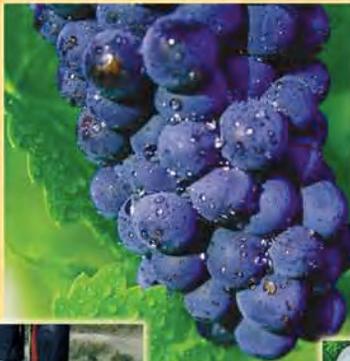




PORT MACQUARIE  
HASTINGS

*A sustainable high quality of life for all*



Port Macquarie-Hastings Council 2004-2005 annual report

Part B: state of the environment report

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## PORT MACQUARIE–HASTINGS AT A GLANCE

The Port Macquarie-Hastings local government area (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. State Forests and National Parks occupy a large proportion of the area.

The natural features of 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 across in a westerly direction 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 generally westward to the Great Divide. The area has two main river systems, the Hastings and Camden Haven Rivers.

The topography of the area is very 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 current population for the Port Macquarie-Hastings LGA is estimated at 71,100, and is anticipated to grow to 97,800 by the year 2021.

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 40,500 people and serves as a major tourist destination in addition to being the major regional centre for the area. Port Macquarie is a key growth area for the region, with its population expected to grow to 52,200 by the year 2021.

The township of Wauchope, 21 kilometres or 20 minutes by car from Port Macquarie, serves as the regional centre for the inland area, particularly for the rural communities and the associated agricultural industries. Wauchope has an estimated population of about 5,150 people.

The villages of Lake Cathie and Bonny Hills maximise the natural attributes of their location. The population of the area is approximately 4,750 and is growing rapidly.

The Camden Haven is located at the southern extremity of the LGA (population approximately 7,900) 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, Pembroke, Ballengarra, Rollands Plains, Upper Rollands Plains, Telegraph Point). The rural population of the LGA is about 12,800 persons.

## ABOUT SoE 2004-2005

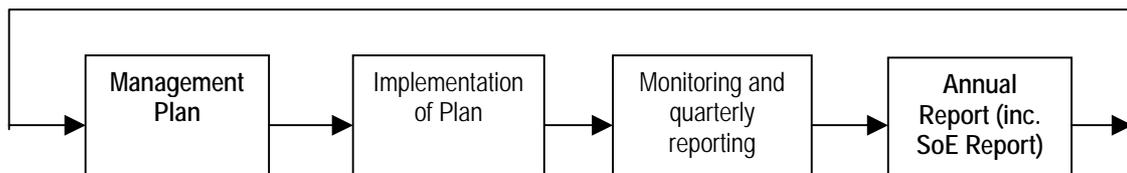
### PURPOSE

The Port Macquarie-Hastings Council State of the Environment Report (SoE) 2004-2005 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 councillors, and a *supplementary* SoE report must be prepared in intervening years.

The State of the Environment reports 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 2004-2005 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 State of the Environment Report 2003-2004.

## CHAPTER 1 – TOWARD ENVIRONMENTAL SUSTAINABILITY

### 1.0 Assessing Progress

An inherent purpose of State of the Environment Reporting is to enable the assessment of progress towards environmental 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 environmental sustainability on the basis of the data presented in this report.

The Port Macquarie-Hastings is progressing towards environmental 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
- Residential sector energy and water efficiency

The following key strategies will require continued support:

- Hastings Drought Management Plan
- Hastings Reclaimed Water Project
- Hastings Waste Management Strategy 1999
- Hastings Effluent Management Strategy 1998
- Hastings Urban Growth Strategy 2001
- Camden Haven Urban Growth Strategy 2003
- Greenhouse Action Strategy 2003
- Acid Sulfate Soils Remediation Program
- 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 environmental 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**

<b>Issue</b>	<b>Recommended Response</b>	<b>Priority</b>
<b>Human Settlement</b>		
Population growth	Determine an ultimate landuse footprint for the LGA based upon environmental constraints and community social needs.	Very High
Solid Waste	Commercial and construction waste minimisation, resource recovery and recycling	High
Wastewater Management	Implementation of Village Sewerage Schemes	High
Increasing Motor Vehicle Usage	Council leadership in green corporate fleet management	High
Urban Noise	More effective use of land use buffer zones	Medium
	Clearer policy direction to inform community about neighbourhood noise	Medium
<b>Atmosphere</b>		
Air Quality	Development of Public Transport Systems	Medium
<b>Land</b>		
Land use	Future urban release and rural residential release areas linked to sustainable landuse footprint.	Very High
<b>Water</b>		
Water Quality & Riverine Ecosystem Health	Review and integration of Council water quality programs to ensure effective catchment based monitoring and reporting	Medium
	Integration of environmental rehabilitation works in accordance with EMPs, River Styles Report and Catchment water quality reports	Medium
	Fast tracking of environmental rehabilitation components of Estuary Management Plan Implementation	Medium
<b>Biodiversity</b>		
Terrestrial Ecosystems & Species Diversity	Increased funding for terrestrial ecosystem rehabilitation projects	High
	Development of a Biodiversity Strategy	High
Native Vegetation Clearing	Up-date aerial photography for entire LGA	Medium
	Transfer private property tree management from Tree Preservation to development consent regulatory framework	Medium
	Development of a Vegetation Management Strategy	High
Introduced Species	Increased funding for Weed Control Programs on private and public land	High
	Development and Implementation of a Feral Animal Control Programs for Council land.	Very High
Aquatic Ecosystems and Species Diversity	Increased emphasis on aquatic ecosystem rehabilitation projects (through EMPs etc)	Medium

Priorities set for each Recommended Response are based upon the importance of the issue, the level of environmental pressure being experienced, community concern and the effectiveness of existing responses. Community concern factors have been determined from data contained in 'Who Cares About the Environment in 2003' (DEC, 2003) and *Community Attitudes to Service Provided in the Hastings Area* (Hunter Valley

Research Foundation, 2004). Priorities are assigned a ranking of Very High, High and Medium.

Very High priority issues should ideally be addressed in the next 1-2 years; High priority issues in the next 3-4 years and Medium priority issues within 4-6 years.

The issues identified in Table 1.1 will be reviewed by Council and incorporated into future management plans.

## CHAPTER 2 – HUMAN SETTLEMENT

### 2.1 Population and Settlement Patterns

#### TRENDS

**Table 2.1.1 – Indicators for Population and Settlement Patterns**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Population (ABS)	<b>61,914</b>	63,966	65,378	67,024	68,423	<b>69,737</b>	<b>71,100</b>
State	Population Density (persons/km <sup>2</sup> )	<b>16.77</b>	17.32	17.7	18.15	18.53	<b>18.88</b>	<b>19.25</b>
State	Population Density Coastal area (persons/km <sup>2</sup> )	<b>25.8</b>	26.7	27.2	27.9	28.5	<b>29.2</b>	**
State	% A/TSI <sup>+</sup> of population	<b>1.6</b>	1.6	1.6	2.0	2	**	**
State	% NESB <sup>++</sup> of population	<b>2.9</b>	2.9	2.9	3.1	3.1	**	**
State	Median age – Years	<b>41</b>	41	41	43	43	**	**
State	Unemployment rate %	<b>9.8</b>	8.6	16.1	11	10.9	**	**

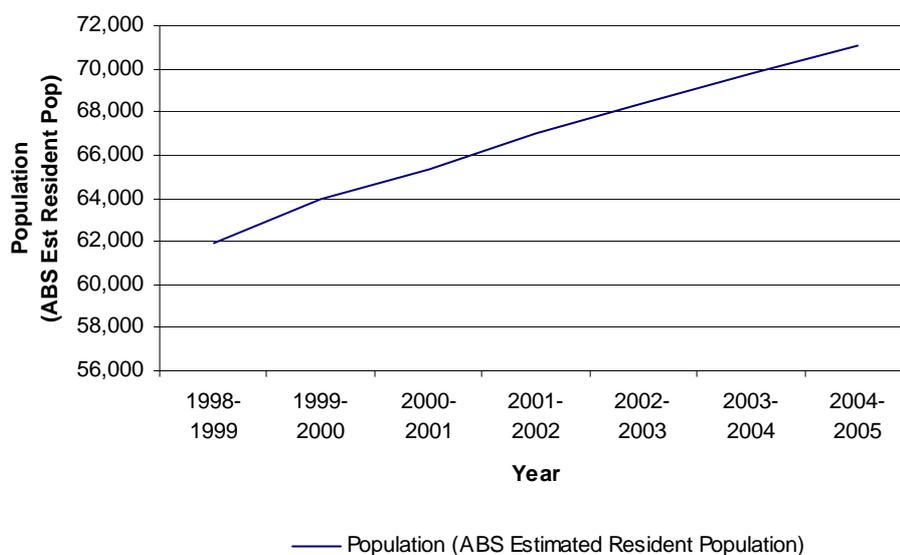
\*\* Information not available at time of publication.

+ Aboriginal/Torres Strait Islander

++ Non English Speaking Background

The total population for 2004-2005 is an estimate based on Australian Bureau of Statistics (ABS) population and growth data for previous years. The data, presented as Figure 2.2.1, shows the continued population growth of the LGA. Population growth in the Port Macquarie-Hastings continues to be amongst the highest growth rates in regional NSW.

**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
- Hastings Effluent Management Strategy
- Hastings Drought Management Plan
- Hastings Waste Management Strategy 1999
- Hastings Effluent Management Strategy 1998

In addition to broader strategies, detailed plans are being developed to ensure sustainable growth in the major urban expansion areas at Rainbow Beach (Lake Cathie/Bonny Hills) and Thrumster.

## 2.2 Urban Water

### TRENDS

**Table 2.2.1 – Indicators for Urban Water**

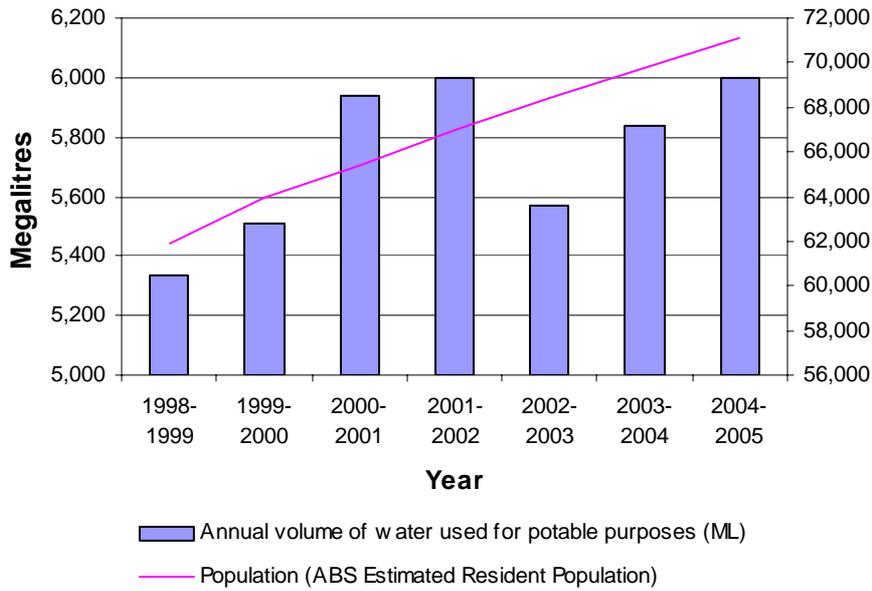
Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Potable water usage per property (KL)	<b>248</b>	251	264	259	233	<b>230</b>	230
State	Annual per capita potable water use (KL)*	<b>86</b>	87	91	90	81	<b>84</b>	84
State	Annual volume of water used for potable purposes (ML)	<b>5,336</b>	5,512	5,938	6,001	5,569	<b>5,839</b>	6,002
Response	% Treated effluent reused	<b>0.3</b>	0.4	1.1	1.3	1.3	<b>3.9</b>	6.6
State	Number of water restriction breaches reported to Council	NEW INDICATOR					<b>92</b>	95

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

While increases in potable water use have occurred over the past six years, the reduction in demand caused by water conservation measures during the recent drought is clearly evident as shown by Figure 2.2.1. Water restrictions imposed between 2002 and 2004 realised dramatic reductions in water consumption.

