State of the Environment Report Contributors

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What is a State of the Environment Report?
The State of the Environment (SoE) Report aims to identify specific pressures being placed upon the ecological sustainability of the shire, report on the responses being undertaken to address these pressures and identify where gaps exist in these responses. Armed with this knowledge, Council can allocate its environmental management resources more effectively and devise a far more strategic plan of action to progress towards the achievement of Ecologically Sustainable Development (ESD).

SoE Reporting Format
The SoE Report is a statutory reporting requirement of the Local Government Act, 1993. It follows a specific reporting format of Condition – Pressure – Response (CPR). Through the CPR process Council describes the current condition of the environment on which we all depend, identifies pressures that are threatening those conditions, charts current responses to help address those pressures and most importantly, identifies where additional responses are required.

SoE Reporting Timeline and Relationship With Council’s Management Plan

Reporting Period
This SoE report details council’s environmental management responses between 1 July 2005 and 30 June 2006.

Sustainability Indicators
The SoE Report uses a range of indicators to measure how pressures on the environment are changing over time. These indicators help council to:

- Identify environmental management priorities.
- Monitor and evaluate the effectiveness of current environmental management initiatives.
Ecologically Sustainable Development

It is important to recognise that it is the environment that ultimately supports society and the economy (Figure 1). Without a healthy environment, food and water supply is jeopardised, our highly regarded quality of life declines, tourism and associated business suffer and the shire no longer becomes a place where people want to live, work and visit.

![Ecological Sustainability model developed by Professor Ian Lowe](image)

One of the major challenges presented by ecologically sustainable development is the balancing of conflicting land use issues. For example, in the provision of housing, Council must also have regard to the Shire's environmental and community needs. Consideration needs to be given to issues such as appropriate urban form and design, conserving environmentally sensitive areas, accommodating population growth and catering for community desires. (Hornsby Shire Council 2003)

**Ecologically sustainable development does not prevent development, it just ensures that it occurs with the future of the whole community in mind. Situations that require decisions between benefits to the whole community and the profit-making rights or personal desires of individuals, have the capacity to influence sustainability more than any other area.** (DLG, 1999).

To address community concerns a balance has to be struck between economic and urban development on the one hand, and retaining the Shire's natural beauty and diversity on the other, so that people can enjoy a wide range of lifestyles. (TSC 2004 b)

Tweed Shire Council is the lead agency in ensuring that growth does not threaten long-term social and ecological sustainability for the sake of short-term economic gain.

Tweed Shire Council not only has a legal responsibility to integrate the principles of ESD into its operations, but it also has a social responsibility to protect community values. Extensive community consultation as part of the strategic planning process highlights that these values are rooted in the protection of the Tweed’s natural beauty, scenic landscape and environmental quality.
THE BUILT ENVIRONMENT

CONDITION

Long Term Goals

To ensure an efficient and effective local approval process that safeguards the natural environment, quality of life and the ability of future generations to grow and prosper in a healthy environment.

To strike a balance between economic and urban development on the one hand, and retaining the Shire’s natural beauty and ecological diversity on the other. (TSC 2006 a)


Shire Description

The Tweed Shire is located in the north-eastern corner of New South Wales. It has an area of approximately 1303 square kilometres, and is encircled by three mountain ranges, namely the McPherson Range in the north, the Tweed Range in the west, and the Nightcap range in the south. The shire borders the Pacific Ocean to the east. The two dominating features of the valley are Mount Warning / Wollumbin (1156 metres) and the Tweed River which flows into the sea at Tweed Heads. Wollumbin is the remnant core of the Tweed Shield Volcano. The steep rim of the caldera surrounds Wollumbin at a radius of approximately 15 kilometres. The eastern side of the volcano’s rim has been broken by the Tweed River and its tributaries have carved out the Caldera (TSC 1996)

For the foreseeable future the Tweed will remain predominantly rural. About two-thirds of the Shire is zoned for rural uses, including plantation forests and rural residential areas (refer to the Land Use Zonings Table for more detail). Most farmland is used for grazing of beef and dairy cattle. Sugar cane occupies about 7% of the Shire, mostly floodplains. Other agricultural activity includes banana growing, horticulture and market gardens, but the areas involved are quite small. Rural areas also include important tourism and recreation facilities (TSC 2004 b)

PRESSURE

Key Threatening Processes

Environmental pressures associated with the growth of the built environment include (but are not limited too):

An increase in the shires urban footprint and an associated reduction in the size, function and connectivity of natural ecosystems.

Increased loadings on Wastewater Treatment Plants and effluent discharges to waterways.
Increased volumes and pollutant loadings of stormwater discharges to waterways.

Increased water consumption, which in turn leads to:

- An increase in the pressures being placed upon the ecosystems that rely on environmental flows from water storage sites.
- Increased demand for additional / upgraded water supply infrastructure.
- Increased pressures on the ability of existing surface water sources to adequately service future populations.

Increased solid waste generation.

Increased greenhouse gas emissions associated with rising energy consumption and vehicle traffic.

### Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population of the Tweed Shire</td>
<td>55,869</td>
<td>66,864</td>
<td>74,380</td>
<td>81,700</td>
<td>83,400</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Indicator: Development Applications (DA's)</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of DA's processed</td>
<td>1632</td>
<td>2178</td>
<td>1906</td>
<td>1530</td>
<td>1422</td>
</tr>
<tr>
<td>State Average</td>
<td>727</td>
<td>742</td>
<td>765</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: DLG 2004 & Tweed Shire Council Development Assessment Unit

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Residential Dwellings</td>
<td>23,077</td>
<td>28,835</td>
<td>32,974</td>
<td>N/A</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Indicator: Residential Lots</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rural residential lots approved</td>
<td>22</td>
<td>78</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Area (Ha) of rural lots approved</td>
<td>106.5</td>
<td>565.5</td>
<td>755.8</td>
<td>315.5</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Development Assessment Unit

<table>
<thead>
<tr>
<th>Indicator: Residential Lots</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of urban residential lots approved</td>
<td>N/A</td>
<td>222</td>
</tr>
<tr>
<td>Area (Ha) of urban lots approved</td>
<td>N/A</td>
<td>338.5</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Development Assessment Unit

### Additional Indicators

- **Water Consumption**: refer to the *Water Supply* section of this report.
- **Solid Waste Generation**: refer to the *Waste Management* section of this report.
- **Wastewater Generation**: refer to the *Waste Management* section of this report.
- **Greenhouse Gas Generation**: refer to the *Atmosphere* section of this report.
- **Vehicle Numbers**: refer to the *Transport* section of this report.
RESPONSE

Land Use Planning

Land use planning involves the formulation of strategies to protect and enhance the environmental qualities of the Shire, facilitate the orderly and economic development of land and promote the well being of the area's population. The strategies take the form of the Tweed Local Environmental Plan (LEP) and various Development Control Plans (DCP's). The LEP provides the land-use planning framework while the DCP's provide detailed development guidelines to ensure appropriate development design. Councils LEP and DCP's can be accessed via the 'Planning & Building' section of Councils website: www.tweed.nsw.gov.au

Zoning control is a major component of land use planning that seeks to ensure the appropriate composition and location of rural, residential, commercial, industrial and open space uses within the Shire. Zoning also delineates special uses, environmental protection areas, National Parks and nature reserves.

Land-Use Zonings

Land-use zoning forms the top level of councils land management system. Land use zonings are set out in the Tweed Local Environment Plan (LEP), 2000. The LEP identifies the land use zones for the entire shire, details the objectives of each zone and describes a list of prohibited and permissible uses corresponding to each zone. To view the Tweed LEP visit www.tweed.nsw.gov.au

Table1: Land Use Zonings for the Tweed Shire - June 2005

<table>
<thead>
<tr>
<th>Local Environment Plan (LEP) Zone</th>
<th>Area (Ha)</th>
<th>% of the shire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a) Rural</td>
<td>69,699.63</td>
<td>55.20%</td>
</tr>
<tr>
<td>1(b1) Agricultural Protection</td>
<td>2,561.26</td>
<td>2.03%</td>
</tr>
<tr>
<td>1(b2) Agricultural Protection</td>
<td>10,692.63</td>
<td>8.47%</td>
</tr>
<tr>
<td>1(c) Rural Living</td>
<td>1,548.42</td>
<td>1.23%</td>
</tr>
<tr>
<td>2(a) Low Density Residential</td>
<td>1,010.14</td>
<td>0.80%</td>
</tr>
<tr>
<td>2(b) Medium Density Residential</td>
<td>181.349</td>
<td>0.14%</td>
</tr>
<tr>
<td>2(c) Urban Expansion</td>
<td>1,772.07</td>
<td>1.40%</td>
</tr>
<tr>
<td>2(d) Village</td>
<td>439.024</td>
<td>0.35%</td>
</tr>
<tr>
<td>2(e) Residential Tourist</td>
<td>314.145</td>
<td>0.25%</td>
</tr>
<tr>
<td>2(f) Tourism</td>
<td>130.261</td>
<td>0.10%</td>
</tr>
<tr>
<td>3(a) Sub-Regional Business</td>
<td>11.0009</td>
<td>0.01%</td>
</tr>
<tr>
<td>3(b) General Business</td>
<td>47.4907</td>
<td>0.04%</td>
</tr>
<tr>
<td>3(c) Commerce &amp; Trade</td>
<td>73.3504</td>
<td>0.06%</td>
</tr>
<tr>
<td>3(d) Waterfront Enterprises</td>
<td>46.4955</td>
<td>0.04%</td>
</tr>
<tr>
<td>3(e) Special Tourist (Jack Evans Boat Harbour)</td>
<td>3.69112</td>
<td>0.00%</td>
</tr>
<tr>
<td>4(a) Industrial</td>
<td>247.143</td>
<td>0.20%</td>
</tr>
<tr>
<td>5(a) Special Uses</td>
<td>3,002.91</td>
<td>2.38%</td>
</tr>
<tr>
<td>6(a) Open Space</td>
<td>669.294</td>
<td>0.53%</td>
</tr>
<tr>
<td>6(b) Recreation</td>
<td>1097.7</td>
<td>0.87%</td>
</tr>
<tr>
<td>7(a) Environmental Protection – Wetlands &amp; Littoral Rainforests</td>
<td>1,988.3</td>
<td>1.57%</td>
</tr>
<tr>
<td>7(d) Environmental Protection – Scenic / Escarpment</td>
<td>5,803.49</td>
<td>4.60%</td>
</tr>
<tr>
<td>7(f) Environmental Protection – Coastal Lands</td>
<td>256.438</td>
<td>0.20%</td>
</tr>
<tr>
<td>7(l) Environmental Protection - Habitat</td>
<td>5,598.7</td>
<td>4.43%</td>
</tr>
</tbody>
</table>
Planning Reforms

The State Government, in an attempt to simplify the planning process in New South Wales has prepared a standard template for all Local Government Authorities to follow in the administration of planning controls.

