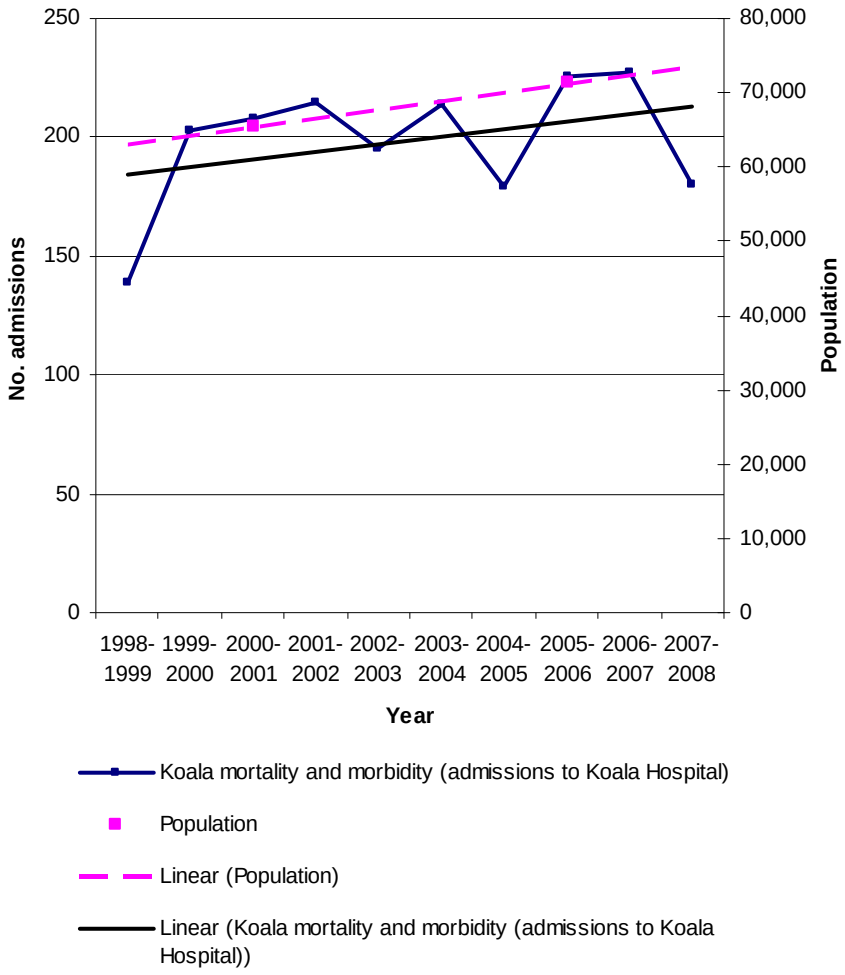
Table 6.1.1 presents the indicators for terrestrial ecosystem and species diversity relevant to the Port Macquarie-Hastings LGA.

A significant proportion of the LGA remains protected in National Parks estate.

There were 10 additional threatened species listed for the local government area during 2006-2007. The LGA also contains one endangered population and 10 types of endangered ecological communities.

Koala morbidity and mortality, measured as admissions to the Port Macquarie Koala Hospital, decreased between 2006-2007 and 2007-2008. However, an overall increasing trend of admissions is evident since 1998 as shown in Figure 6.1.1. The figures reveal that impacts on Koalas (as a sentinel species for urban impacts on native species) continue to be significant and are generally in line with human population growth and subsequent urban expansion.