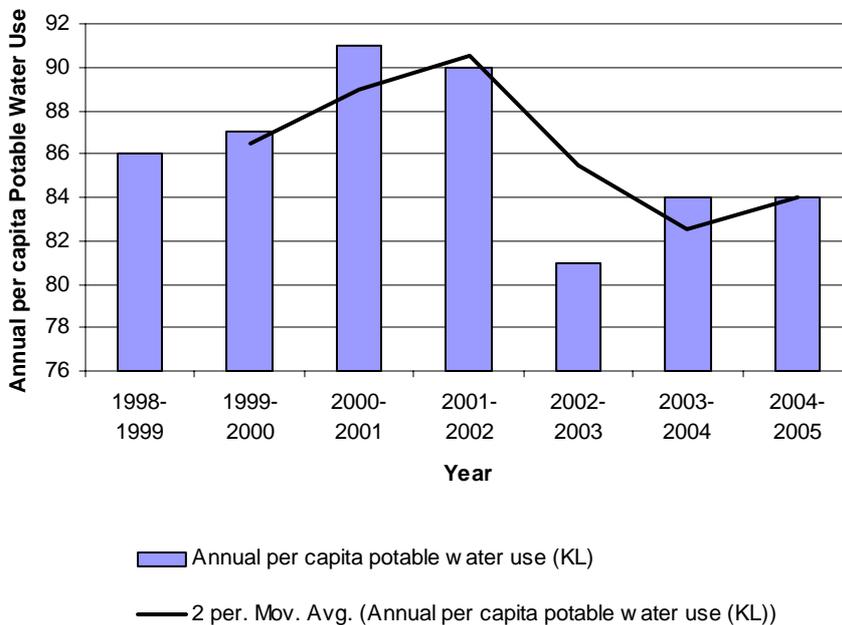
During 2004-2005 there was a 2.8% increase in potable water usage. However, the data indicates that this increase can be attributed to population growth, given that per capita and per property consumption rates have remained stable.

**Figure 2.2.1 – Potable Water Use Trends**



Per capita potable water consumption rates remain at their lowest since 1998. This indicates the success of current water conservation strategies. Figure 2.2.2 provides a graphical comparison of per capita potable water consumption rates.

**Figure 2.2.2 – Per Capita 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:

- Implementation of new water pricing that reflects the value of the water resource
- Commencement of implementation of reclaimed water reuse systems
- Public education
- Demand management
- Permanent water conservation measures and water restrictions
- Pressure and leakage reduction
- Water sensitive urban design
- Improvements to existing water supply system
- Off-creek storages
- Water treatment

## 2.3 Transport

Transport and travel have major environmental and other costs including:

- Consumption of significant amounts of non-renewable resources (especially fossil fuels)
- Producing of air pollution and greenhouse gas emissions
- Noise, visual and other impacts on urban amenity
- Runoff from roads impacting upon water quality
- Impacts on biodiversity as a result of fragmentation of natural ecosystems by roads.

### TRENDS

**Table 2.3.1 – Indicators for Transport**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of vehicles registered in LGA (RTA data)*	<b>45,692</b>	49,112	50,013	53,712	56,486	<b>58,722</b>	**

\* Includes trailers

\*\*Information not available

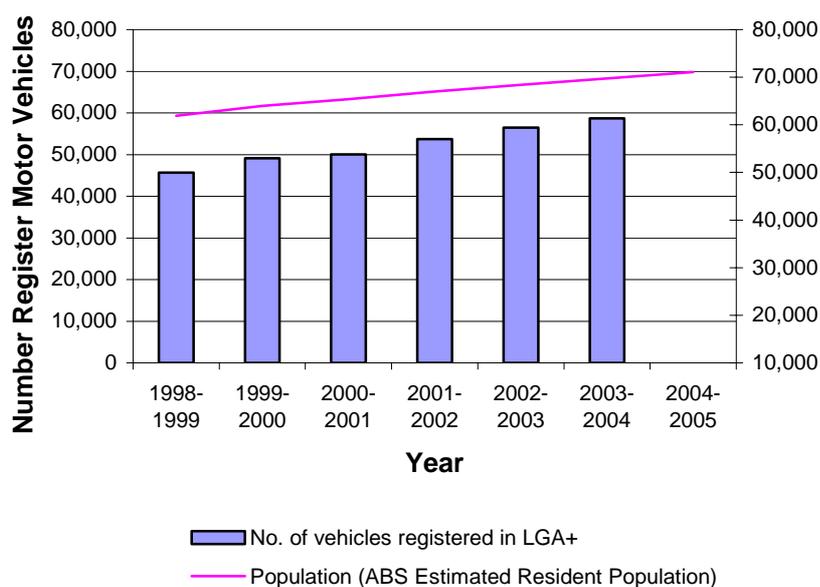
The most available and reliable indicator of transport impacts for the Port Macquarie-Hastings area is the number of registered motor vehicles in the LGA. This data has been sourced for past SoE reports from Census data. However, this report provides updated data directly from Roads & Traffic Authority (RTA) reporting and provides for more accurate information.

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

### RESPONSES

Responses implemented by Council in relation to transport issues include:

- Continuation with Council's cycleway program
- Ensuring provision for public bus transport into urban design
- Implementing the Regional Cycleway Program

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

## 2.4 Waste Management

### 2.4.1 SOLID WASTE

#### TRENDS

**Table 2.4.1.1 – Indicators for Solid Waste**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Solid waste produced (tonnes)	<b>76,000</b>	81,000	51,665	59,362	63,597	<b>71,445</b>	61,208
State	Solid waste landfilled (tonnes)	**	68,752	32,418	31,051	42,774	<b>37,016</b>	35,813
State	Volume of domestic waste (tonnes)	**	**	13,073	15,832	18,746	<b>19,813</b>	20,315
State	Solid waste generated per person per year (tonnes)	<b>1.2</b>	1.27	0.5	1.09	0.98	<b>1.03</b>	1.02
State	% of solid waste diverted from landfill	<b>11.5%</b>	15%	37%	47%	43%	<b>43%</b>	37%
State	Solid waste recycled (tonnes)	**	12,248	19,247	28,311	27,859	<b>30,653</b>	22,850

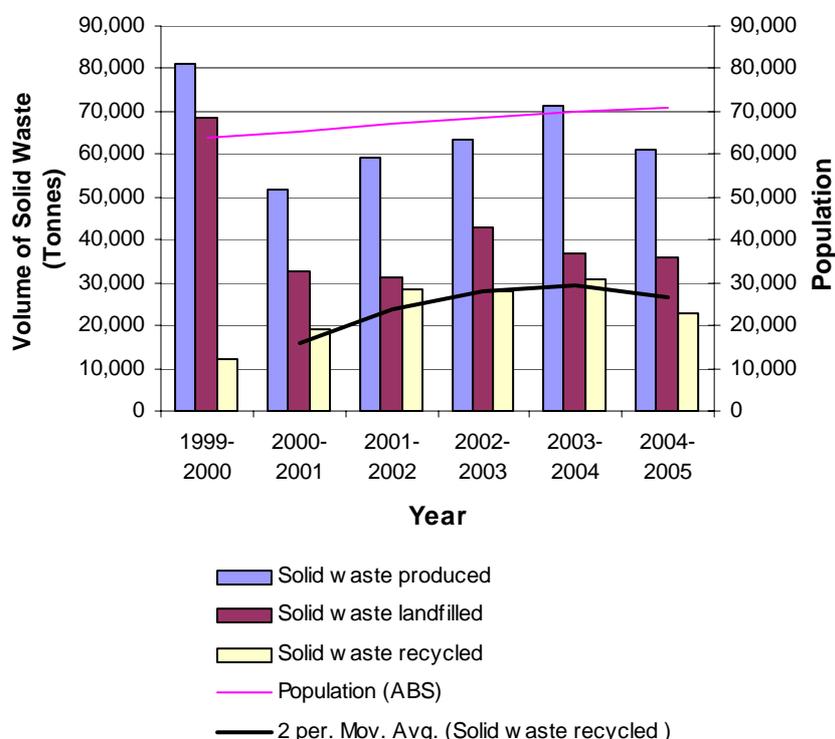
\*\* Information not available

Despite some data inaccuracies resulting from changes in waste data collection systems around 2000, a number of overall solid waste management trends are emerging.

It is clear that the volume of solid waste generated is directly influenced by population growth. This trend in growth is being matched by an increase in the volume of waste recycled/diverted from landfill. For the past five years, between 37% and 47% of solid waste generated has been recycled. The volume of waste generated in the LGA per capita appears to have stabilised over the last three years.

Figure 2.4.1.1 provides a graphical representation of waste generation statistics, population growth and recycling trends.

**Figure 2.4.1.1 – Solid Waste Trends**



## RESPONSES

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

- Review and update of waste processing and recycling contract to ensure a greater percentage of waste is recovered for recycling and/or reuse. The review and ultimate award of the contract will see the construction of a new resource recovery facility at the Cairncross Waste Management Facility by mid 2006.
- Food waste capture initiatives have been included in the new waste collection contract, which commences in July 2006.
- Facilitation of a new commercial organics collection, offered by a local contractor, as a result of a trial program in 2004.
- Investigation of construction and demolition waste recycling opportunities.
- Commenced construction of a new waste transfer station at Wauchope to enable the Closure of Wauchope landfill in October 2005.
- Participation in several other recycling schemes, eg, Planet Ark's 'Clean up mobile phones and program and VISY's 'Recycling Plastic Oil Container' scheme.
- Continued participation in the regional Midwaste group.