The template includes standard definitions, zones, and clauses and requires that all Councils in the State revise and prepare new planning controls that are consistent with the template.

Tweed Shire Council in response to the new planning requirements is undertaking a review of the Shire’s planning controls in a two-stage process. The first stage involves translating the existing Tweed Local Environmental Plan 2000 over to the standard template. As a result, the zoning of all land in the Shire will largely stay unchanged or will slightly change to reflect the existing and/or desired future character of the Tweed region.

The second stage is proposed to be a comprehensive review of all planning controls in the Tweed. The second stage will involve the review of the many strategies and documents that influence how the Tweed is to develop and grow in the future.

At the end of the second stage it is possible that some planning controls and the zoning of land in the Tweed will have changed to enable a more sustainable approach to planning and development.

Management Documents

Management documents relating to the built environment include:

- Tweed Shire Strategic Plan 04/24.
- Tweed Local Environment Plan (LEP) 2000.
- Tweed Shire Development Control Plans (DCP’s).
- Site specific Locality Plans
- S.94 Contribution Plans

To view any of these documents visit [www.tweed.nsw.gov.au](http://www.tweed.nsw.gov.au)

Management Actions

To help reduce the ecological impacts associated with the built environment, Tweed Shire Council undertook the following in 2005/2006:

- Ongoing implementation of planning controls (see document list above).
- Initiated a process to link planning controls to the Geographic Information System via a computer software program. The software will link all relevant development controls to specific areas and parcels of land ensuring prompt identification of all development controls for a specific site.
- Commenced the planning reforms process as required by the NSW State Government. Refer to Planning Reforms above for more information.
Related Issues

- Waste Management
- Water Supply
- Open Space
- Transport
- Waterway Health
- Bushland and Biodiversity
- Council Operations

**WASTE MANAGEMENT**

**CONDITION**

**Solid Waste Management Goal**

To provide waste management services which are economically equitable and ecologically sustainable. (TSC 2006 a)

**2006 - 2009 Targets**

- Increase domestic waste recycling rates to >25%.
- Continued implementation of community waste minimisation education initiatives.
- Foster commercial waste minimisation through education and facilitation programs.

(TSC 2006 a)

**Sewage Waste Management Goals**

**Recommendation for Further Action:** Develop Sewage Waste Strategies that include long term environmental goals and short-term environmental targets for wastewater management.

**Liquid Trade Waste Management Goals**

Refer to *Policy for the Discharge of Trade Waste to Sewers, 1997.* This document can be found under the ‘water and sewer’ section of council’s website: [www.tweed.nsw.gov.au](http://www.tweed.nsw.gov.au)

**On-Site Sewage Management Goals:** Refer to the *On-Site Sewage Management Strategy, 2002.* This document can be found under the ‘water and sewer’ section of council’s website: [www.tweed.nsw.gov.au](http://www.tweed.nsw.gov.au)

**PRESSURE**

**Key Threatening Processes**

Key pressures associated with solid waste management in the Tweed Shire include:

- Construction waste accounts for nearly 40% of the total waste stream.
- Domestic waste accounts for over 30% of the total waste stream.
- Commercial and industrial waste accounts for nearly 20% of the total waste stream.

Key pressures associated with liquid waste management in the Tweed Shire include:

- 96% of treated effluent discharged to local waterways.
- The strength and volume of liquid trade waste continues to increase.

Failing on-site sewage management systems. Approximately 50% of on-site sewage management systems inspected to date have shown some sort of failure. Failing systems can
result in untreated effluent with high nutrient loads and bacterial levels being discharged directly to the environment.

**Indicators of Environmental Pressures**

<table>
<thead>
<tr>
<th>Indicator: Solid Waste 2005/06</th>
<th>Total (Tonnes)</th>
<th>Landfill (Tonnes)</th>
<th>Recycled (Tonnes)</th>
<th>% Recycled</th>
<th>% of Total Waste Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>27,649</td>
<td>21,089</td>
<td>6,560</td>
<td>23.72</td>
<td>32.46</td>
</tr>
<tr>
<td>Comm. and Industrial</td>
<td>16,890</td>
<td>14,525</td>
<td>2,365</td>
<td>14</td>
<td>19.83</td>
</tr>
<tr>
<td>Construction</td>
<td>33,373</td>
<td>23,512.5</td>
<td>9,860.50</td>
<td>29.54</td>
<td>39.18</td>
</tr>
<tr>
<td>Green Waste</td>
<td>2,796</td>
<td>0</td>
<td>2,796</td>
<td>100</td>
<td>3.28</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>617</td>
<td>617</td>
<td>0</td>
<td>0</td>
<td>0.72</td>
</tr>
<tr>
<td>Hard Rubbish Clean Up</td>
<td>1,506</td>
<td>500</td>
<td>1006</td>
<td>66.80</td>
<td>1.77</td>
</tr>
<tr>
<td>Other</td>
<td>2,346</td>
<td>2,346</td>
<td>0</td>
<td>0</td>
<td>2.75</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>85,177.0</strong></td>
<td><strong>62,589.5</strong></td>
<td><strong>22,587.5</strong></td>
<td><strong>26.52</strong></td>
<td><strong>99.99</strong></td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Environment & Health Unit

<table>
<thead>
<tr>
<th>Indicator: Sewer Waste</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population serviced by sewer (%)</td>
<td>81.7</td>
<td>82.2</td>
<td>82.7</td>
<td>82.7</td>
</tr>
<tr>
<td>Sewer discharges treated to secondary / tertiary standards (%)</td>
<td>20 / 80</td>
<td>20 / 80</td>
<td>20 / 80</td>
<td>20 / 80</td>
</tr>
<tr>
<td>Volume of treated effluent discharged to watercourses (Mega Litres / Year)</td>
<td>7153</td>
<td>6947</td>
<td>7510</td>
<td>7526</td>
</tr>
<tr>
<td>Volume of treated effluent reused (ML/year)</td>
<td>244</td>
<td>354</td>
<td>353</td>
<td>291</td>
</tr>
<tr>
<td>Percentage of treated effluent reused (%)</td>
<td>3.1</td>
<td>4.6</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Number of sewer overflows</td>
<td>37</td>
<td>26</td>
<td>32</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Liquid Trade Waste</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of liquid trade waste generators</td>
<td>511</td>
<td>523</td>
<td>523</td>
<td>484</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Point Source Discharges</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of EPA licensed discharges</td>
<td>31</td>
<td>30</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: NSW EPA. This figure is a combined total for both waterway and atmospheric discharges.

<table>
<thead>
<tr>
<th>Indicator: On-Site Sewage Management Systems</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of on-site sewage management systems (OSSMS)</td>
<td>Approx 4000</td>
<td>Approx 6000</td>
<td>Approx 6342</td>
<td>Approx 6450</td>
</tr>
<tr>
<td>Number of new OSSMS</td>
<td>103</td>
<td>152</td>
<td>165</td>
<td>120</td>
</tr>
<tr>
<td>Number of approvals to operate</td>
<td>N/A</td>
<td>320</td>
<td>409</td>
<td>393</td>
</tr>
<tr>
<td>Percentage of population serviced by OSSMS</td>
<td>N/A</td>
<td>Approx 18%</td>
<td>Approx 18%</td>
<td>Approx 18%</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Environment & Health Unit
RESPONSE

Management Documents

- Development Servicing Plan for Sewerage Services.
- Wastewater Activity Management Plan.

**Recommendation for Further Action:** Ensure draft Environmental Management Plan includes long-term ESD goals and short-term ESD targets for solid waste management. Link these goals and targets to current and future solid waste management documents.

Management Actions

To manage pressures associated with solid waste generation and disposal, Council undertook the following in 2005/2006:

- Produced a ‘Recycle Right’ video to help dispel some of the myths about how recyclables are collected and processed in the Tweed Shire. This video has been supplied to all primary schools as an educational resource.
- Visited fifteen local schools to educate about waste minimisation actions at home and at school.
- Production of a new and improved *Household Recycling Guide* and *Household Composting Guide* to help educate shire residents about waste minimisation.
- Increased the number of households with green waste collection bins to approximately 6,000.
- Increased the number of multi-unit dwellings with kerb-side recycling services from 38 to 111 premises.
- Installed an additional three divided bins (50% waste 50% recycling) as public litter bins.
- Adopted an *Office Waste Minimisation Strategy* for Council’s main administration building.
- Conducted an annual *DrumMuster Campaign* to collect used farm chemical containers. 2,500 drums were collected in 05/06.
- Began to co-generate electricity using methane harvested from the Stott’s Creek landfill. This electricity is being returned to the grid.

To address ecological pressures associated with sewer waste generation, Council undertook the following in 2005/2006:

- Commenced construction of Murwillumbah Tertiary Wastewater Treatment Plant to:
  - Improve the health of the Rous River and Tweed River catchment.
  - Supply treated effluent to the Condong Sugar Mill for use in the co-generation facility.
- Commenced construction of the new Kingscliff Wastewater Treatment Plant.
- Sewage Pump Stations are continuing to be upgraded to reduce sewer overflows and associated environmental harm.
Continued to implement a small number of waste-water reuse initiatives from the Waste-Water Treatment Plants at Banora Point, Hastings Point, Tumbulgum, Uki and Tyalgum.

Ran a community 'new for old' showerhead exchange in November 2005. Refer to Water Supply responses for more detail.

To address ecological pressures associated with liquid trade waste generation, Council undertook the following in 2005/2006:

- Continued to monitor and license necessary premises.
- Ongoing maintenance of the trade-waste register.