Figure 6.1.1 – Koala Morbidity and Mortality



Responses

Threats to terrestrial ecosystems and species diversity are management locally by a number of organisations including Council, Landcare, Department of Environment and Climate Change, Northern Rivers Catchment Management Authority, Department of Natural Resources, Friends of Kooloonbung Creek and other community groups. Responses include:

- Implementation of site specific restoration programs
- Implementation of river remediation works along 16.5kms of riparian zone across the LGA, in both estuarine and freshwater areas in 2007-2008
- Implementation of education programs
- Implementation of planning laws and local planning instruments to protect terrestrial ecosystems and species diversity from inappropriate development
- Cane Toad round up in areas of known toad occurrence
- Feral animal and weed control (see Section 6.3)
- Operation of the Koala Hospital and associated programs by the Koala Preservation Society Inc.
- Tree planting initiatives on public land in partnership with local schools, Council and Landcare

6.2 Native Vegetation Clearing

Trends

Table 6.2.1 – Indicators for Native Vegetation Clearing

Type	Indicator	1998-1999	2003-2004	2007-2008
State	Extent of woody vegetation cover (% of land area in LGA)	72	71	70.8

The data in Table 6.2.1 is provided by the Department of Environment and Conservation for the purposes of SoE reporting and indicates a 1.2% decrease in woody vegetation cover in the LGA over the last seven years. This equates to an approximate loss of 44km^2 of woody vegetation from the LGA since 1998.

Responses

A range of organisations including Port Macquarie-Hastings Council, Department of Environment & Climate Change, Northern Rivers Catchment Management Authority, Landcare and other community organisations implement responses to native vegetation clearing, including:

- Assessment of habitat issues through the development control process for new developments by Council
- Regulation of native vegetation clearing through the Native Vegetation Conservation Act by Department of Environment & Climate Change
- Implementation of the Tree Preservation Order by Council
- Requiring supplementary planting where significant or Koala food trees have been approved for removal under the TPO
- Planting of native trees by Council in wildlife corridors in parks and reserves on an ad hoc basis
- Continued its support of local Landcare projects through Council's Environment Levy allocations
- Revegetation projects by Council, Landcare, local schools and other community organisations
- Property vegetation planning for rural landholders by NRCMA
- Revegetation work by individual landowners

6.3 Introduced Terrestrial Species

Trends

Table 6.3.1 – Indicators for Introduced Terrestrial Species

Type	Indicator	1998-1999	2003-2004	2007-2008
Pressure	No. of introduced animal species	17	17	17
Pressure	No. of introduced plant species	138	142	150
Response	No. of declared noxious weeds	**	22	31
Pressure	No. of complaints regarding noxious weeds	**	27	27

Trends in introduced terrestrial species indicators are provided in Table 6.3.1. Trends have remained relatively stable but still indicate a significant introduced species problem in the Port Macquarie-Hastings LGA.

No new weeds species were identified in the LGA during 2007-2008. The number of complaints to council about noxious weeds has remained stable since 2003-2004.

Responses

A number of organisations are responsible for implementing responses to reduce the impact of introduced species in local biodiversity including Port Macquarie-Hastings Council, Department of Primary Industries, Department of Environment & Climate Change, Landcare and other community based groups. The following are responses implemented during 2007-2008:

- Bitou Bush control projects in partnership between Council, Landcare and the Department of Environment & Conservation, including aerial spraying and biological control
- Inspection and treatment of roadsides for Giant Parramatta Grass
- Salvinia infestations on private lands have been controlled on a number of properties using a combination of mechanical, chemical and biological control methods
- Riparian weed control works on 45 sites focusing on Madeira Vine and Catsclaw Creeper have continued during 2006/2007 in locations such as Ellenborough, Wauchope, Long Flat and Lake Cathie
- Council officers carried out approximately 490 inspections of rural properties
- Council has continued educational and awareness activities including; general advice to landholders, inspection of retail outlets (e.g. pet shops, rural suppliers) with reference to the sale of potential aquatic weeds, production of 4,000 weed control calendars, awareness advertising in Town & Country newspaper supplement, a display at the Wauchope Alternate Farming Field Day and general presentations to local schools and Landcare groups to promote weed management
- Council has continued to play an active role in the development and implementation of the strategies prepared in weed control plans through the Mid North Coast Weeds Advisory Committee (e.g., Bitou Bush, Grounsel Bush etc) including the development of new Class 4 weed control fact sheets as required by the new Noxious Weeds Act
- Landcare have continued to address weed infestations through a range of projects implemented across the LGA by volunteers
- Council in partnership with the Hastings Valley Conservation Hunting Club and the NSW Game Council (DPI) continued implementation feral animal control programs on Council land at Thrumster and the Port Macquarie Waste Management Facility site targeting feral deer, feral cats, foxes and wild dogs
- Hastings Valley Conservation Hunting Club and the NSW Game Council (DPI) continued implementation feral animal control programs in partnership with landholders on private land.
- Council and Landcare have commenced an Indian Myna trapping program, harnessing the energy of volunteers through the Landcare network