## 2.4.2 LIQUID WASTE

### TRENDS

**Table 2.4.2.1 – Indicators for Liquid Waste**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Volume of wastewater received at sewerage treatment plants (ML)	<b>6,979</b>	6,285	6,818	6,075	5,310	<b>6,381</b>	7,489
State	Volume of treated wastewater discharged sewerage treatment plants to receiving waters (ML)	<b>6,953</b>	6,258	6,740	5,999	5,240	<b>6,132</b>	6,995
Response	Treated wastewater reused (%)	<b>0.3</b>	0.4	1.1	1.3	1.3	<b>3.9</b>	6.6
State	Volume of wastewater per person per capita in sewered areas(KL)	<b>138.6</b>	124.5	132.4	112.6	96.5	<b>111.9</b>	126.3
State	No. of on-site sewerage management systems (e.g. septics)	**	4,166	4,200	4,249	4,299	<b>4,479</b>	4,829
Response	No. of compliance inspections of on-site sewerage management systems by Council	**	**	299	779	222	<b>170</b>	234
Response	No. of inspections of on-site sewerage management systems by AWTs contractors	**	471	1,016	1,135	1,380	<b>2,288</b>	2,900
State	No. of approved trade waste systems	<b>341</b>	416	439	475	494	<b>483</b>	489
Response	No. of compliance inspections of trade waste systems	**	**	1,760	1,760	1,147	<b>800</b>	980
State	% Compliance of trade waste systems	**	**	97%	>95%	98%	<b>&gt;90%</b>	90%

\*\* Information not available

### Reticulated Sewerage System

Figure 2.4.2.1 shows the trends in treated wastewater volumes for the past seven years. Volumes of wastewater treated and discharged are influenced by stormwater infiltration and as such relatively low volumes can be noted for the dry period between 2001-2002 and 2003-2004. The moving average trendline applied in this figure is influenced by these climatic factors but indicates stable annual volume of wastewater discharged to the environment over the period. This trend can be partially attributed to the increase in reuse of treated wastewater. Reuse has risen from 0.3% in 1999 to 6.6% in 2005.

Overall decreases in wastewater generation are confirmed by per capita data as shown in Table 2.4.2.1 above.

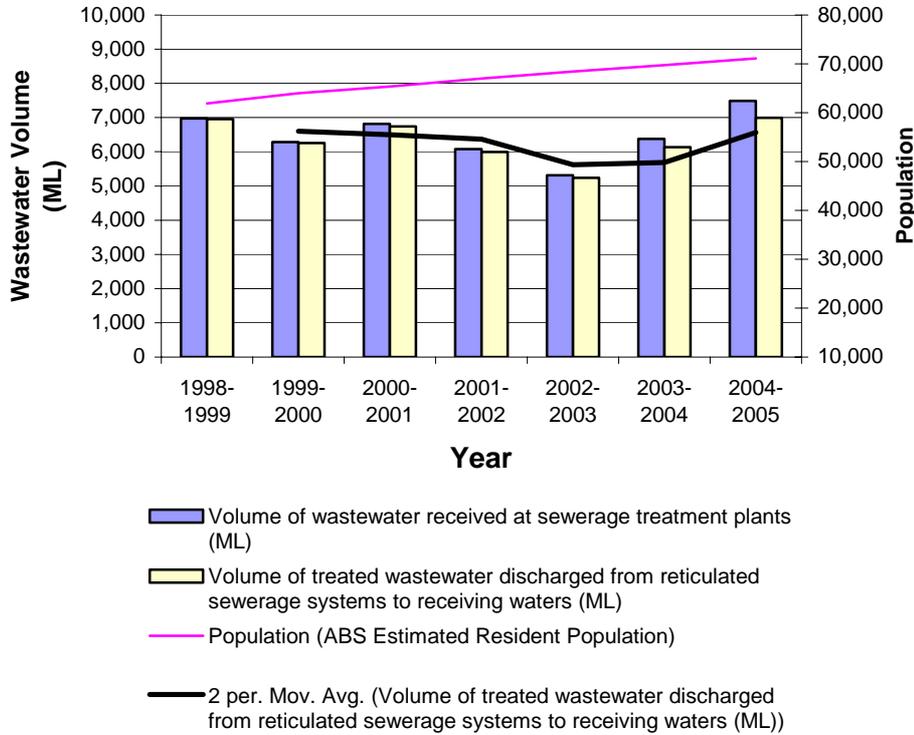
### On-Site Sewage Management

The number of on-site sewage management systems continues to grow and is a direct reflection of increasing rural and rural residential development and settlement.

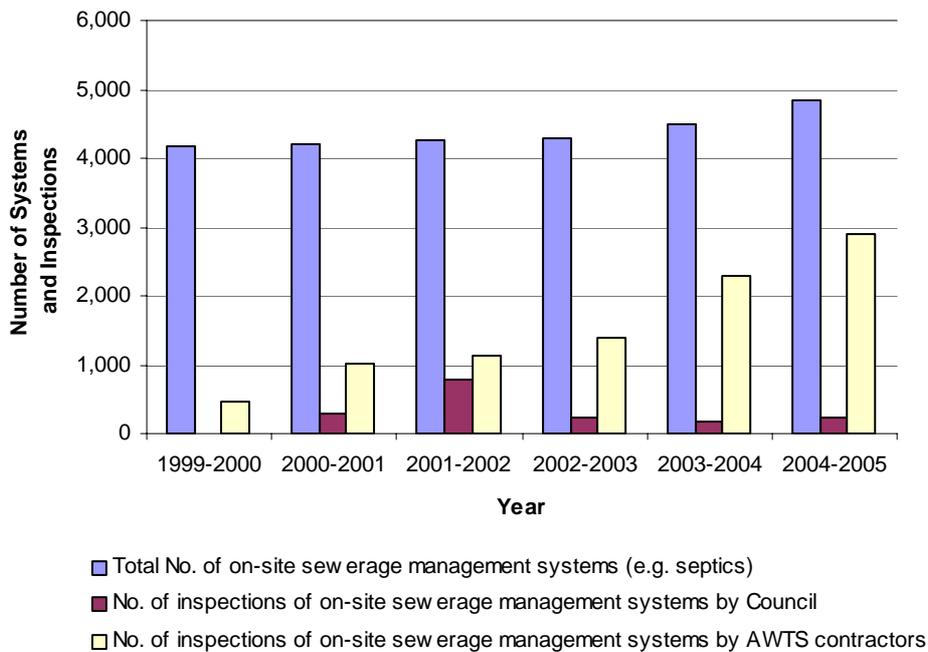
Inspections of aerated wastewater treatment systems by service contractors continue to increase. This increase is attributed partially to an increase in the number of these systems in the LGA and mainly due to a more efficient monitoring and regulatory regime implemented by Council.

The number of inspections by Council officers has increased slightly over the past 3 years. However, 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**



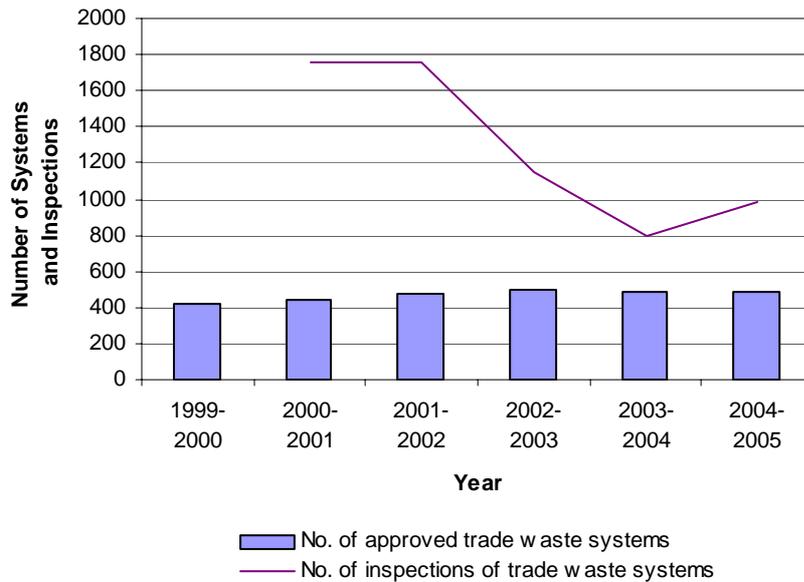
**Figure 2.4.2.2 – On-Site Sewage Management Trends**



## Trade Waste

The number of trade waste systems installed to prevent the discharge of harmful substances to the sewerage system is growing at a low rate and is a reflection on the increase of commercial and industrial development in the LGA. Council continues proactive compliance inspections to ensure optimal performance of these systems and therefore minimise impact on the sewage treatment process and the receiving environment. These trends are depicted in Figure 2.4.2.3.

**Figure 2.4.2.3 – Trade Waste Trends**



## RESPONSES

### Reticulated Sewerage System

Recent responses include:

- Review of Environmental Factors into the provision of a reclaimed water system for the Camden Haven based on augmentation of the Bonny Hills Sewerage Treatment Plant.
- Continued development of treated wastewater reuse markets.
- Continued investigation of options to minimise impact of private swimming pool discharges into the reticulated sewerage system.
- Production of an Environmental Impact Statement for the proposed Thrumster sewerage treatment plant to service the proposed Thrumster urban expansion area. Integral to the system will be a variety of potential reuse options including dual reticulation to urban areas, irrigation of sporting and recreational areas and acid sulfate soils remediation.
- Commencement of the Port Macquarie Reclaimed Water Project that will see wastewater treated to a high quality standard and reticulated for irrigation of sporting fields and use by commercial operators.

### 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 and ensuring defects are rectified.
- Reviewing the standards for accreditation of AWTS service contractors.
- Membership of regional local government body (from Central Coast to Mid North Coast inclusive) to ensure consistency and efficiency in on-site sewage management issues.
- Introduction of standard design specifications for surface and subsurface irrigation of effluent.
- Formalisation of the approval and inspection program for new OSM installations.
- Review of technical standards for on-site sewage management.
- Establishment 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

## Trade Waste

Responses to trade waste issues include:

- Proactive compliance inspection of installed 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.

## 2.5 Heritage

### TRENDS

**Table 2.5.1 – Indicators for Heritage**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of protected European heritage items	<b>132</b>	132	152	153	153	<b>153</b>	153
State	No. of protected Aboriginal heritage items	<b>198</b>	220	220	366	374	<b>385</b>	385
State	Total No. of protected heritage items	<b>330</b>	352	371	519	527	<b>538</b>	538

Information supplied by the Department of Environment and Conservation reveals that there were no additional sites of Aboriginal or European heritage afforded a legal conservation status during 2004-2005.