To address ecological pressures associated with on-site sewage waste generation, Council undertook the following in 2005/2006:

- Inspected approximately 600 on-site sewage management systems on properties throughout the shire, with the following results:
  - Over 300 improvement notices issued. Common improvement actions included desludging of the primary treatment tank, replacing or repairing failing effluent land application areas and installing biological septic tank outlet filters. The majority of property owners have undertaken the actions identified in the improvement notices within the allotted timeframe of six months.
  - Provided homeowners with practical educational material that helps them to improve and maintain the performance of their on-site sewage management system.
  - Improved knowledge of the operation and maintenance of on-site sewage systems by owners and operators;
  - Improved knowledge of legal responsibilities of on-site sewage system owners and operators;
  - Improved interaction and communication between Council and owner/operators of on-site sewage systems;
  - Reduced high nutrient and pathogenic contamination of land and waterways due to effluent discharge from failing on-site sewage system;

- Prepared 43 pre-purchase inspection reports. The reports identify if any operational or maintenance issues relating to the on-site sewage management system need to be rectified before the property can be occupied.

Related Issues
- Built Environment
- Waterway Health
- Atmosphere
- Community Participation
- Council Operations

WATER SUPPLY

CONDITION

Long Term Goal

To ensure an equitable supply of safe and clean potable water to the community while safeguarding the ecological sustainability of the shires creeks and river systems. (TSC 2006 a)
2006 - 2009 Targets

- Development of a ‘Demand Management Strategy’ for Council and the community.
- Improve water efficiency at existing council sites and facilities.
- Ongoing implementation of the Water Pricing Policy.
- Ongoing community education relating to water efficient fixtures and water wise behaviours.

(TSC 2006 a)

The Water Treatment Process

Clarrie Hall Dam provides storage for Tweed Shire’s water supply. When required, raw water is released from the dam and flows down the Tweed River to the Bray Park Weir. Water is drawn from the Bray Park Weir, pumped to the Water Treatment Plant and treated to remove sediments and kill bacteria and viruses. The treated water is then pumped via 20 pumping stations, to 29 reservoirs with a storage capacity of 79 Mega Litres (ML), and through more than 500 kilometres of water supply pipelines in the shire. Full details of the water treatment process can be found at: www.tweed.nsw.gov.au/PlanningBuilding/WaterHome.aspx

Annual and Daily Water Production

The capacity of the raw water pump station is currently 100 ML/day or 1260 litres / second. During normal conditions, the water flow into the plant is about 768 litres / second and following heavy rain is about 550 litres / second. Depending upon the demand, the plant runs for 10 to 18 hours a day, operating during off peak hours as much as possible to minimise electricity costs. The cost of treating one mega litre of water is approximately $50.

- The average annual demand is 130 kilolitres (kL) per person.
- The peak day production was 51.4 ML in 2002.
- The capacity of the current plant is 55 ML per day.
- The peak daily demand is 850 litres per person.
- The average daily demand is 450 litres per person.

Environmental Flows

An environmental flow is any change to the flow regime that is intended to improve river health. In other words, environmental flows are the flows that are protected or created to benefit the environment. (www.rivermurray.sa.gov.au) At this stage, environmental flows are only provided for at Clarrie Hall Dam. The new Macro Water Sharing Plans for the region indicate that a 95% flow will be required at Bray Park Weir.

PRESSURE

Key Threatening Processes

Environmental pressures associated with a growing demand on surface and ground water supplies include (but are not limited too):

- Increased water extraction rates and an associated reduction in environmental flows.
- An increase in local and national greenhouse gas emissions associated with the treatment and supply of water. (TSC, 2003)
- Increased pressures on the ability of existing surface water sources to adequately service future populations. (TSC, 2006 b)
- Altered flow patterns of natural watercourses which in turn leads to:
  - Degraded water quality.
- Reduced riverine habitat.
- Reduced flooding of riparian zones, floodplains and wetlands.
- An increase in algal blooms.
- Erosion of river channels. (DEC 2004).

### Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th>Indicator: Town Water Connections</th>
<th>00/01</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shire population connected to reticulated (town) water</td>
<td>64,624</td>
<td>66,296</td>
<td>67,982</td>
<td>69,861</td>
<td>71,394</td>
<td>73,118</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Total Water Consumption</th>
<th>00/01</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total amount of reticulated water consumed (Mega Litres)</td>
<td>9,683</td>
<td>10,349</td>
<td>8,740</td>
<td>9,537</td>
<td>9,981</td>
<td>9501</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Per Capita Water Consumption</th>
<th>00/01</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita* - Total volume of reticulated water consumed (Litres)</td>
<td>150,000</td>
<td>156,000</td>
<td>129,000</td>
<td>137,000</td>
<td>140,000</td>
<td>130,000</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit
* Includes non residential water usage.

<table>
<thead>
<tr>
<th>Indicator: User Pays Water Pricing</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge for 1000 litres (kL) of water</td>
<td>$0.60</td>
<td>$0.62</td>
<td>$0.68</td>
<td>$0.82</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Annual Rainfall Figures</th>
<th>00/01</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall at Bray Park (mm)</td>
<td>1592</td>
<td>764</td>
<td>1409</td>
<td>1371</td>
<td>1375</td>
<td>1419</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Water Restrictions</th>
<th>00/01</th>
<th>01/02</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days with water restrictions</td>
<td>0</td>
<td>0</td>
<td>123</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

<table>
<thead>
<tr>
<th>Indicator: Drinking Water Quality</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of complaints regarding quality of town water supply</td>
<td>16</td>
<td>30</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Number of times town water supply quality failed to meet standards</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit
**Indicator:** Surface Water Extraction  
**05/06**
- Number of active surface water extraction licenses: 256
- Total water allocation for active extraction licenses (ML): 62,775

Source: NSW Department of Natural Resources

**Indicator:** Ground Water Extraction

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of active groundwater extraction licenses</th>
<th>Total water allocation for active extraction licenses (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>00/01</td>
<td>402</td>
<td>1536</td>
</tr>
<tr>
<td>02/03</td>
<td>655</td>
<td>1665</td>
</tr>
<tr>
<td>05/06</td>
<td>743</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: NSW Department of Natural Resources

**RESPONSE**

**Management Documents**

Management documents relating to water use include:
- Clarrie Hall Dam Management Plan.
- Water Pricing Policy.

To view these documents visit: [www.tweed.nsw.gov.au](http://www.tweed.nsw.gov.au)

**Recommendation for Further Action:** Develop a Demand Management Strategy to manage the pressures of current and future water consumption in the shire.

**Comment:** Demand management has been identified as a priority within the Integrated Water Cycle Management Strategy and Context Study.

**Management Actions**

To manage pressures associated with increased demand on the reticulated water supply, Council undertook the following in 2005/2006:


- Conducted a case study project to quantify the benefits of using 3-star (AAA) rated showers in the home. The results indicate an average saving of 48,800 litres per household per year through the use of 3-star rated showers.

- Ran a free ‘new for old’ showerhead exchange in November 2005. Two thousand 3-star showers were distributed free of charge to shire residents via the Demand Side Abatement program of the NSW Greenhouse Gas Abatement Scheme.

- Increased the user pays charge for water from $0.62 per kilolitre in 04/05 to $0.82 per kilolitre in 05/06. NB: 06/07 user pays charge is $1.04 per kilolitre.
Provided free technical support to a number of community organisations that applied for the Federal Governments ‘Community Water Grants’. This work is ongoing as it supports the objectives of the Integrated Water Cycle Management Strategy.

Adopted a ‘Rainwater Tank Policy’ for the shire to complement the NSW Building and Sustainability Index (BASIX).

Promoted the installation of domestic rainwater tanks as ‘exempt development’ via a SEPP 4 checklist brochure.

Continued to trial waterless urinals within Council’s main administration building. This trial will help to determine the most appropriate way to phase-in waterless urinals in council facilities and public toilets.

Completed upgrades of the Murwillumbah and Duranbah reservoirs and Water Pumping Stations No. 2 & 3.

Completed designs for the Bray Park Water Treatment Plant Upgrade. Construction of the new plant will commence in mid 2007.

These initiatives have contributed to the following outcomes:

- A 5% reduction in total annual town water consumption.
- A 7% reduction in annual per capita town water consumption.
- A noticeable increase in community awareness about water efficient behaviours.

To manage pressures on drinking water quality, Council undertook the following in 2005/2006:

- Ongoing monitoring of the reticulated water supply. Results are checked against the Guidelines for Drinking Water Quality in Australia (1987).
- Commenced implementation of the Streambank Protection Policy which provides assistance for property owners to protect and enhance their riparian zones.

To manage pressures on the groundwater supply, Council undertook the following in 2005/2006:

- Groundwater use is managed by the NSW Department of Natural Resources. Tweed Shire Council has not undertaken any specific initiatives to manage pressures on the groundwater supply at this stage.

Related Issues

- Built Environment
- Waste Management (Sewer)
- Waterway Health
- Community Participation
- Council Operations

TRANSPORT

CONDITION

Long Term Goal

To facilitate sustainable transport networks in the shire through an integrated approach to urban form and design, infrastructure planning and community education.
2006 – 2009 Target
Develop an Integrated Transport / Land Use Plan that aims to reduce dependence on cars by improving walking/cycling networks and access to public transport; providing facilities nearby so people travel shorter distances; and encouraging multi-purpose / multi-occupant trips, which reduces the total number of trips.

PRESSURE

Key Threatening Processes
A dependence on car-based transport is placing many adverse pressures the natural environment, including (but not limited too):
- Vehicle related greenhouse gas emissions are forecast to double by 2010 (based on 1996 emission levels). (TSC 2003)
- Vehicles are forecast to become the biggest source of local greenhouse gas emissions by 2010. (TSC 2003)
- An increase in impervious surfaces (e.g. roads and car parks) leads to increased stormwater discharges and associated pollution of local waterways.
- An increase in transport infrastructure and associated urban footprint.

Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th>Indicator: Vehicle Numbers</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of vehicles registered in the shire.</td>
<td>45,882</td>
<td>48,257</td>
<td>50,335</td>
<td>51,756</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Indicator: Single Occupant Vehicle Travel</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of passenger vehicles with one occupant</td>
<td>N/A</td>
<td>64%</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council survey.