- Council has undertaken works at major bush regeneration sites covering over 98 hectares of public land

6.4 Fire

Trends

Table 6.4.1 – Indicators for Fire

Type	Indicator	2003-2004	2004-2005	2007-2008
State	Area affected by major bushfire (ha)	Nil	Nil	2,328
Pressure	No. Permits issued by RFS for hazard reduction burning	1007	649	278

Data listed in Table 6.4.1 attempts to provide insight into trends associated with fire related impacts on biodiversity in the LGA. Since 2002-2003, only 3,702Ha of the local area have been affected by major bushfire (1,374Ha in 2006-2007 and 2,328 in 2007-20/08). This is a relatively minor area representing about 1% of the LGA.

The Rural Fire Service has provided data on the number of permits issued for burning off. This data is used to assist in understanding the potential local impact of fire on biodiversity. Data on permits for burning that have the potential to impact on biodiversity have declined since 2003-2004. It is likely that the introduction of tighter laws controlling native vegetation removal and the burning of waste vegetation in conjunction with dry conditions (high fire hazard) during much of the year have impacted on the number of permit applications over this period.

Responses

Responses to the impact of fire on biodiversity are implemented by the Rural Fire Service through the provisions of the Rural Fires Act 1997, which require an environmental assessment of hazard reduction works with the aim of protecting areas of high conservation value and threatened species.

6.5 Aquatic Ecosystems and Species Diversity

Trends

Table 6.5.1 – Indicators for Aquatic Ecosystems and Species Diversity

Type	Indicator	1998-1999	2003-2004	2007-2008
State	Number of aquatic endangered and vulnerable species	New Indicator	5	5

Threatened aquatic species that are known to occur in the area include the Black Cod, Great White Shark, Grey Nurse Shark, Oxleyan Pygmy Perch and the Green Sawfish.

Responses

Responses to manage and protect aquatic ecosystems and aquatic species diversity are principally implemented by NSW Department of Primary Industries (Fisheries) through the Fisheries Management Act and various recovery plans and marine reservation systems. The following activities of Port Macquarie-Hastings Council are indirect responses:

- Implementation of development and landuse planning controls that prevent impacts of landuse on aquatic environments, eg, setbacks to waterways, water pollution controls, stormwater treatment

- Implementation of stormwater quality management strategies
- Implementation of Estuary Management Plans that include actions to protect the aquatic environment
- Water pollution regulation and education
- Implementation of Estuary Management Plans that include actions to protect the aquatic environment
- Water pollution regulation and education

6.6 Introduced Aquatic Species

Trends

Table 6.6.1 – Indicators for Introduced Aquatic Species

Type	Indicator	1998-1999	2003-2004	2007-2008
State	No. Introduced Aquatic Species*	3	4	4

*Aquatic animals only, relevant plant species included in Terrestrial indicators

Three introduced fish species have been identified in Hastings freshwater systems. These are carp (*Cyprinus carpio*), mosquito fish (*Gambusia holbrooki*) and Goldfish (*Carassius auratus).* In addition the Pacific Oyster (*Crassostrea gigas*), a bivalve mollusc, is found in the estuaries of the LGA. Information on the true extent of introduced aquatic species (eg, ballast water introductions in marine environments) is not currently available.

Photo: NSW Fisheries
Common name:Mosquito fish
Scientific Name:Gambusia holbrooki
Size:Females to about 60 mm, males to about 35 mm

Responses

Responses to manage and prevent further exotic introductions are principally implemented by NSW Department of Primary Industries. Local responses implemented by Council in relation to aquatic weeds are addressed in conjunction with terrestrial weed control initiatives as outlined in Section 6.3.