### RESPONSES

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

### European Heritage

- Heritage Bus Tours (4 tours of Port Macquarie/Rawdon Island/Wauchope and 1 tour of Port Macquarie/Telegraph Point).
- Continued Local Heritage Assistance Fund (year 7).
- Continued Heritage Advisory Program.
- Port Macquarie Archaeological Sites mapping.
- Conservation works to 9 graves - Port Macquarie's Second Burial Ground.
- Heritage Festival 2005 – 22 Community and Heritage events.
- Updated Publications Catalogue.
- Update Consultants and Tradespersons Register.
- Commenced implementation of Hamilton Green Management Plan.



### Aboriginal Heritage

- Draft Aboriginal Heritage Strategy development.
- Reconciliation Strategy development (contains an Aboriginal Heritage component).
- Three Brothers Education and Awareness project.
- Aboriginal heritage assessment as part of the development assessment process.
- Incorporation of Aboriginal heritage awareness into Heritage Week.
- Cowarra Dam Aboriginal heritage consultation and partnership.
- Incorporation of Aboriginal heritage education and awareness into the Timbertown stories project.

## 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	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-5005
State	No. of noise complaints: Total	**	538	537	574	524	<b>460</b>	452
State	No. of noise complaints: Domestic (excl. barking dogs)	**	**	97	93	44	<b>81</b>	86
State	No. of noise complaints: barking dogs	**	**	402	444	457	<b>332</b>	315

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of noise complaints: Building sites - working outside hours	**	**	13	22	15	<b>29</b>	24
State	No. of noise complaints I: Industrial/Commercial	**	**	25	15	8	<b>18</b>	27

\*\* Information not available.

Table 2.6.1.1 provides details of the number and nature of noise complaints received by Port Macquarie-Hastings Council. An overall decrease in the number of noise complaints is apparent and is depicted in Figure 2.6.1.1. This is a positive trend given increases in growth, population density and construction activity, which are all causes of noise impact.

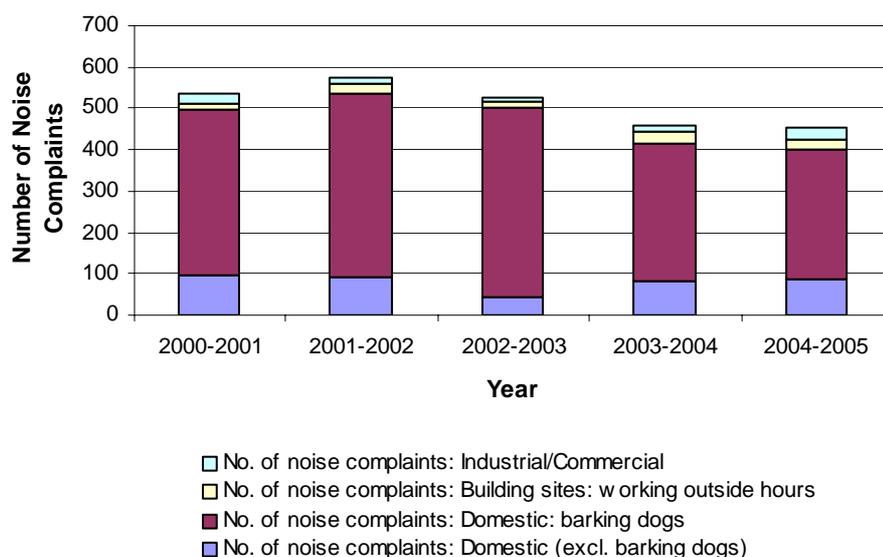
Trends in the type of noise complaints received are less obvious given the short-term variability in complaint numbers. However, it is clear that the dominant source of noise complaint is barking dogs. Anecdotal evidenced suggests that impacts are primarily occurring in urban areas where population densities are greatest.

Increases in the number of vehicle 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.

## 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 (i.e. pamphlets, newspaper articles etc)
- 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 landuses comply with airport noise forecast requirements

**Figure 2.6.1.1 – Noise complaints received by Council**

## 2.6.2 ODOUR

### TRENDS

**Table 2.6.2.1 – Indicators for Odour**

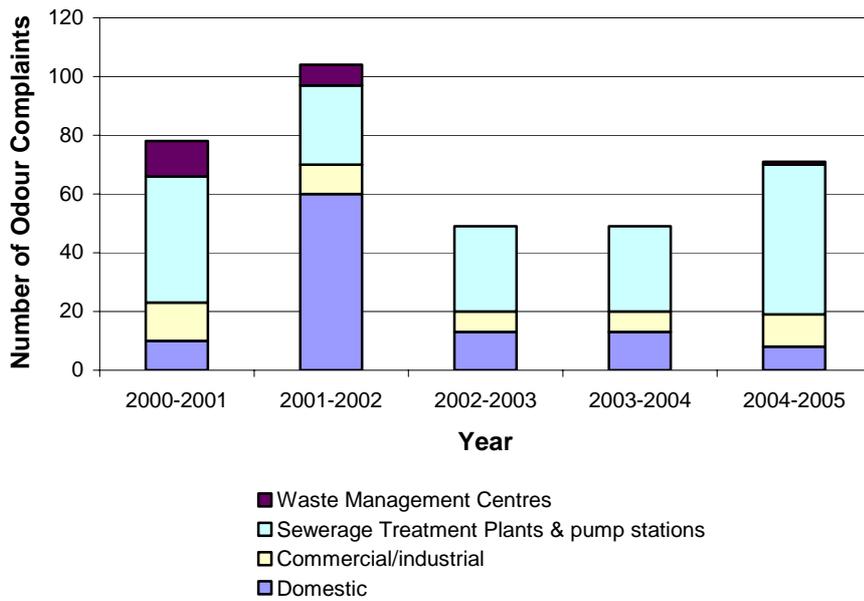
Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. Complaints (total)	**	**	78	104	49	<b>49</b>	71
State	- Domestic	**	**	10	60	13	<b>13</b>	8
State	- Commercial/industrial	**	**	13	10	7	<b>7</b>	11
State	- Sewerage Treatment Plants & pump stations	**	**	43	27	29	<b>29</b>	51
State	- Waste Management Centres	**	**	12	7	0	<b>0</b>	1

\*\* Information not available.

Council's records on odour complaints reveal no clear trends from which conclusions about odour impact can be drawn. However, some trends in complaint types can be explained:

- The reduction in odour complaints associated with waste management centres is attributed to the closing of the Port Macquarie landfill in Kingfisher Rd,
- Odour associated, or perceived to be associated with sewerage infrastructure (pump stations, line breaks etc) is the most consistently common source of complaint to Council.

**Figure 2.6.2.1 – Odour complaints received by Council**



## RESPONSES

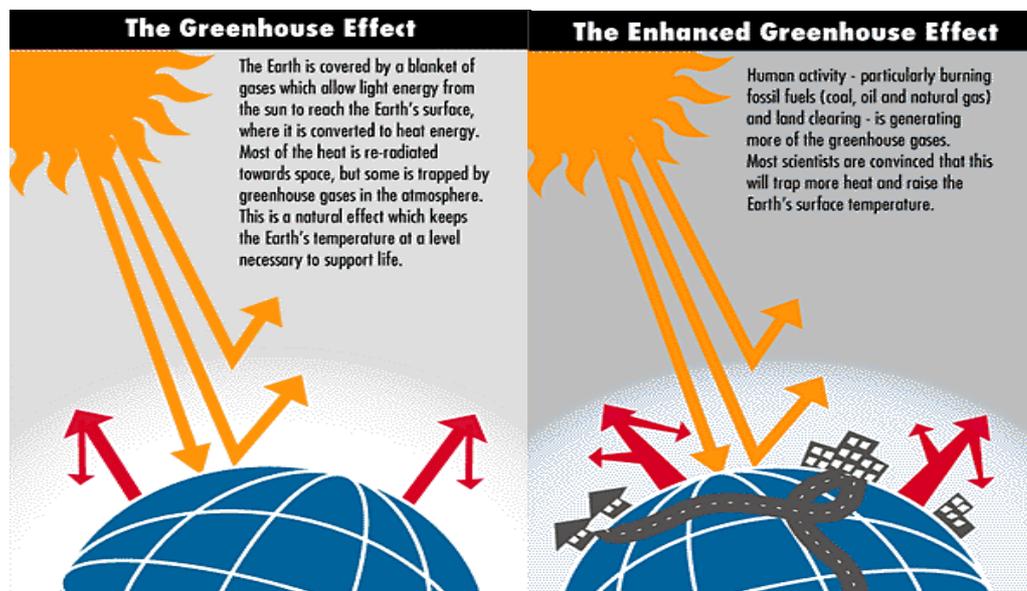
Port Macquarie-Hastings Council has a number of responses to the issue of odour, including:

- Ensuring that new development proposals comply with relevant environmental standards
- The assessment of rezoning proposals to ensure that noise 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.

## CHAPTER 3 – ATMOSPHERE

### 3.1 Climate Change and Energy Consumption

Figure 3.1.1 – The Enhanced Greenhouse Effect



#### TRENDS

Table 3.1.1 – Indicators for Climate Change

Type	Indicator	1996	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
State	National greenhouse gas emissions tonnes/ capita/ year <sup>†</sup>	**	29.2	28.7	28.3	27.8	27.8	27.5
State	Estimated LGA greenhouse gas emissions tonnes/year <sup>††</sup>	585,529	**	**	**	783, 281	**	**
State	Estimated LGA greenhouse gas emissions tonnes CO <sub>2</sub> eq /capita/year <sup>††</sup>	10.4	**	**	**	11.2	**	**
State	LGA Energy consumption (GJ) <sup>††</sup>	4,782,187	**	**	**	6,021,647	**	**
State	LGA Energy use /capita /year (GJ)	85	**	**	**	92	**	**
State	Council operational greenhouse gas emissions tonnes/year	**	**	14,532	**	**	**	21,521

\*\* Information not available

<sup>†</sup>National Greenhouse Gas Inventory 2002

<sup>††</sup>Local estimates based on Census data

## Community Sector Emissions

Data on greenhouse gas emissions is obtained from both the National Greenhouse Inventory compiled by the Federal Government and from local greenhouse inventories carried out by Port Macquarie-Hastings Council through the Cities for Climate Protection Program™.

National Greenhouse Inventory data shown in Table 3.1.1 indicates that on a per capita basis, greenhouse emissions have reduced slightly, but continue to be the highest of all industrialised nations at 27.5 tonnes/person/year. According to Turton (2004), this high per capita trend is due to Australia's reliance on fossil fuels for electricity generation, high transport emissions associated with long travel distances and large metallurgical industry base (particularly aluminium smelting).

Local calculations show that emissions have increased at a rate of about 7.5%pa to 783,281 tonnes of CO<sub>2</sub> since 2001. Although local inventory calculations show that the Port Macquarie-Hastings has a much lower per capita emissions than the national averages, it is the growth in emissions that is the relevant measure. Local emission trends can be partially explained by population growth. Table 3.1.2 below shows the growth rates for individual sector of local emissions.