<table>
<thead>
<tr>
<th>Indicator: Transport Alternatives</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length of new footpath constructions (metres)</td>
<td>2400</td>
<td>3989</td>
</tr>
<tr>
<td>Total length of new bikeway constructions (metres)</td>
<td>2500</td>
<td>2324</td>
</tr>
<tr>
<td>Total number of new bus shelter constructions</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Total number of new taxi shelter constructions</td>
<td>N/A</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Works Unit
RESPONSE

Management Documents
Management documents relating to transport include:

- S.94 Contribution Plan – 12, Bus Shelters.
- Community Road Safety Plan.

These documents are available at www.tweed.nsw.gov.au

Management Actions
In response to environmental pressures created by the current preferred modes of transport, council undertook the following in 2005/2006:

- Constructed nearly 4 kilometres of new footpaths.
- Constructed over 2 kilometres of new cycle ways.
- Established a cycle-ways and footpath directory on council’s website.
- Produced a guide detailing the public transport routes within the shire. This document is available at www.tweed.nsw.gov.au

Related Issues
Built Environment
Waterway Health
Atmosphere
Recommendation for Further Action: Develop a Noise Management Policy that aims to address noise amenity issues associated with conflicting land uses.

In today’s society, noise levels are increasingly impinging on our work, recreation and personal lives. Tolerance of noise is subjective, depending on circumstances and individual sensitivity. Council aims to address noise issues on their merit and attempts to resolve situations through all reasonable and practical measures such as community education, conflict resolution and the application of legislation.

PRESSURE

Key Threatening Processes

Key noise related pressures include (but are not limited too):

- Barking dogs.
- Conflicting land-uses.
- Reduced interaction between neighbours (which reduces the chance of noise related problems being resolved by those concerned).

Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th>Indicator: Noise Complaints</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of noise complaints received by council</td>
<td>168</td>
<td>147</td>
<td>132</td>
<td>358</td>
</tr>
<tr>
<td>No. of noise complaints received by EPA</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Environment & Health Unit, NSW EPA. Note: All noise complaints have been identified, regardless if multiple complaints have been made by the same person about a single issue.
**Indicator: Noise Complaints by Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>75%</td>
</tr>
<tr>
<td>Motor Bikes</td>
<td>7%</td>
</tr>
<tr>
<td>Industrial / Commercial</td>
<td>5%</td>
</tr>
<tr>
<td>Loud Music / Parties</td>
<td>3%</td>
</tr>
<tr>
<td>Home Businesses</td>
<td>2%</td>
</tr>
<tr>
<td>Pool Pumps / Air Conditioners</td>
<td>2%</td>
</tr>
<tr>
<td>Construction Activities</td>
<td>1%</td>
</tr>
<tr>
<td>Others -</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Environment & Health Unit

**RESPONSE**

**Management Documents**

- Animal Keeping Guidelines
- Tweed Local Environmental Plan, 2000

**Management Actions**

To address noise issues, Council undertook the following actions in 2005/2006:

- To address the issue of barking dogs, Council responds to complaints, provides educational material to dog owners regarding physical exercise and mental stimulation for their dogs and enforces legislation where required.
- Neighbourhood noise issues are generally responded to in a way that aims to resolve the noise related dispute between neighbours through communication, compromise and regulatory means (where required).
- Ongoing control of noise from developments via conditions of consent placed on the development and building approvals.
- Ongoing requirement for adequate soundproofing on new dwellings in areas affected by aircraft noise.
Related Issues

Built Environment
Open Space
Community Participation

OPEN SPACE

CONDITION

Parks / Playgrounds / Sporting Fields
Council maintains large areas of open space to provide recreational opportunities for residents and to ensure that the Shire remains a safe, healthy and attractive place to live. The Shire’s network of open space includes 286 parks, 80 playgrounds, and 32 playing fields.

PRESSURE

Key Threatening Processes
Open space management places a range of pressures on the natural environment including (but not limited too):

- Water consumption for irrigation purposes.
- Fertiliser and pesticide use.
- Fuel consumption associated with mowing and other maintenance.

Indicators of Environmental Pressures

**Recommendation for Further Action:** Develop indicators of environmental pressures associated with open space management. E.g. Volumes of pesticide / fertiliser / fuel use.

RESPONSE

Management Documents
Management documents relating to open space include:

- Tweed Shire Open Space Infrastructure Policy, 2002.

**Recommendation for Further Action:** Incorporate environmental management goals and targets into the next scheduled review of Open Space Infrastructure Policy or other documents as appropriate.

Management Actions

To manage environmental pressures associated with the use of town water in council reserves, Council has implemented the following:

- Ongoing investigations to identify alternatives to irrigation from town water supplies.
- Irrigation occurs predominantly in the evening to reduce evaporation loss.
Active monitoring of grass growth and weather conditions to minimise water use.

To manage environmental pressures associated with the use of fertilisers and pesticides, Council has implemented the following:

- Implementation of ChemCert training and the ChemAlert tracking system.
- Safe Operating Procedures relating to fertilisers and pesticides.
- Phasing out high maintenance gardens (e.g. rose beds) and replacing them with drought tolerant native gardens.
- Increased use of organic fertilisers.
- No environmental weeds (actual or potential) are planted in council reserves.

To manage environmental pressures associated with the use of petrol-powered mowers, Council has implemented the following:

- Mowing schedules are continually reviewed to identify optimum mowing frequency.
- Actively moving towards a reduction in mowing frequency through equipment selection.
- Improvements in mower maintenance schedules and procedures to reduce fuel consumption and associated emission levels.

Related Issues
- Built Environment
- Water Supply
- Waterway Health
- Bushland and Biodiversity
- Atmosphere
- Council Operations

NATURAL & CULTURAL HERITAGE

CONDITION

Background

Natural and cultural heritage defines our sense of place. Heritage places and objects provide cultural and physical links with the past, with the history of human habitation, and with the evolution of plants, animals and the physical landscape. Heritage helps define our identity, providing a context in which we find meaning and definition about who we are and who we might be. Heritage helps us express our values and aspirations about the world. (DEH 2001)

Aboriginal Heritage Sites

For more than 60 000 years, Aboriginal and Torres Strait Islander people have left signs of their occupation in Australia. Aboriginal and Torres Strait Islander people's heritage is an important element of the whole of Australia's heritage. Their heritage is of continuing significance, creating and maintaining continuous links with the people and the land. Places that hold great meaning and significance to Indigenous people include: places associated with Dreaming stories depicting the laws of the land and how people should behave; places that are associated with their spirituality; places where other cultures came into contact with Indigenous people; and places that are significant for more contemporary uses. (www.deh.gov.au/heritage/indigenous/index.html)
To find out more about Aboriginal heritage sites in NSW visit [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au) or call the NSW Department of Environment and Conservation on (02) 9585 6470.

**Heritage Conservation Areas**

A heritage conservation area is a geographical area containing many different elements which collectively have historical importance. They usually have a distinct visual unity and character which contribute to create a *sense of place*. Examples of heritage conservation areas in the shire include (the majority of) Uki village and the riverside area of Tumbulgum village.

**World Heritage Sites**

Mount Warning National Park, Nightcap National Park and Border Ranges National Park were added to the World Heritage List in 1996 because they;

- Are outstanding examples representing the major changes of the earth's evolutionary history.
- Are outstanding examples representing significant ongoing geological process, biological evolution and human interaction with the natural environment.
- Contain unique, rare or superlative natural phenomena, formations or features, or areas of exceptional natural beauty.
- Are places where populations of rare or endangered species of plants and animals still survive.


**Indicator: Heritage Sites**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Aboriginal sites</td>
<td>271</td>
<td>271</td>
<td>272</td>
<td>272</td>
</tr>
<tr>
<td>No. of built sites</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>No. of natural sites</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council & Department of Environment & Conservation

**Cultural Facilities**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Library Visits</td>
<td>273,918</td>
<td>265,821</td>
<td>296,488</td>
<td>291,722</td>
</tr>
<tr>
<td>Number of Art Gallery Visits</td>
<td>20,157</td>
<td>28,098</td>
<td>51,456</td>
<td>50,0022</td>
</tr>
</tbody>
</table>

Source: Richmond -Tweed Libraries & Tweed Shire Council

**PRESSURE**

**Key Threatening Processes**

Pressures on natural and cultural heritage sites include (but are not limited too):

- Land clearing for building, road construction and landscaping.
- Vandalism.
- Natural weathering of sites.
RESPONSE

Management Documents
Management documents relating to natural and cultural heritage include:
- Stretching Cultural Dimensions, Five-year Cultural Program Plan.
- Tweed River Regional Museum Development Strategic Plan.
- Tweed Festivals and Events Strategic Plan (still to be adopted).
- Community Based Heritage Study.

Related Issues
- Human Settlement
- Catchment Management

COMMUNITY PARTICIPATION

CONDITION
Community participation to help address local environmental issues is vital. Community participation:
- Gives a human face to environmental issues.
- Empowers people to become active agents of sustainable and equitable development.
- Promotes an understanding that communities are pivotal to changing attitudes towards environmental issues.
- Advocates partnerships which will ensure all people enjoy a safe and prosperous future.

PRESSURE

Barriers to Volunteerism
There are many factors which may prevent a community member from becoming active in a community group and which may deter potential volunteers. These include:
- Time constraints.
- A group’s lack of resources to support volunteers.
- Difficulties with accessing and travelling to meeting venues.
- Intensive training requirements.
- Public liability insurance issues.
A lack of awareness about the existence of local environmental volunteer groups. (Hornsby Shire Council, 2003)

Resources for Environmental Volunteerism

For restoration of bushland within the Shire to be effective, ongoing funds, volunteer time and wide community support are required. New weed-infested areas cannot be worked unless sufficient funds for follow up works are available. Increased resources are necessary to cope with the increase in volunteer numbers occurring through time, and to ensure that volunteers are well trained, informed, and serviced with materials. (Hornsby Shire Council 2003)

Lack of Awareness / Action

While most people are concerned about environmental issues, many people are unaware of the impact their day-to-day activities have on the environment. With a growing population, a lack of community action relating to sustainable behaviours represents a growing pressure on the local environment.

Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th>Indicator: Environmental Volunteers</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of volunteer environmental groups in the shire*</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Number of registered members in Landcare/Coastcare groups**</td>
<td>518</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Source: TSC Community Directory & Tweed Landcare Inc. **Source: Tweed Landcare Inc.

Waste Generation Indicators: Refer to Waste Management section.
Water Consumption Indicators: Refer to Water Supply section.
Greenhouse Gas Generation Indicators: Refer to Atmosphere section.