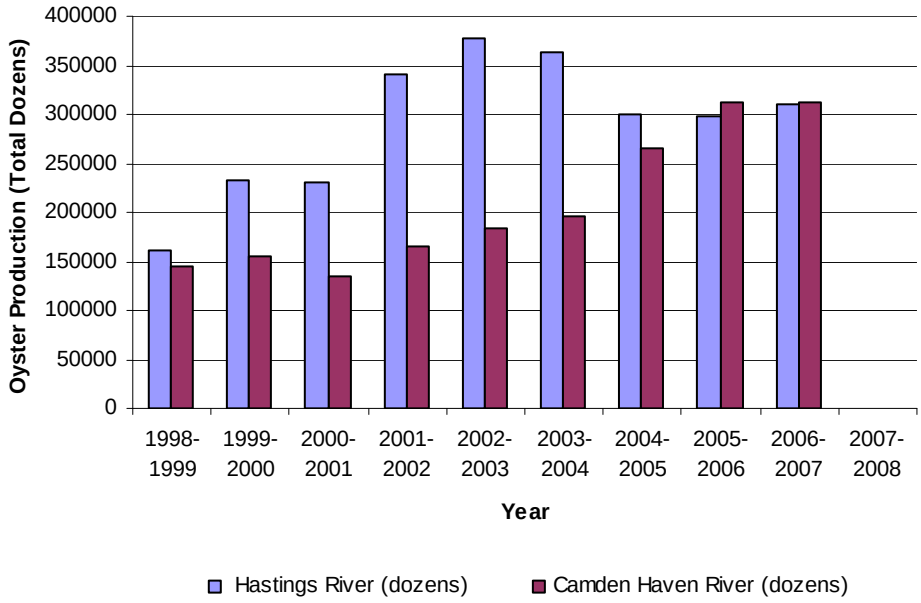
6.7 Aquatic Harvesting

Trends

Indicators of aquatic harvesting activity are a potential measure of the ability of the Hastings & Camden Haven River estuaries to support a sustainable commercial fishery. It can also be used, with caution, as an indicator of estuary health. A lack of data on catch effort is a limitation to this indicator.

NSW Department of Primary Industries data on oyster production is shown in Figure 6.7.1. Statistics for 2007-2008 were not available for the preparation of this report. The published data reveals that there has been a steady increase in production in the Camden Haven estuary since 2000-2001, with a minor plateau in production in 2006-2007. Production rates in the Hastings estuary increased slightly in 2006-2007.

Figure 6.7.1 – Indicators for Aquatic Harvesting



Responses

Responses relevant to this issue are implemented by a number of agencies including Council, NSW Department of Primary Industries (Fisheries) and NSW Food Authority and are generally associated with water quality protection as detailed above in Chapter 5.

Glossary

ABS	Australian Bureau of Statistics
ANZECC	Australian and New Zealand Environment Conservation Council
ASS	Acid Sulfate Soils
AWTS	Aerated wastewater treatment system
DCP	Development Control Plan, which, under the Environmental Planning and Assessment Act 1979, is a detailed policy of Council to support control of development together with LEPs.
DEC	NSW Department of Environment and Conservation (formerly EPA and NPWS)
DNR	NSW Department of Natural Resources (formerly part of DIPNR)
DoP	NSW Department of Planning
EPA	NSW Environment Protection Authority
GIS	Geographical information system
HUGS	Hastings Urban Growth Strategy 2001
KL	Kilolitres (1000 litres)
LEP	Local Environmental Plan
LGA	Local government area
ML	Megalitres (million litres)
NPWS	NSW National Parks & Wildlife Service
NRCMA	Northern Rivers Catchment Management Authority
OSM	On-site sewage management system
RTA	NSW Roads & Traffic Authority
SoE	State of the Environment
SQID	Stormwater Quality Improvement Device
STP	Sewerage Treatment Plant
TPO	Tree Preservation Order

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