**Table 3.1.2 – Sector Greenhouse Emissions for the Port Macquarie-Hastings Community**

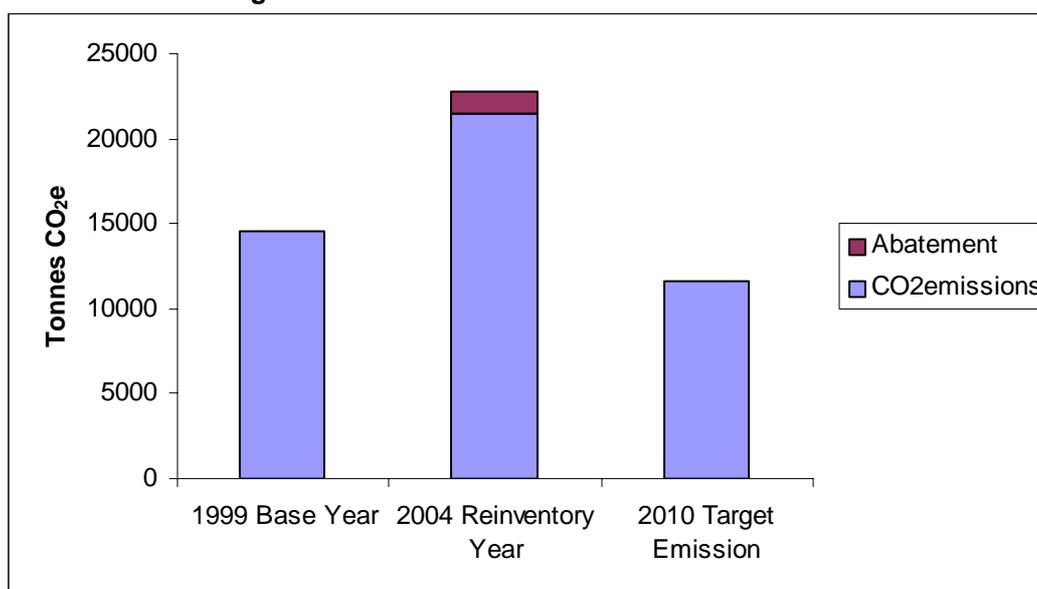
Sector	1996	2001	% Increase
Residential	154,110	211,075	37%
Commercial	80,230	117,635	47%
Industrial	165,413	207,276	25%
Transportation	148,542	201,410	36%
Waste	37,333	45,885	23%

While the residential sector has the highest contribution to emissions in 2001, it is the commercial sector that has shown the highest growth in the local community.

## Council Operational Emissions

Table 3.1.1 shows that greenhouse gas emissions from Port Macquarie-Hastings Council's corporate operations have grown significantly. Emissions have increased from 14,532 tonnes in 1999 to 21,521 tonnes in 2004, an increase in emissions of 48%. Local inventory data shows that water/sewer continues to record the highest emissions in the corporate sector, contributing 52% to total emissions. The next highest contributor is the building sector with 18%, followed by streetlights (14%), vehicle fleet (10%), and waste (6%). The largest increases have come from the building (1,992 tonnes) and water/sewer (1,946 tonnes) sectors. These increases can be attributed to additional facilities being constructed and extra pressure being placed on existing facilities, due to growth since 1999. Emissions from waste were included in the 2004 inventory for the first time and have a bearing on the overall figures.

Figure 3.1.2 shows emissions for both 1999 and 2004, as well as the corporate emissions target for 2010 and the greenhouse abatement achieved during 2004.

**Figure 3.1.2 - Total Corporate Emissions and Abatement for Base, Re-inventory and Target Years**

## RESPONSES

Council's responses to climate change are based upon its participation in the Cities for Climate Protection Program and Greenhouse Action Strategy. Recent responses that have quantified emission reductions include those in Table 3.1.3 below.

**Table 3.1.3 – Quantified Greenhouse Abatement Responses Implemented by Council**

Sector	Measure	CO2E Savings t/year	Energy Savings kWh/year
Corporate	Activation of Energy Star and Power Save features on 255 PCs, 8 faxes, 32 printers, 15 med copiers and 4 large copiers	115	121,599
Corporate	Installation of autotransformers at PM Admin Building (lighting control)	283	31,500
Community	Energy Efficient Housing DCP	5,353	-
Community	Energy efficient light globe promotion	1	666
Community	Organic waste diversion from landfill	3,338	-
Corporate	Purchased 100% Greenpower for small sewerage pump stations	1,210	1,148,005
Corporate	Organic Waste Diversion from Landfills	32,364	
Corporate	Replaced old Hot water Systems at Bonny Hills Caravan Park with Heat Pumps	16	15,799
Total		42,680	1,317,569

Additional responses included:

- Water demand reduction through Waterwise programs
- Tree planting days
- Biodiesel fuel trial

## 3.2 Urban Air Quality

### TRENDS

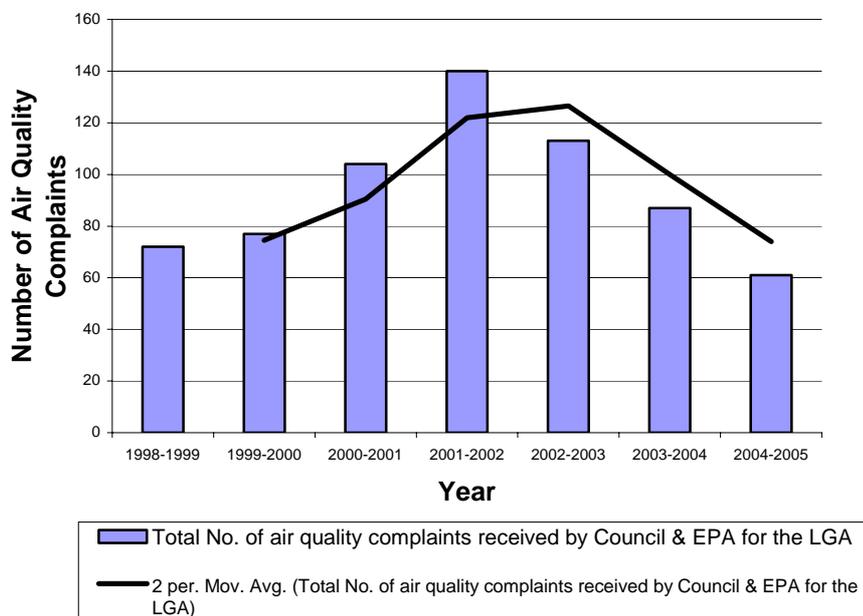
**Table 3.2.1 – Indicators for Urban Air Quality**

Type	INDICATOR	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Pressure	No. of EPA licensed premises	23	23	21	22	22	18	18
State	Total No. of air quality complaints	72	77	104	140	113	87	61
State	No. of air quality complaints - backyard burning	**	**	14	23	12	11	21
State	No. of air quality complaints - wood heaters	**	8	4	8	5	11	5
State	No. of air quality complaints – other	**	**	86	109	96	65	15

\*\* Information not available

The figures relating to the number of air quality related complaints received are shown in the Table 3.2.1 and Figure 3.2.1. There has been a decrease in air pollution complaints since 2001/2002 and over all, trends reveals no overall increase in complaints over the last seven years. The recent decrease is primarily due to prohibitions on backyard burning and improved practises associated with subdivision burn-offs and dust control near residential areas (stemming from tighter regulation).

**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. The trend of increasing motor vehicle registration, as shown in Figure 2.3.1, suggests transport related air quality impacts in the LGA would be increasing.

## 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.
- Closing local landfills
- Constructing cycleways

## CHAPTER 4 – LAND

### 4.1 Land Use Changes

#### TRENDS

**Table 4.1.1 - Indicators for Land Use Changes**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Land zoned for urban development (ha)	<b>+25</b>	+2	-22	0	+10	<b>-12</b>	+20
State	No. rateable residential properties	<b>23,304</b>	23,843	24,572	25,012	26,013	<b>26,384</b>	27,271
State	No. rateable business properties	<b>1,485</b>	1,528	1,623	1,620	1,746	<b>1,745</b>	1,796
State	No. rateable farmland properties	<b>1,412</b>	1,415	1,414	1,411	1,494	<b>1,406</b>	1,417
Pressure	No. of development applications (total)	<b>1,384</b>	1,118	812	859	984	<b>916</b>	886
Pressure	No. of residential development applications approved	<b>893</b>	586	383	358	326	<b>358</b>	326
Pressure	No. of commercial/ industrial development applications approved	<b>103</b>	142	111	124	171	<b>153</b>	198
Pressure	No. of residential subdivision applications approved	<b>32</b>	49	33	34	44	<b>72</b>	76

#### Land Use

Table 4.1.1 and Figure 4.1.1 show that the number of rateable residential and business properties are steadily growing, while the rateable farmland properties have remained unchanged over the last seven years. This data demonstrates the increase in urban landuse, but is likely to understate the reduction in rural land resulting from urban growth. Accurate land use area information is needed to better analyse the potential impacts of landuse change.

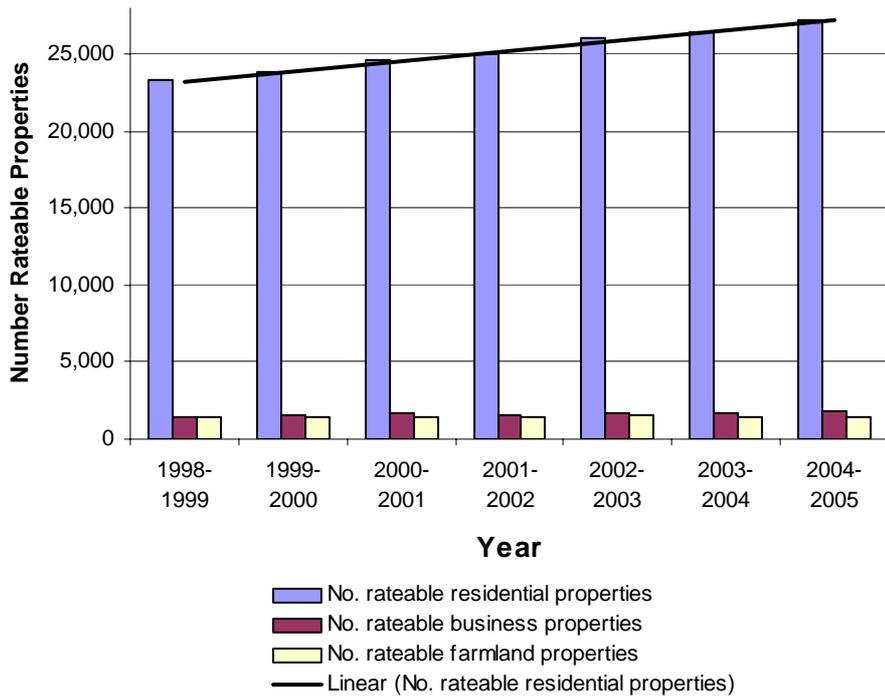
#### Development

Table 4.1.1 provides a breakdown of the development applications received and processed by Council. It should be noted that changes in the development approval process has affected the 1998-1999 and 1999-2000 figures.