RESPONSE

Management Documents

Management plans relating the community participation include:

- Tweed Shire Strategic Plan 2004 – 2024.

Recommendations for Further Action:

Develop and implement a Volunteers Policy to overcome barriers to volunteerism.

Develop and implement an Environmental Education Strategy to foster sustainable behaviours in the wider community.

Management Actions

To help address barriers to environmental volunteerism, Tweed Shire Council undertook the following in 2005/2006:

- Initiated a process to develop a volunteer’s policy to address issues such as resourcing, training, insurance etc.
- Continued to strengthen networks with local environment groups (e.g. LandCare)
- Ongoing support to Dunecare groups in the form of tools, plants and training.
Continued to maintain the ‘Directory of Community Resources’ a web based directory of local community groups and volunteer organisations.
Continued to operate the Uki Community Plant Nursery.

To help address a lack of environmental awareness and action, Tweed Shire Council undertook the following in 2005/2006:

Constructed a 3D working model of a typical north coast catchment. Housed in a box trailer for portability, the Catchment Activity Model (CAM) visits schools and festivals to raise awareness about the impact of day to activities on the local environment and how these activities can be altered to reduce environmental harm. In 2006 CAM visited 10 schools and 4 community events. More information on the CAM initiative can be found at: www.tweed.nsw.gov.au ‘environment’ ‘sustaining the tweed’.

Conducted a local case study and associated product giveaway to encourage households to use water wise showers, energy smart lights and greenpower electricity. Full details of the Big 3 for Green Living project can be found at www.tweed.nsw.gov.au ‘environment’ ‘sustaining the tweed’.

Coordinated the 2005 Tweed River Festival and the 2006 World Environment Day Festival.

Related Issues

Built Environment
Waste Management
Water Supply
Waterway Health
Bushland and Biodiversity
Atmosphere
INTRODUCTION

It is important to note that this report breaks catchment management into three categories being:

- **Waterway Health.**
- **Bushland and Biodiversity.**
- **Soil Landscape.**

This is purely for reporting purposes. An integrated approach to catchment management is being progressively implemented by a number of organisations including (but not limited too):

- **Northern Rivers Catchment Management Authority (NRCMA)**
- **Tweed Shire Council**
- **Tweed River Committee**
- **Tweed Landcare Inc**
- **Far North Coast Weeds**
- **NSW Department of Environment and Conservation (DEC)**
- **NSW Department of Primary Industries (DPI)**
- **NSW Department of Natural Resources (DNR)**

In 2006 Tweed Shire Council has sought to align the *Catchment Management* section of the State of the Environment Report with the NRCMA reporting processes, in particular, the sub-catchment boundaries of the Tweed catchment.

**WATERWAY HEALTH**

**CONDITION**

**Long Term Goals**

- Ensure Council’s approval processes and operational activities conserve and enhance the ecological sustainability of local waterways
- Foster behaviors within the local community that conserve and enhance the ecological sustainability of local waterways
- Improve the waterway health of priority sub-catchments, estuaries, wetlands and the coastal zone by improving flow regimes and water quality. (TSC 2006 a)

**2006 - 2009 Targets**
Ongoing implementation of the ‘On-Site Sewerage Management Strategy’

Develop and adopt an Integrated Water Cycle Management Strategy for the Tweed Catchment

Ongoing implementation of Tweed River Management Plans, sub-catchment management plans, Urban Stormwater Quality Management Plan, DCP 16, and site specific management plans for local waterways.

Continued delivery of waterway health education programs (TSC 2006 a)

Note: The following descriptions of the Tweed River Catchment and the Tweed Coast Estuaries do not coincide with the sub-catchment boundaries identified by the NRCMA. They have been sourced from the Tweed Urban Stormwater Quality Management Plan which was written before the NRCMA sub-catchment boundaries were identified. These descriptions will be replaced as more detailed sub-catchment information becomes available.

Tweed River Catchment

The Tweed catchment is both rugged and compact. It covers an area of approximately 1100 km². Upstream of Murwillumbah the drainage pattern from minor tributaries is fairly symmetrical, due to the valley's volcanic origin. In contrast, downstream of Murwillumbah the Tweed River weaves a path across an extensive flood plain.

The Rous River joins the Tweed River at Tumbulgum in the upper estuary. Both Terranora and Cobaki Broadwaters flow into Terranora Inlet, which discharges into the Tweed River near Tweed Heads. The broadwaters are shallow (0.5m - 1.5m) and are fed by Bilambil, Duroby and Cobaki Creeks. The Tweed River discharges into the Pacific Ocean at Point Danger.

Water quality varies within the Tweed River estuarine system. The lower estuary is well flushed and has good water quality. Times of poor water quality are directly related to rainfall events. The main arm of the river is periodically subjected to severe impacts due to runoff from acid sulfate soils within the catchment.

Water quality in the upper estuary declines from Chinderah to Murwillumbah due to the reduction in tidal flushing. It is heavily impacted by upstream sources and discharges from drains. The Rous River is close to being eutrophic with high levels of nutrient, algae and turbidity. The Rous River contributes high levels of nutrients to the Tweed River when it joins the main arm at Tumbulgum.

Terranora Inlet is well flushed by tidal movement, being the stretch of water that links Terranora and Cobaki Broadwaters to the mouth of the Tweed River. It is, however, subject to a high level of pollutant inputs from the adjacent heavily urbanised area including several canal estates. Terranora Inlet also is the receiving waters for two sewage treatment plant outfalls. Terranora and Cobaki Broadwaters are both shallow water bodies with reasonable water quality. They are subject to nutrient and sediment accumulation from the catchment. Terranora Broadwater catchment has substantial existing and future urban development and Cobaki Broadwater catchment will be developed within the next five to ten years. (TSC 2000 b)

Tweed Coast Estuaries

Cudgen Creek has its mouth near the township of Kingscliff. It follows a meandering course, 9.4km in length to Cudgen Lake at Bogangar. Cudgen Lake covers an area of 1.65 km² and is generally less than 2 metres deep. (TSC 2000 b)

Generally water quality in this system is good, however following periods of heavy rain most water quality parameters exceed water quality objectives. Following an analysis of 4 years worth of water quality data in 2005, the following conclusions have been drawn:

- Faecal coliform counts are sometimes high.
- Dissolved oxygen can be low, particularly during the wet season.
- Suspended solids and chlorophyll a are generally low.
Nitrogen is sometimes high, perhaps related to stormwater runoff.

**Cudgen Lake** has been subject to several major fish kills due to impacts from the presence of actual Acid Sulfate Soils within the catchment. Cudgen Creek and Lake have a catchment of approximately 66km². There is substantial existing and future urban development with potential to adversely impact on Cudgen Creek. (TSC 2000 b)

**Cudgera Creek** meets the sea at Hastings Point. It has a reasonably straight channel and follows a 3.5km course south to Pottsville. It has three major branches, Christies Creek opposite the mouth, Palmvale Creek which branches off at North Pottsville, and Cudgera Creek continues to the south. Cudgera Creek has a relatively small catchment of approximately 50km². The majority of drainage enters the creek via Palmvale Creek. Cudgera Creek catchment contains some urban development, predominantly near the mouth of the Creek with some development further upstream at the Koala Beach and Seabreeze Estate subdivisions. (TSC 2000 b)

Following an analysis of 4 years worth of water quality data in 2005, the following conclusions have been drawn:

- Generally, water quality in the upper sections of Cudgera Creek is compromised by catchment runoff and relatively restricted tidal exchange.
- Faecal coliform objectives are often exceeded in the upper creek, as a result of urban stormwater, agricultural runoff and perhaps wildlife.
- Dissolved oxygen levels are sometimes low in the upper creek.
- Total nitrogen is above objectives.

**Mooball Creek** is the largest and most southern of the three creeks. The waterway runs parallel to the coastal dunes, extending approximately 9km south from its mouth at Potts Point. Mooball Creek has a catchment of approximately 117km² which is dominated largely at its southern end by cane farming activities. Mooball Creek is joined by Crabbes Creek which is the major drainage system in the area as well as a number of other tributaries. An extended horseshoe-shaped canal system with two openings to Mooball Creek is located approximately 1.8km from the mouth. Pottsville has a relatively large urban area with further development occurring at Black Rocks estate. (TSC 2000 b)

Following an analysis of 4 years worth of water quality data in 2005, the following conclusions have been drawn:

- Faecal coliform levels are within objectives for Mooball Creek.
- Suspended solids and chlorophyll a levels are low, indicating good water clarity.
- Total nitrogen is above desired objectives in the upper creek, indicating agricultural runoff and perhaps urban stormwater runoff.

**NRCMA Sub -Catchment Report Cards**

Tweed Shire Council has sought to align its SoE reporting with the reporting processes of the Northern Rivers Catchment Management Authority (NRCMA). The NRCMA has prepared report cards for each of the sub-catchments within the Tweed catchment. These report cards provide a description of the condition of each sub-catchment and can be found at [http://www.northern.cma.nsw.gov.au/water.html](http://www.northern.cma.nsw.gov.au/water.html)

**Riparian Vegetation**

Refer to the *Bushland and Biodiversity* section of this report for details on the type and condition of riparian vegetation in the shire.
PRESSURE

Pressures in Sub-Catchments

Following are the main sub-catchments of the Tweed Valley, grouped loosely into those systems which are exclusively freshwater, those which have fresh and estuarine reaches, and those which are exclusively estuarine.

Following this list is a summary of the key pressures faced in all of these sub-catchments.

Freshwater Systems

Brays Creek  Mid Rous River  Upper Oxley River
Byrrill Creek  Mid Tweed River  Upper Rous River
Crystal Creek  Nobby’s Creek  Upper Tweed River
Clothiers Creek  Pumpenbil Creek  Kunghur Creek
Doon Doon Creek  Rowland’s Creek  Perch Creek
Hopping Dicks Ck  Sheens Creek  Commissioners Creek
Lower Burringbar River  Smiths Creek
Lower Oxley River  Upper Burringbar River

Combined Fresh and Estuarine Systems

Bilambil Creek  Dunbible Creek  Piggabeen Creek
Christies Creek  Dungay Creek
Cobaki Creek  Duroby Creek

Estuarine Systems

Cobaki Broadwater  Cudgera Creek  Terranora Broadwater
Cudgen Lake  Mooball Creek  Tweed Estuary

Key Threatening Processes

Key pressures on shire waterways include (but are not limited too):

Degraded water quality (high sediment / nutrient loading and occasional high coliform counts, particularly following heavy rain).

Barriers to fish passage (weirs and road crossings).

Acid sulphate soils (low pH and metals runoff to waterways).

Invasive environmental weeds in riparian vegetation, particularly vines.

Point source pollution (sewage effluent discharges, industrial discharges)

Poorly maintained on-site sewage management systems and septic tanks.

Stormwater discharges from urban development

Runoff from agricultural activities (fertiliser/pesticide runoff, erosion of topsoil)

Stock access to waterways leading to erosion and fouling of water

Irrigation / river water extraction

Riparian vegetation clearing and degradation

Stream bank erosion (from both high flow events and wake)
Indicators of Environmental Pressures

**Indicator: Exceedence Percentages of Freshwater Objectives (Upper Tweed River)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>pH</th>
<th>Dissolved Oxygen</th>
<th>Suspended Solids</th>
<th>Total Phosphorus</th>
<th>Total Nitrogen</th>
<th>Chlorophyll a</th>
<th>Faecal Coliforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units:</td>
<td></td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>ug/L</td>
<td>No/100mL</td>
</tr>
<tr>
<td>Freshwater Quality Objectives</td>
<td>6.5 to 9</td>
<td>&gt; 6</td>
<td>&lt; 20</td>
<td>&lt;0.10</td>
<td>&lt; 0.75</td>
<td>&lt; 10</td>
<td>&lt; 150</td>
</tr>
<tr>
<td>2001/02</td>
<td>0%</td>
<td>29.5%</td>
<td>4.9%</td>
<td>12.3%</td>
<td>10.7%</td>
<td>0%</td>
<td>43.5%</td>
</tr>
<tr>
<td>2002/03</td>
<td>0%</td>
<td>5.7%</td>
<td>2.8%</td>
<td>11.4%</td>
<td>8.6%</td>
<td>N/A</td>
<td>25.7</td>
</tr>
<tr>
<td>2003/04</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
<td>22%</td>
<td>N/A</td>
<td>39%</td>
</tr>
<tr>
<td>2004/05</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>7%</td>
<td>N/A</td>
<td>33%</td>
</tr>
<tr>
<td>2005/06</td>
<td>0%</td>
<td>20%</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
<td>NA</td>
<td>13%</td>
</tr>
</tbody>
</table>

**Indicator: Exceedence Percentages of Estuarine Water Objectives (Chinderah Reach, Tweed Estuary, Rous River)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>pH</th>
<th>Dissolved Oxygen</th>
<th>Suspended Solids</th>
<th>Total P</th>
<th>Total N</th>
<th>Chlorophyll a</th>
<th>Faecal Coliforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units:</td>
<td></td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>mg/L</td>
<td>ug/L</td>
<td>No/100mL</td>
</tr>
<tr>
<td>Estuarine Water Quality Objectives</td>
<td>7 to 9</td>
<td>&gt; 6</td>
<td>&lt; 10</td>
<td>&lt; 0.05</td>
<td>&lt; 0.5</td>
<td>&lt; 10</td>
<td>&lt; 14 raw shellfish &lt; 150 primary contact</td>
</tr>
<tr>
<td>2001/02</td>
<td>0%</td>
<td>15%</td>
<td>5.1%</td>
<td>12.1%</td>
<td>15.4%</td>
<td>N/A</td>
<td>31.4% raw shellfish 7.3% primary contact</td>
</tr>
<tr>
<td>2002/03</td>
<td>0%</td>
<td>22.8%</td>
<td>5.3%</td>
<td>19.3%</td>
<td>21%</td>
<td>N/A</td>
<td>26.3% raw shellfish 7% primary contact</td>
</tr>
<tr>
<td>2003/04</td>
<td>4.3%</td>
<td>24.6%</td>
<td>10%</td>
<td>31.9%</td>
<td>24.6%</td>
<td>N/A</td>
<td>31.9% raw shellfish 5.8% primary contact</td>
</tr>
<tr>
<td>2004/05</td>
<td>0%</td>
<td>17%</td>
<td>55%</td>
<td>47%</td>
<td>7%</td>
<td>N/A</td>
<td>30% raw shellfish 6% primary contact</td>
</tr>
<tr>
<td>2005/06</td>
<td>0%</td>
<td>42%</td>
<td>58%</td>
<td>56%</td>
<td>9%</td>
<td>NA</td>
<td>38% shellfish 0% primary contact</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit

**Indicator: Water Pollution Incidents**

<table>
<thead>
<tr>
<th>Year</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of water pollution complaints</td>
<td>25</td>
<td>23</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Number of Penalty Infringement Notices (PIN's) issued for likely** or actual water pollution</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Water pollution complaints are sourced from council records and the EPA pollution hotline. PIN’s are sourced from council records. *PIN’s are issued under the Protection of the Environment Operations (POEO) Act ‘Likely or actual water pollution’ and the Environmental Planning and Assessment Act ‘failure to comply with conditions of consent’. **Under the POEO Act PIN’s can be issued for offences that are likely to cause water pollution e.g. placing dirt stockpiles in a location that is likely to cause water pollution.

**Indicator: EPA Licensed Discharges**

<table>
<thead>
<tr>
<th>Year</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number EPA licenses</td>
<td>31</td>
<td>30</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>Number of times EPA licenses were not complied with</td>
<td>N/A</td>
<td>9</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

*Information sourced from EPA Public Register. Total number of EPA licensed discharges is a combined total for both waterway and atmospheric discharges. To view details of non-compliance visit the EPA public register at [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)
<table>
<thead>
<tr>
<th>Indicator: Stormwater Treatment</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of urban collection catchments</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>% of urban catchment serviced by stormwater system</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>% of urban stormwater treated to primary/secondary/tertiary standards</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Planning & Infrastructure Section

Note: Since 2000 new developments have been required to install stormwater treatment devices as a condition of approval.

RESPONSE

Management Documents

Management documents that aim to address pressures on our local waterways include:
- Northern Rivers Catchment Action Plan, 2004 (NRCMA).
- Mooball Creek Reserve Rehabilitation and Management Plan, 2003

Management Actions

Tweed Shire Council has implemented the following ongoing actions to address degraded water quality in sub-catchment waterways:
- Assisted in the revegetation of riparian areas at Bilambil, Uki, Tyla gum, Tumbulgum, Murwillumbah, Pottsville, and Byangum.
- Developed a program to assist land-holders throughout the catchment to manage their riparian zones in a more sustainable manner.
- Maintained the Tweed River Committee and its integrated approach to river management and promotion throughout the Shire.

These actions have delivered the following outcomes:
- Increased the extent of riparian vegetation in project areas, ultimately leading to greater stream bank stability and habitat value.
- Increased the profile and importance of rural land management as a contributor to good quality water in the Shire.
To remove barriers to fish passage, Tweed Shire Council has undertaken the following:

- Worked with NSW Fisheries to identify priority fish passage barriers and commenced steps to complete their removal.

These actions have delivered the following outcomes:

- Identification of fish passage barriers at road crossings at Rowlands Creek, Crystal Creek and the Oxley River.
- Improved fish passage through installation of tidal gates on cane drains at Dinsey Creek, Condong Creek, Leddays Creek, Bartletts Creek, North Tumbulgum, Tygalgah and Christies Creek.
- Creation of a ‘fish passage barrier’ layer on Council’s Geographic Information System.

To reduce acid sulfate soil runoff, Tweed Shire Council has undertaken the following:

- Refer to the Soil Landscape section for detail on acid sulfate soil mitigation.

To manage the ecological impacts of point source pollution, Tweed Shire Council has undertaken the following:

- Council continues to operate a twenty-four hour emergency response line for water and sewer incidents.
- The pump station monitoring telemetry system has been upgraded Shire wide.
- A number of sections of sewer have been relined.
- All potential sewer overflow points have been identified.
- Designs to re-route effluent from the Murwillumbah treatment plant that discharges into the Rous River are finalised. Effluent will now be sent to the Condong sugar mill where it will be used as cooling water in the cogeneration process and then released into a section of the river that is better flushed.

These actions have delivered the following outcomes:

- A reduction in point source pollution resulting from sewerage system overflows.
- The frequency and severity of sewerage system overflows has been reduced, and Council’s ability to react to manage over flows in increased.

To manage the ecological impacts of poorly functioning and failing on-site sewage management systems, Tweed Shire Council has undertaken the following:

- Refer to the Waste Management section of this report.

To manage the ecological impacts associated with stormwater discharges from urban development, Tweed Shire Council has undertaken the following:

Stormwater run off is a major pollution source of the Tweed River. Water that runs off our roads, gutters, car parks and developed areas is polluted with litter, cigarette butts, organic material, oils and sediment. Council is striving to achieve the reduction of existing urban pollutant loads, through the installation of Stormwater Quality Improvement Devices (SQID’s) on high priority stormwater outfalls and through education programs. To date, SQID’s have been installed at the following locations:

- Tweed Heads South industrial and commercial area. A litter boom and large gross pollutant trap were placed on the open channel that drains into Ukerebagh Passage, which is an important estuarine wetland.
- Duffy Street, Tweed Heads South. A litter trap and artificial wetland were constructed on open stormwater drain that drains into Ukerebagh Passage.
- Knox Park Pond and Lavender Creek, Murwillumbah. Riparian plantings along Lavender Creek and wetland plantings at the inlet and outlet points of Knox Park Pond.
o Cudgen Creek, Kingscliff. Two litter traps were installed on stormwater lines that drain into Cudgen Creek at Kingscliff.

o Commercial area, Kingscliff. Litter traps have been installed in the gully pits along the main commercial area of Kingscliff.

o Cabarita Beach. Litter traps have been installed in the stormwater lines at Cabarita Beach.

Since April 2000 all new subdivisions and major developments in the shire have been required to install stormwater quality treatment devices in accordance with the *Tweed Urban Stormwater Quality Management Plan, 2000*. Options include (but are not limited too) artificial wetlands that cover a minimum of 5% of the land to be subdivided, end of pipe stormwater treatment devices and infiltration basins in suitable soil types.

**These actions have delivered the following outcomes:**

In existing developed areas where SQID’s have been installed, there will be a decrease in the amount of litter, sediment and nutrients entering waterways.