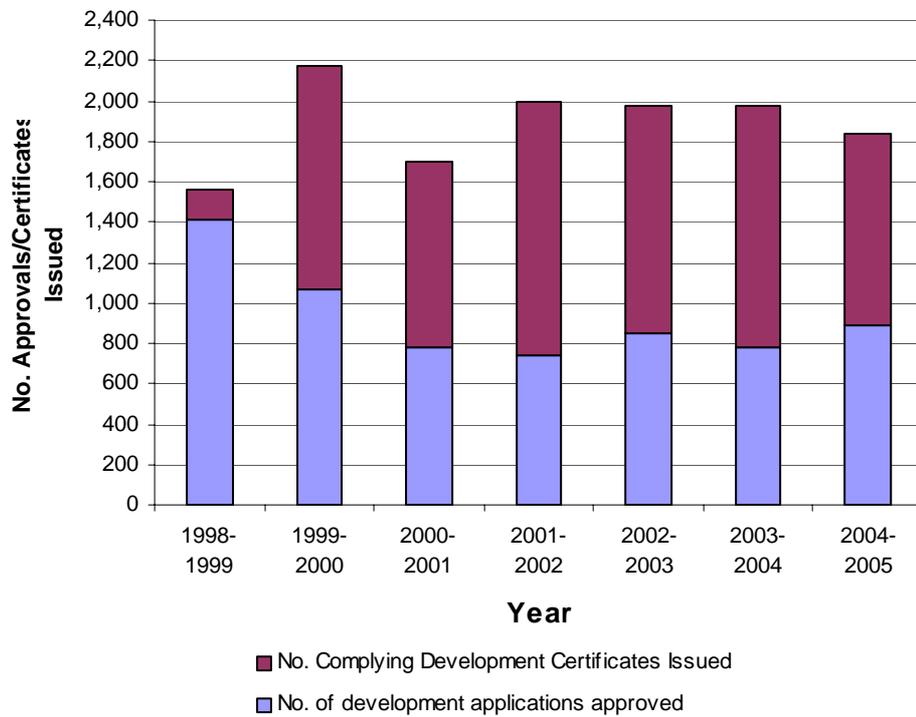
The data shows the continuing trend of high development in the Port Macquarie-Hastings, despite a slight fall in approvals during 2004-2005. The higher number of residential subdivisions approved during 2004-2005 suggests a likely increase in residential building approvals over the next few years. Figures 4.1.2 and 4.1.3 provide a graphical break down of the volume and type of development approvals issued.

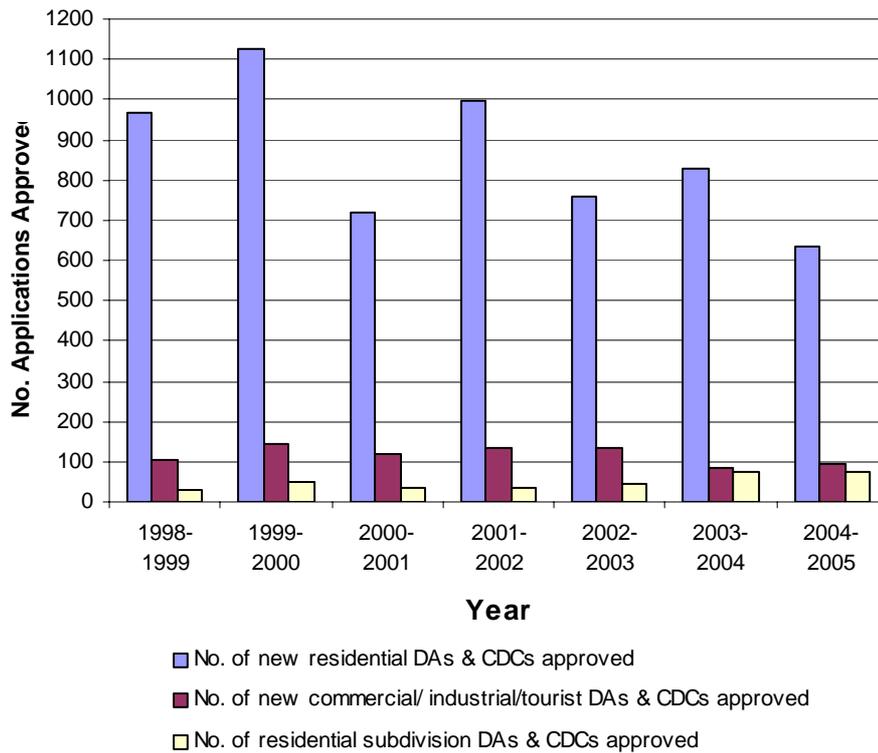
The demographic and urban landuse information that is available indicates that the growth in urban landuse continues to be the most significant in the coastal 'strip'.

**Figure 4.1.1 – Property Use Trends**



**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

These strategies are complimented by infrastructure strategies such as the Hastings Effluent Management Strategy and the Hastings Drought Management Plan and Hastings Waste Management Strategy that over arch numerous specific projects aimed at serving sustainable urban growth.

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	1998	1999	2000	2001	2002	2003	2004
		-	-	-	-	-	-	-
		1999	2000	2001	2002	2003	2004	2005
State	S&E control - building sites - complaints	New Indicator					9	15
Response	S&E control - building sites - warnings issued	New Indicator					30	10
Response	S&E control - building sites - fines issued	New Indicator					11	6
Response	Streamcare / river rehabilitation projects	New Indicator	33	52	73	35		

S&E – Sediment and erosion.

The surrogate indicators in Table 4.2.1 are used to infer soil erosion impacts. 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 Department of Natural Resources (DNR) have identified eight (8) sub-catchments severally 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 affected these sub-catchments are soil and river erosion.

Within these 8 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 and Gogleys Lagoon. To date a total of 213 formal small bank stabilisation projects have been implemented to address bank erosion problems. Other works have also been carried out by private landholders in many locations.

### RESPONSES

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

- Enforcement of erosion and sediment control practises on development sites.
- Stream bank erosion projects in partnership with the Department of Natural Resources, Landcare and the Northern Rivers Catchment Management Authority.
- In partnership with Landcare and the Northern Rivers Catchment Management Authority, set up a project to remediate erosion on rural land within the LGA (to commence 2005-2006)
- Completed a draft best management guideline for gravel road design and maintenance. These guidelines outline appropriate sediment control and erosion prevention works required to minimise offsite water pollution in differing soil types, rainfall zones and road gradients. It is envisaged that these guidelines will be reviewed for implementation in the 2005-06 financial year.

## 4.3 Acid Sulfate Soils

### TRENDS

**Table 4.3.1 - Indicators for Acid Sulfate Soils**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Response	Total area of wetland /wet pastures re-established (ha)	0	0	0	8	504	762	833
Response	Percentage of acid sulfate soils drainage networks remediated (out of a total of 57)	0%	0%	0%	6%	42%	65%	84%

Accurate data on trends associated with acid sulfate soils impacts across the LGA are difficult to collect on a consistent basis. Indicator data in Table 4.3.1 focuses on remedial action and attempts to provide an analysis of impact reductions.

Impact reductions resulting from the implementation of remediation projects include:

- Reductions in the duration and frequency of acid discharges from remediated drainage networks
- Remediation of acid scalded land
- Recreation and maintenance of backswamp environments.

### RESPONSES

Currently 48 of the 57 known acid discharging drains have been remediated at a cost of \$1.25M. All five 'hotspots' in the Hastings and Camden Haven catchments have been remediated or are in partial remediation. A total of 833 hectares of wetlands has been rehabilitated using a wet pasture management to promote vegetation regrowth and contain acidic groundwater. 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 and proposed remediation work. Figure 4.3.1 – Acid Sulfate Soil Remediation Works

**Figure 4.3.1 - Acid Sulfate Soil Remediation Works**

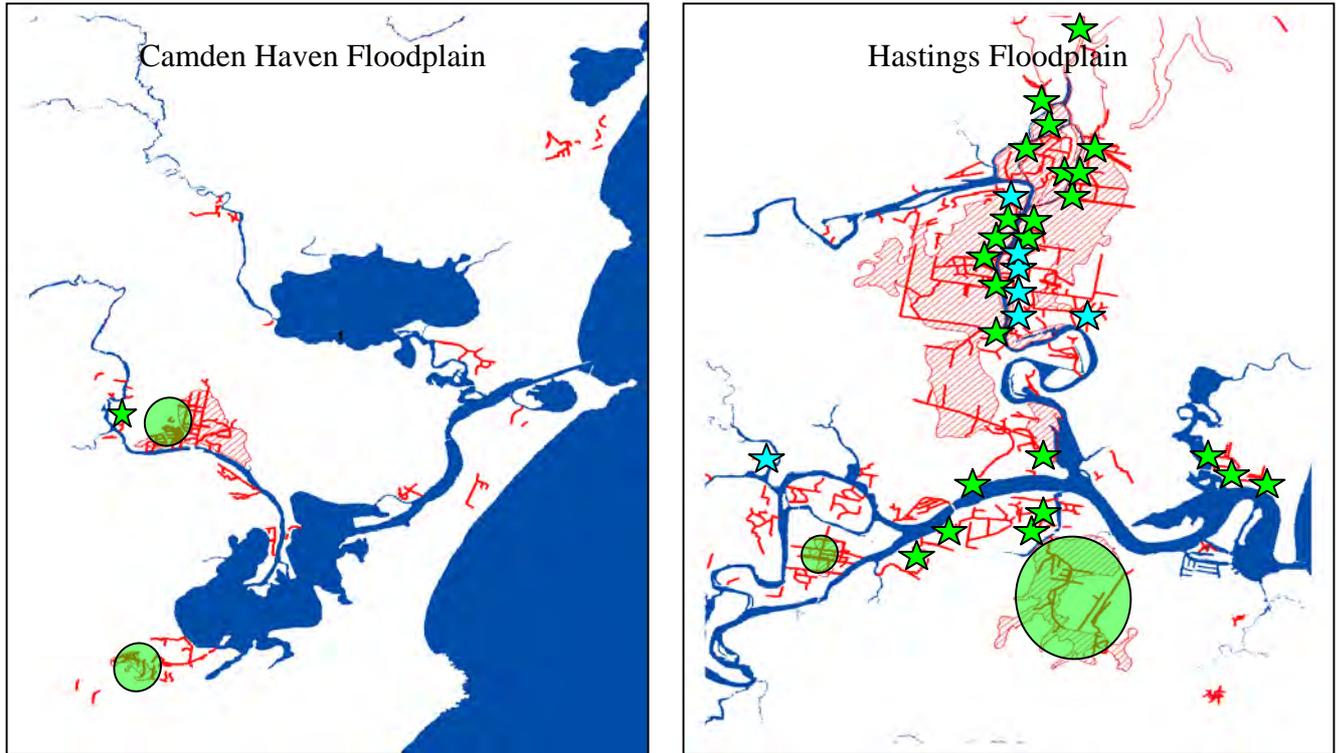


Remediated wetland on the Maria River



Weir in artificial drain restoring the hydrology of a 300-heactre wetland, and reducing acid discharge into the Maria River

**Figure 4.3.2 – Completed and Proposed Acid Sulfate Soil Remediation Sites**



-  ASS Hot Spot
-  Artificial drainage
-  Drainage headwork remediation completed 2001-2004.
-  Wet Pasture / wetland remediation site completed 2001-2004.
-  Proposed remedial works 2005-06.