In new development areas, the potential impact on waterways will be less due to the presence of stormwater treatment devices.

**To manage the ecological impacts of agricultural activities (including stock access) adjacent to waterways, Tweed Shire Council has undertaken the following:**

Implemented a river health grants scheme that promotes and supports improved riparian land management in rural areas.

Refer to the [Soil Landscape](#) section of this report for additional responses.

**These actions have delivered the following outcomes:**

Meetings to discuss improved land management are arranged with farmers, leading to negotiated agreements where Council supplies materials for fencing or other works that will protect or enhance stream banks.

Where appropriate, Council has supplied fencing and drinking troughs to improve stock management adjacent to waterways.

**To manage the ecological impacts of invasive environmental weeds alongside waterways, Tweed Shire Council has undertaken the following:**

Undertaken weed control in association with riparian restoration projects at a number of locations throughout the Shire.

Implemented a major sub-catchment rehabilitation project in Byrrill Creek, targeting the removal of invasive weeds from high conservation value riparian rainforest.

**These actions have delivered the following outcomes:**

Reduced the extent of serious weeds such as Maderia Vine, Cats Claw Creeper and Privet in these areas.

**To manage the ecological impacts of degraded riparian vegetation, Tweed Shire Council has undertaken the following:**

Implemented the Byrrill Creek Riparian Rehabilitation Plan as noted above.

Contributed to implementation of NRCMA projects in the Brays, Back, Lower Oxley and Upper Tweed priority sub-catchments, all of which focus on the conservation of high quality riparian vegetation.

Refer to [Bushland and Biodiversity](#) section of this report for more information relating to riparian vegetation.
These actions have delivered the following outcomes:

Significant areas of riparian vegetation have been protected from threats such as weed infestation and agreements to improve condition of vegetation implemented with land-holder cooperation.

Related Issues

- Built Environment
- Water Supply
- Waste Management
- Community Participation
- Natural and Cultural Heritage
- Bushland and Biodiversity

**BUSHLAND AND BIODIVERSITY**

**CONDITION**

**Long Term Goal**

To protect and enhance the regions native biological diversity by ensuring ecologically sustainable management practices.

**2006 - 2009 Targets**

- Commence implementation of the Tweed Shire Vegetation Management Strategy.
- Promote a cooperative and integrated approach between Tweed Shire Council, relevant State government bodies and the Tweed community to help achieve the long-term goal for bushland and biodiversity.
- Work with relevant stakeholders to implement weed management control programs in weed hotspots throughout the shire.
- Work with relevant stakeholders to commence ongoing community education initiatives aimed at raising awareness about the regions biodiversity and the pressures faced.

**A Region of Biodiversity Significance**

The biogeographical region that includes the Tweed Shire is regarded nationally and internationally as a significant centre for biodiversity. The region supports both tropical and temperate species, many of which at the limits of their range (McDonald & Elsol, 1984).

In terms of the number of species present, Tweed Shire has one of the highest vertebrate biodiversity of any region in Australia. Figures compiled by the Australian Nature Conservation Agencies State of the Environment Report (1996) suggest that the region supports more species of bird, fish, amphibian, and mammals than Kakadu, and a similar numbers of reptiles. Only in the wet tropics are similar numbers of species found within these animal groups. Land clearing (i.e. habitat loss) within the region has helped to create an extensive list of rare, vulnerable and endangered species.
Bushland Cover in the Tweed Shire

- Sustantially cleared for agricultural and urban use: 48%
- Bushland in National Parks and nature reserves: 16%
- Other Bushland: 36%

Source: TSC 2004 c

Bushland Communities in the Tweed Shire

- Rainforest and Riparian: 15.40%
- Sclerophyll Forest (Bedrock): 20.20%
- Sclerophyll Forest/Woodland (Sand/Alluvium): 0.50%
- Melaleuca and Swamp She-Oak: 0.80%
- Heathlands: 0.70%
- Estuarine Complexes: 0.50%
- Sedgelands etc: 2.90%
- Miscellaneous / Modified etc: 1.20%

Source: TSC 2004 c

Status of Tweed Shire Riparian Zones

Native vegetation in Tweed riparian areas has been heavily degraded and largely replaced with exotic species. This is mainly due to clearing, increased nutrient levels and modification of flow regimes in the waterways.

Remnant flora along the lower Tweed includes:

- Fringing open swamp-forest.
- Rainforest.
Open forest.
Shrub/heath lands.

Areas of fringing forest occur adjacent to Wommin Lake, Cobaki Broadwater and within Ukerebagh Nature Reserve.

The largest area of subtropical rainforest in the Tweed occurs on Stotts Island. Littoral rainforest occurs along the lower Tweed & is extremely fragmented, occurring in fragments of one to two hectares along the Fingal Peninsula, at Banora Point and Cobaki Broadwater.

Open forest occurs on land above tidal and most freshwater inundation. Only small areas of this forest remain - the red gum forest on Portion 224 and swamp messmate/paperbark tea tree forest fringing parts of Terranora and Cobaki Broadwater.

The most extensive and well preserved area of shrub and heathland occurs west of Coolangatta Airport on the margins of the Cobaki Broadwater.

Wetland vegetation occupies tidal inundated land and includes saltmarsh, mangroves and seagrass communities. These communities provide habitat for a wide variety of animals. They function as important nursery and feeding grounds for fish and crustaceans, most of which are of direct fisheries value.

Saltmarsh vegetation comprises shrubs, sedges and grasses growing on land at the upper limits of tidal inundation. Saltmarsh is most extensive on Ukerebagh Island, adjacent to Cobaki Creek and on Letitia Spit. Approximately 21ha of saltmarsh occurs on the lower Tweed estuary.

Five species of mangrove occur in the Tweed Estuary. Mangrove forests cover approximately 309ha. Mangrove vegetation ranges from tall forests to low shrublands. In terms of mangrove area, the Tweed River estuary is the eleventh largest mangrove estuary in N.S.W. Two species (Rhizophora stylosa, Bruguiera gymnorhiza) are at their southern most limits. Most mangrove vegetation along the lower Tweed River occurs on islands and around the shores of the broadwaters. Fringing mangroves on most riverbanks are sparse to absent.

Seagrass beds in the lower estuary cover approximately 67.4ha (1991 survey). One species (Zostera capricorni) is dominant with some small areas of Halophila ovalis. Major seagrass communities include; Kerosene Bay, Wommin Lake, Ukerebagh Passage, Chinderah Bay, Jack Evans Boat Harbour, Terranora Inlet & Terranora Broadwater. In 1976 only 40ha of seagrass was recorded within the Tweed Estuary.

Some exotic plants that exert a strong influence over Lower Tweed River Riparian communities include; Camphor Laurel, Coral Tree, Para Grass, Madiera Vine, Coastal Morning Glory (Mile a Minute), Barna Grass & Sirretro. For the upper Tweed River and its tributaries, exotics that exert a strong influence on riverine ecology include; Small Leaved Privet, Large Leaved Privet, Camphor Laurel, Cats Claw Vine, Madeira Vine, Barna Grass, Sirretro, Morning Glory, Para Grass.

The above-mentioned exotic species are but a few of the many invasive "weed" species that infest the waterways of the Tweed. (Periott, 1997)

<table>
<thead>
<tr>
<th>Indicator: Riparian Vegetation</th>
<th>Up to 03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of riverbanks with riparian vegetation (%)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Length of riverbanks revegetated / regenerated</td>
<td>4km</td>
<td>1km</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council Water Unit Note: In 04/05 over 18 kilometres of ongoing work on rivers, creeks, streams and gullies has been undertaken by Landcare volunteers.

Information Gap: The percentage of all riverbanks within the Tweed Shire with riparian vegetation has not been determined at this stage.

Comment: While knowing the percentage of riverbanks with riparian vegetation is an adopted
indicator of north coast council’s, it needs to be considered alongside the ‘quality’ of that vegetation. For example, a creek may have 100% riparian vegetation cover but if it’s dominated by invasive weeds then how useful is the indicator in reflecting the health of that sub-catchment?

**Recommendations for Further Action:**
1. Liaise with Catchment Management Authority to discuss the usefulness of this indicator and if necessary consider a suitable alternative.
2. Table a review of the regionally adopted sustainability indicators with the North Coast SoE Working Group.

---

**Status of Coastal Vegetation Communities**

Many of the coastal vegetation communities are poorly reserved and have suffered a disproportionate level of clearing for agriculture and urban development. Pressey and Griffith (1992) calculated that 87% of Tweeds coastal lowland vegetation had declined from its original extent. A study of land clearing in the north-eastern section of the shire by Ecograph (1999) indicated that the majority of clearing in the last 40 years has been attributed to urban development. Although there was substantial regrowth of vegetation in rural areas between the 1960's and 1996 much of this regrowth appears to be the exotic weed tree Camphor Laurel. Camphor Laurel was also found to be dominant or co-dominant in over 13% of all bushland surveyed for its presence in Tweed Shire in 1996.

**PRESSURE**

**Summary of Key Threatening Processes**

Key threatening processes on native fauna and flora include:

- Clearing of native vegetation and the associated habitat fragmentation.
- Invasive environmental weeds.
- Altered fire patterns.
- Pest animals (e.g. rabbits, foxes, cane toads, pigs).
- Global warming / climate change
- Alterations to natural flow regimes of rivers, streams, floodplains and wetlands.


**Indicators of Environmental Pressures**

**Clearing of Native Vegetation**

Native vegetation clearing is at the most dramatic end of the scale (Buchanan 1989) for pressures on biodiversity. The clearing of vegetation has a direct effect of reducing and fragmenting wildlife habitats for flora and fauna, affecting the long-term viability of endemic populations. Clearing of native vegetation can also contribute to soil erosion, increased sedimentation of water bodies and provide an opportunity for weed infestation.