## 4.4 Land Contamination

### TRENDS

**Table 4.4.1 - Indicators for Land Contamination**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of potentially contaminated sites	**	165	187	186	153	<b>157</b>	156
State	No. of DEC confirmed contaminated sites	**	2	2	2	0	<b>0</b>	0
State	No. of sites under investigation by DEC	**	14	14	15	0	<b>0</b>	0

\*\* Information not available

Table 4.4.1 above shows contaminated land statistics from Council's geographical information systems. There has been a decreasing trend in the number of contaminated sites in the LGA over the past six years. This decrease is related to the remediation of contaminated sites, generally associated with landuse changes and redevelopment.

There are currently no sites 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 site with the LGA

## CHAPTER 5 – WATER

### 5.1 Surface Water Extraction

#### TRENDS

**Table 5.1.1 – Indicators for Surface Water Extraction**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Total water demand from local rivers for potable supply (ML)	<b>5,153</b>	5,364	6,572.9	6,693	6,180.8	<b>6503.2</b>	7,322
State	Annual water demand from Hastings River by Council for potable supply (ML)	<b>5,079</b>	5,284	6,472	6,579.1	6,084.4	<b>6420.4</b>	7,239
State	Annual water demand from Thone River by Council for potable supply (ML)	<b>31</b>	33	43.2	50.2	42.5	<b>31.1</b>	27
State	Annual water demand from Wilson River by Council for potable supply (ML)	<b>43</b>	47	57.7	63.7	53.9	<b>51.5</b>	56
State	Number of surface water licences	<b>298</b>	298	258	**	267	<b>345</b>	**
State	Allocation (ML/yr) for surface water licences	New Indicator					<b>11,792*</b>	**

\* Excludes Town Water Allocation

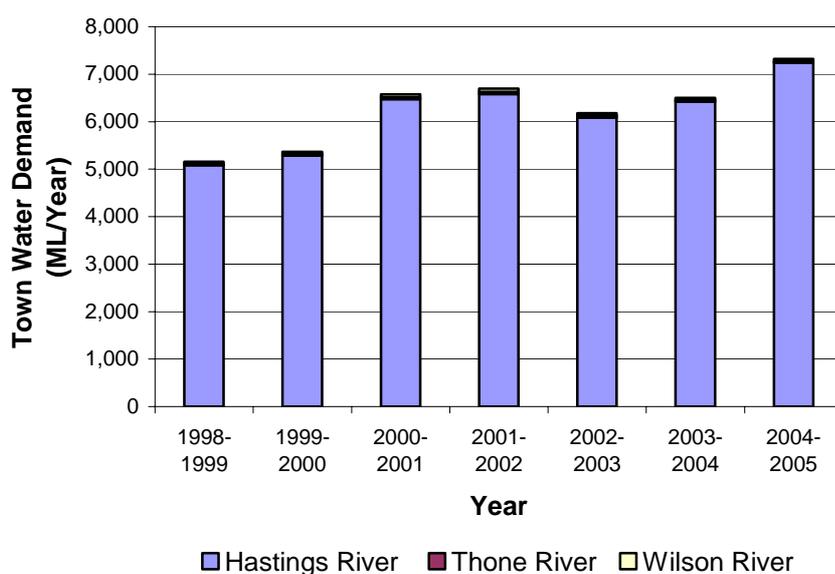
\*\* Information not available

#### Port Macquarie-Hastings Council Water Supply System

Port Macquarie-Hastings Council provides a full range of urban water services, including storage dams, water treatment plants and delivery systems. Currently the regions water supply is stored in two 'off-creek' storage dams located at Port Macquarie (2,500 million litres) and Cowarra (10,000 million litres). These 'off-creek' storage dams are filled with water pumped from the Hastings River at Koree Island, just west of Wauchope.

Figure 5.1.2 shows that the total water demand trend fluctuates depending on rainfall conditions, but is dominated by population increase overall.

Council does not pump water if river flows fall below minimum environmental levels, which are required to protect the riverine ecosystem.

**Figure 5.1.2 – 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:

- Completion of Cowarra Dam as part of the Drought Management Plan. This facility will allow 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 Rivers 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.

## 5.2 Groundwater Extraction

### TRENDS

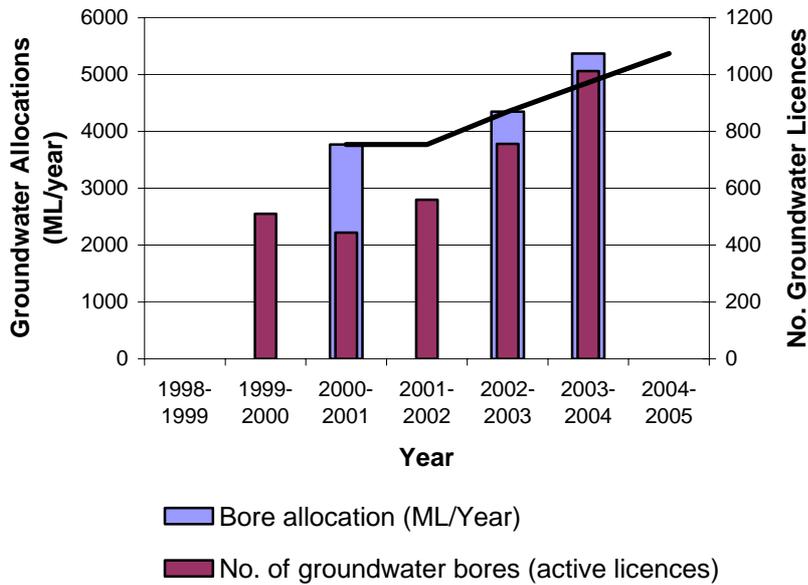
**Table 5.2.1 – Indicators for Groundwater Extraction**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of groundwater bores (active licences)	**	510	444	560	756	<b>1012</b>	**
State	No. of bores (active irrigation licences)	**	32	**	**	**	**	**
State	Bore allocation (ML/Year)	**	**	3,770	**	4,350	<b>5,368</b>	**

\*\* Information not available.

Data in Table 5.2.1 shows that the number of groundwater bores and the corresponding annual allocation for groundwater abstraction is increasing annually. This trend is also shown graphically in Figure 5.2.1 below.

**Figure 5.2.1 – Groundwater Extraction Trends**



## RESPONSES

Responses that relate to groundwater abstraction are implemented primarily by the NSW Department of Natural Resources 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

### TRENDS

**Table 5.3.1 – Indicators for Water Quality & Riverine Ecosystem Health**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	% of samples exceeding ANZECC water quality guidelines for Nutrients <sup>*</sup> :							
	Estuary	<b>68.4%</b>	71.1%	14.6%	54.1%	51.9%	<b>24.3%</b>	**
	STP affected estuarine Upland Freshwater	<b>76.3%</b> **	73.6% 47.7%	81.3% 44.8%	82.6% 20.8%	90.7% 25.6%	<b>67.5%</b> <b>41.4%</b>	82.5% **
State	% of samples exceeding ANZECC water quality guidelines for Physiochemical parameters <sup>**</sup> :							
	Estuary	**	**	**	**	15.9%	<b>15.6%</b>	**
	STP affected estuarine Upland Freshwater	**	** 35.7%	36.4%	39.3%	15.5%	<b>27.3%</b> <b>11.4%</b>	21.1 **
State	No. of water pollution incidents	New Indicator					<b>40</b>	36
Response	No. of stormwater quality improvement devices	New Indicator					<b>104</b>	**
Response	Total number of River Rehabilitation grants completed (Streamcare and other)	**	**	33	52		<b>35</b>	

**Note:** <sup>\*</sup>% Exceedence is calculated by dividing the total number of sampling events exceeding ANZECC guidelines by the total number of sampling events. Nutrients include Total Nitrogen, Total Phosphorous, Nitrate, Nitrite, and Orthophosphorous.

<sup>\*\*</sup>% Exceedence is calculated by dividing the total number of sampling events exceeding ANZECC guidelines by the total number of sampling events. Physio-chemical parameters include pH and Dissolved Oxygen for estuaries and pH and Dissolved Oxygen and Turbidity for freshwater upland waterways.

\*\* Information not available

Data in Table 5.3.1 and the following figures shows the proportion of water samples collected and analysed by Council that failed to meet ANZECC water quality criteria. The data does not reveal any particular trends at this stage. While the data does indicate that water quality fails to meet specific water quality criteria, it should be recognised that the ANZECC criteria are 'generic' and do not take into account local conditions (geomorphologic or otherwise). In this respect Council will be developing ambient water quality criteria using local data in accordance with ANZECC guidelines. Generally, water quality in the LGA is good.

Figure 5.3.1 – Comparison of Water Quality with ANZECC criteria for Nutrients

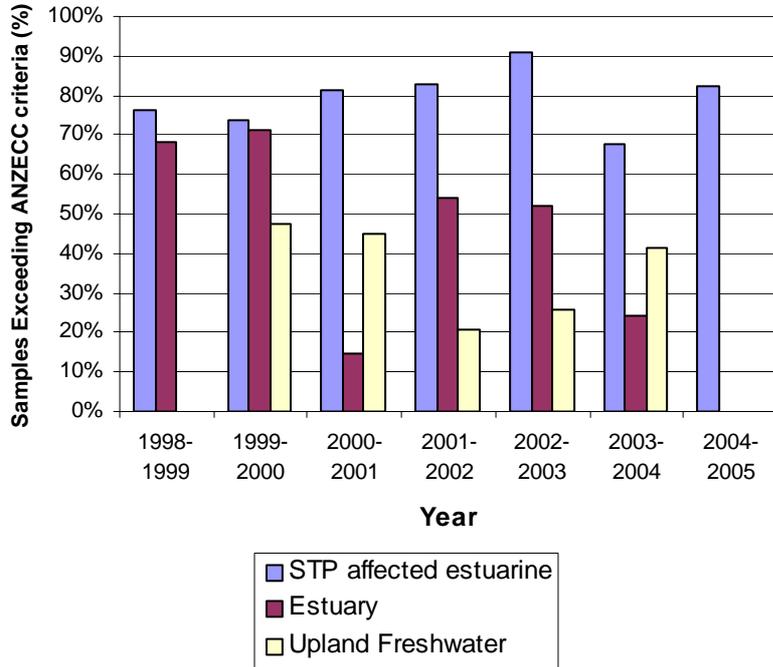
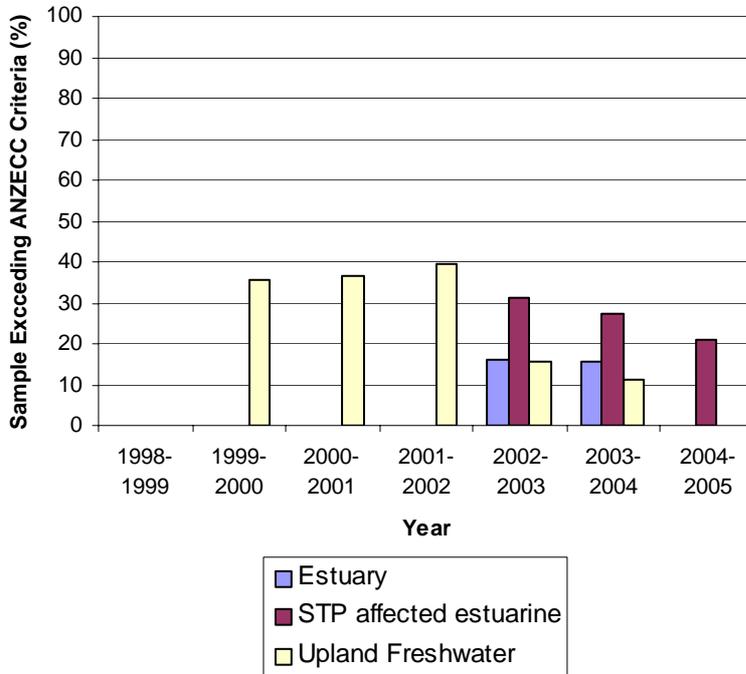


Figure 5.3.2 – Comparison of Water Quality with ANZECC criteria for Physicochemical Parameters



## RESPONSES

A number of responses to water quality and riverine ecosystem health are implemented by Council, NSW Government Agencies, Landcare and other community groups. Relevant responses for 2004-2005 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 associated with routine monitoring of environmental conditions and for water and sewerage operations.
- Implementation of Streamcare projects by Landcare.
- Implementation of projects under council's Estuary Management Plan.
- Installation of stormwater quality improvement devices under Council's Urban Stormwater Management Plan
- Continued development of an integrated water quality database to ensure efficient use and 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.

## 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	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Response	Area of LGA conserved in NPWS estate (%)	**	**	22.1	22.1	24.3	<b>24.7</b>	24.7
State	No. of threatened fauna/flora species in the LGA (Threatened Species Conservation Act 1998)	**	**	**	**	117	<b>118</b>	118
State	Koala mortality and morbidity (admissions to Koala Hospital)	<b>139</b>	203	208	215	195	<b>214</b>	179
Response	No. biodiversity conservation/restoration projects implemented*	**	**	**	51	42	<b>15</b>	20

\* 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.

A slight decrease in Koala morbidity and mortality is suggested by a reduction in admissions to the Koala Hospital. However the figure reveals that impacts on Koalas (as a sentinel species for urban impacts on native species) continue to be significant.

The number of biodiversity conservation projects implemented in the LGA has decreased when compared to figure for 2001-2002 and 2002-2003. This is due to the high number of projects implemented as part of the Streamcare Voluntary Grants Scheme that operated between 2001 and 2003.

#### RESPONSES

Threats to terrestrial ecosystem and species diversity are managed locally by a number of organisations including Council, Landcare, Department of Environment and Conservation, 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 education programs
- Implementation of planning laws and local planning instruments to protect terrestrial ecosystems and species diversity from inappropriate development

## 6.2 Native Vegetation Clearing

### TRENDS

**Table 6.2.1 – Indicators for Native Vegetation Clearing**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Extent of woody vegetation cover (% of land area in LGA)	72	72	72	**	**	71	71

\*\* Information not available

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% decrease in woody vegetation cover in the LGA over the last seven years. This equates to an approximate loss of 37km<sup>2</sup> of woody vegetation from the LGA since 1998.

### RESPONSES

A range of organisations including Port Macquarie-Hastings Council, Department of Natural Resources, Department of Environment & Conservation, 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 Dept Natural Resources.
- 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.
- Council continued its support of local Landcare projects through its Environment Levy allocations.
- Revegetation projects by Landcare and other community organisations
- Property vegetation planning for rural landholders by NRCMA.

## 6.3 Introduced Terrestrial Species

### TRENDS

**Table 6.3.1 – Indicators for Introduced Terrestrial Species**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. of introduced animal species	17	17	17	17	17	17	18
State	No. of introduced plant species	138	138	140	140	142	142	142
Response	No. of declared noxious weeds	**	20	20	22	22	22	22
State	No. of complaints regarding noxious weeds	**	**	**	**	**	27	33

\*\* Information not available

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.

The number of introduced terrestrial animal species has increase by one as a result of the addition of the Indian Myna to Councils indicator list, despite this pest being present in the area for a number of years.

The Rural Lands Protection Board advise of an increasing trend in wild dog and rabbit numbers during 2005-2006.

Noxious weed and introduced plant species numbers have been updated to correct inaccuracies in previous reports. Anecdotal evidence suggests increases in Alligator Weed and Camphor Laurel within the LGA.

### RESPONSES

A number of organisations a responsible for implementing responses reduce the impact of introduced species in local biodiversity including Port Macquarie-Hastings Council, Department of Natural Resources, Department of Primary Industries, Department of Environment and Conservation, Landcare and other community based groups. The following are responses implemented during 2004-2005.

- Bitou Bush control projects in partnership between Council, Landcare and the Department of Environment & Conservation including aerial spraying. Biological control agents are still active in certain areas of the coastline.
- Giant Parramatta Grass infestations along roadsides are being inspected and controlled by Council throughout the local government area with a reduction in total area and density of infestations.
- Salvinia infestations on private lands have been controlled on a number of properties following inspection and advice from Council officers. A combination of mechanical and chemical control has proved effective in most cases. Establishment of viable colonies of cytobageous weevils is proving difficult due to the winter temperatures and the number of frosts.
- Riparian weed control works focussing on Madeira Vine and Catsclaw Creeper have continued during 2004/2005. Trial work has been conducted on one of Council's reserves in conjunction with Department of Primary Industries to evaluate the effectiveness of various herbicides and application techniques.

- Continuation of Council's Noxious Weeds Program. Council officers carried out approximately 400 on-ground inspections of rural properties. Aerial inspections were conducted both along the coastal fringe and along the Hastings, Ellenborough and Thone Rivers, covering approximately 300 properties.
- Council has continued educational and awareness activities including; inspection of aquarium/pet shops with reference to the sale of potential aquatic weeds; informing landholders about the roadside spread of Coolatai grass; production of 4,000 weed control calendars; awareness advertising in Town & Country newspaper supplement.
- 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 (eg, Bitou Bush, Grounsel Bush etc).
- Landcare have continued to address weed infestations through a range of projects.
- Council in partnership with the Hastings Valley Hunting Club have implemented a feral animal control program on Council land at Thrumster targeting feral deer, feral cats, foxes and wild dogs. A program has also been developed for the Port Macquarie Waste Management Facility site.
- Control of feral cats at Council Waste Management Facilities.
- Council and Landcare have ordered Indian Myna traps with the intention of implementing a volunteer trapping program during 2005-2006.

## 6.4 Fire

### TRENDS

**Table 6.4.1 – Indicators for Fire**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Pressure	Area affected by major bushfire (hectares)	**	**	Nil	Nil	7,500	Nil	Nil
Pressure	No. Permits issued by RFS for hazard reduction burning	**	**	**	**	**	1007	649

\*\* Information not available.

Data listed in Table 6.4.1 attempts to provide insight into trends associated with fire related impacts on biodiversity in the LGA. There have been no significant areas affected by major bushfire since 2002-2003.

A new indicator has been introduced to assist in understanding the potential local impact of fire on biodiversity. The Rural Fire Service has provided data on the number of permits issued for burning in the past two years. Data on permits for burning that have the potential to impact on biodiversity have been sorted and show that 1007 permits were issued in 2003-2004 as compared with 649 in 2004-2005. However, it is too early to determine trends based upon this limited data set.

### 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 requires 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	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Number of aquatic endangered and vulnerable species	New Indicator					5	5

Threatened aquatic species include the Black Cod, Great White Shark, Grey Nurse Shark, River Snail and the Green Sawfish.

### RESPONSES

Responses to manage and protect aquatic ecosystems and aquatic species diversity are principally implemented by NSW 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 .

## 6.6 Introduced Aquatic Species

### TRENDS

**Table 6.6.1 – Indicators for Introduced Aquatic Species**

Type	Indicator	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	No. Introduced Aquatic Species*	New Indicator				3	3	3

\*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*). Information on the true extent of introduced aquatic species (eg, ballast water introductions) is not currently available.

### RESPONSES

Responses to manage and prevent further exotic introductions are principally implemented by NSW Fisheries. Local responses implemented by Council in relation to aquatic weeds are addressed through terrestrial weed control initiatives as outlined in Section 6.3.

## 6.7 Aquatic Harvesting

### TRENDS

**Table 6.7.1 – Indicators for Aquatic Harvesting**

Type	INDICATOR	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
State	Total Sydney Rock Oyster Production – Hastings River (dozens)	160,478	233,606	230,054	341,601	378,125	363,272	**
State	Total Sydney Rock Oyster Production – Camden Haven River (dozens)	145,075	155,430	135,620	164,538	183,021	196,227	**

\*\* Information not available at time of publication

The Sydney Rock Oyster indicators in Table 6.7.1 are a useful indicator 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.

NSW Fisheries data on oyster production in the Hastings and Camden Haven estuaries reveals that there has been an overall increase in production between 1998/99 and 2003/04. While the 2004/05 data has not been officially released, it can be confirmed that production rates in the Hastings remained relatively static.

### RESPONSES

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

## GLOSSARY

ABS means Australian Bureau of Statistics

ANZECC means Australian and New Zealand Environment Conservation Council

ASS means Acid Sulfate Soils

AWTS means aerated wastewater treatment system

DCP means 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 means NSW Department of Environment and Conservation (formerly EPA and NPWS)

DNR means Department of Natural Resources (formerly part of DIPNR)

EPA means NSW Environment Protection Authority

GIS means geographical information system

HUGS means Hastings Urban Growth Strategy 2001

KL means kilolitres (1000 litres)

LEP means Local Environmental Plan

LGA means local government area

ML means megalitres (million litres)

NPWS means NSW National Parks & Wildlife Service

NRCMA means Northern Rivers Catchment Management Authority

OSM means on-site sewage management system

RTA means NSW Roads & Traffic Authority

SoE means State of the Environment

SQID means Stormwater Quality Improvement Device

STP means Sewerage Treatment Plant

TPO means Tree Preservation Order

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