<table>
<thead>
<tr>
<th>Indicator: Land Clearing</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (Ha) of rural bushland cleared</td>
<td>N/A</td>
</tr>
<tr>
<td>Area (Ha) of coastal vegetation cleared</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Indicator: Threatened Species* 05/06

| Number of threatened animals | 173 |
| Number of threatened plants  | 215 |
| Number of threatened ecological communities | 13 |


Indicator: Number of Weed Species 04/05 05/06

| Total Number Of Declared Noxious Weeds In The Far North Coast County Council Area | 48 103 |
| Number Of Identified Weed ‘Hotspots’ In The Shire | See below See below |

Source: 04/05 Far North Coast Weeds 05/06 NSW DPI * For a full description of each noxious weed and its control category listing visit: www.dpi.nsw.gov.au

Weed Hotspots

Groundsel Bush: widespread over the whole Tweed as light scattered to isolated plants. A core infestation of about 1,000 ha at Mebbin Springs, Kunghur, and a core infestation on the wetland north of Bilambil.

Kudzu: is a new incursion in the area around Limpinwood. Exact location currently unknown. Needs serious watching.

Tecoma stands (Yellow Bells, Tecoma, Yellow Elder): spreading rapidly around the shire east of a line parallel to the coast, running through Mount Warning. Privet: particularly Broad-Leaf, spreading throughout the Shire. Particularly bad in the Tyalgum area.

Cuphea carcinogenesis: spreading through neglected grazing land around Crystal Creek, Clothiers Creek, Cudgen, Pottsville, Mooball.

Giant Parramatta Grass: significant problem at Pumpenbil, Clothiers Creek, and along Wooyung Rd and Coast Rd south of Pottsville. Potential problem at Mebbin Springs.

Giant Rat's Tail Grass: a problem in the Pumpenbil area.

Salvinia: has been a significant problem on the south arm of the Tweed River and in Clarrie Hall Dam. Currently under control. Isolated infestations throughout the Shire at Chillingham, Crystal Creek and Eungella.

Madeira Vine: a major concern upstream of Murwillumbah, particularly along stream lines south arm of river up through Uki. Also Stokers Siding and many other areas.

Greenleaf Desmodium, Silver Leaf Desmodium, Siratro: significant pasture escapees. Moving rapidly into native vegetation, particularly around southern end of Shire, towards Kyogle. Water Lettuce: was detected at Pumpenbil (Fowlers Creek) 18 months ago. Under control. Bitou Bush: is a significant problem along coastal dunal system.

**Cabomba and Hygrophila costata** (Glush Weed): are spreading in Billinudgel Creek below Billinudgel. Glush Weed has the potential to severely alter stream flora and fauna, damaging stream health.

**Ipomea spp**: spreading along streams and roadsides, particularly along the eastern half of the Shire. Bad along Tweed River from Uki to Chinderah and Crystal Ck to Tumbulgum.

**Umbrella Tree**: spreading in many areas of Tweed, in Murwillumbah township and adjoining rainforest areas. Basically, wherever they have been planted.

**Golden Rain Tree**: another emerging problem, mainly near urban areas.

Of all the exotic species occurring within the shire, *Camphor Laurel* is the most widespread, growing in all areas where natural vegetation has been modified, particularly in the Tweed-McPherson Ranges and lower valley slopes.

(Far North Coast Weeds, 2003).

<table>
<thead>
<tr>
<th>Indicator: Fires</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of public land burnt (hectares)</td>
<td>1242</td>
<td>1455</td>
<td>1905</td>
<td>1310</td>
</tr>
<tr>
<td>Total number of Rural Fire Services incidents</td>
<td>550</td>
<td>445</td>
<td>579</td>
<td>436</td>
</tr>
</tbody>
</table>

Source: Rural Fire Services

**Pest Animals**

Pest animal indicators have not been identified for the Tweed Shire at this stage. To find out more about pest animals in Australia visit: [www.nationalparks.nsw.gov.au/npws.nsf/Content/Pests+and+other+threats](http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Pests+and+other+threats)

**Global Warming**

Refer to the [Atmosphere](#) section of this report for indicators of global warming pressures.

**Alterations to Natural Flow Regimes**

Indicators that measure the environmental pressures of altered flow regimes have not been identified at this stage.

**Recommendation for Further Action**: Initiate a process to improve the ‘environmental pressure’ indicators for bushland and biodiversity management.

**RESPONSE**

**Management Documents**

Management documents relating to Bushland and Biodiversity Management include:

- Tweed Coastline Management Plan.
- Tweed Riparian Management Plans.
- Tweed Coast Littoral Rainforest Management Plan.
- Tweed Coast Bitou Bush Management Strategy.
- Tweed Coast Koala Atlas, 1996.
- State Environmental Planning Policy No. 14 Wetlands.
- State Environmental Planning Policy No. 26 Littoral Rainforest.
Management Actions

To help address the ecological impacts of land clearing and habitat fragmentation, Council undertook the following in 2005/2006:

Allocated resources for the implementation of Vegetation Management Strategy.
Commenced integration of statutory aspects of the Vegetation Management Strategy into the revised Local Environmental Plan consistent with the NSW State Government standard template.
Commenced planning for additional aspects of the Vegetation Management Strategy (e.g. on ground works, education etc).

To help address the ecological impacts of invasive environmental weeds, Council undertook the following in 2005/2006:

Ongoing implementation of the Tweed Coast Bitou Bush Management Strategy.
Undertaken weed control in association with riparian restoration projects at a number of locations throughout the Shire.
Implemented a major sub-catchment rehabilitation project in Byrrill Creek, targeting the removal of invasive weeds from high conservation value riparian rainforest.
Ongoing support for local LandCare and DuneCare groups to help control weeds.
Continued requirement for new developments to implement weed control and bushland management as part of their condition of consent.
Established a residential green-waste collection service. Refer to the Waste Management section for more detail.

These actions have delivered the following outcomes:

A reduction in the spread of Bitou Bush along the Tweed Coastline.
Improved ecological functions of high conservation value riparian vegetation.
The green waste collection service has delivered a range of environmental improvements including reduced contamination of recycling and reduced green waste being deposited into the landfill from household rubbish bins. At this stage it is not known how well this initiative has helped to address the ecological impacts of illegal garden waste dumping.

To help address the ecological impacts of invasive environmental weeds, Far North Coast County Council undertook the following in 2005/2006:

Integrated management of *Salvinia molesta* at Vintage lakes utilising biological control (Salvinia weevil), mechanical removal and herbicide/chemical control methods.
Non chemical management of the *Salvinia* infestation at Clarrrie Hall Dam through the use of containment booms, mechanical removal and biological control.
Control of Bitou Bush on all land tenures in Tweed Shire to create the northern containment zone in NSW to prevent spread into QLD as a action of the successful Tweed Shire Bitou Bush Control Strategy.
Discovery of the Class 1 aquatic weed Water Lettuce (*Pistia stratiotes*) on private properties at Piggabeen and subsequent development of property management plans with landholders to control and monitor the infestation for reinfestation.
Control of Broad Leaf Pepper Trees in South and West Tweed areas, with aim for eradication in Tweed Shire by 2009.
To help address the ecological impacts of pest animals, Council undertook the following in 2005/2006:

Pandanus plant hopper control: Pandanus dieback, caused by the flatid insect Jamella Australiae, was identified in the Tweed in 2004. Extensive tree injection to affected trees and buffer zones with the systemic insecticide imidacloprid has occurred since that time. A total of 1232 Pandanus trees have been treated throughout the Shire.

To help address the ecological impacts of altered fire patterns, Council undertook the following in 2005/2006:

Initiated a process to identify appropriate fire regimes for bushland areas in the shire.

The following actions were undertaken by the Rural Fire Services in 2005/2006 to help address the ecological impacts associated with altered fire patterns:

Ongoing community education to make people aware of their responsibilities regarding burning off for bushfire hazard reduction.

Ongoing requirement for ‘Hazard Certificates’ for private fire hazard reduction works.

These actions have delivered the following outcomes:

Significant reduction in the number of ignitions resulting from private bushfire hazard reduction works.

To help address the ecological impacts of the enhanced greenhouse effect, Council undertook the following in 2005/2006:

Refer to the Atmosphere section of this report.

To help address the ecological impacts of altered flow regimes, Council undertook the following in 2005/2006:

Refer to Barriers to Fish Passage in the Waterway Health section of this report.

Participated in the installation of 10 new tidal floodgates. To date 18 floodgates on the coastal floodplain have been altered to improve tidal flow in cane drains. This process significantly improves the water quality of cane drains and associated waterways.

Related Issues

Human Settlement
Soil Landscape
Waterway Health
Community Participation
Council Operations

Recommendation for Further Action: Develop a wholistic framework for natural resource management that includes ecological assessment, planning assessment, soil and water resources, management and rehabilitation works, socio-economic and cultural assessment, monitoring and evaluation.

SOIL LANDSCAPE

Healthy soil is essential for the provision of services by businesses within the Shire, particularly those operating horticultural and agricultural operations. This section of the report describes the state of the Shire’s soil landscape, and outlines some of the initiatives being undertaken by Council to protect and restore the soil landscape in the Shire.
CONDITION

Due to their basaltic origin, many of the soils in the Tweed Shire are slightly acidic. Much of the floodplain areas have Potential and Actual Acid Sulfate Soils close to the surface. (TSC 2000 b)


Detailed soil maps for the Tweed region are available from the NSW Department of Natural Resources.

PRESSURE

Summary of Key Threatening Processes

Key threatening processes on the soil landscape include:

- Acid sulfate soils, which in turn leads to:
  - Land degradation and reduced productivity in agricultural areas.
  - Water quality degradation and the associated impacts on aquatic life.
- Contaminated land.
- Erosion and sedimentation associated with agricultural and construction activities.
- Changing land-use patterns.

Indicators of Environmental Pressures

<table>
<thead>
<tr>
<th>Indicator: Acid Sulfate Soils</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of land with a high risk (acid sulfate soil) classification</td>
<td>13,714Ha</td>
<td>13,714Ha</td>
<td>13,714Ha</td>
<td>13,714Ha</td>
</tr>
<tr>
<td>Area of land with a low risk (acid sulfate soil) classification</td>
<td>6,118Ha</td>
<td>6,118Ha</td>
<td>6,118Ha</td>
<td>6,118Ha</td>
</tr>
<tr>
<td>Percentage of the shire with a high risk (acid sulfate soil classification)</td>
<td>10.5%</td>
<td>10.5%</td>
<td>10.5%</td>
<td>10.5%</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council

Note: While the area of land with high / medium / low risk classifications for acid sulfate soils has remained static over a number of years, increases in the number of construction works on the coastal floodplain has increased the potential for environmental impacts due to acid sulfate soils.

<table>
<thead>
<tr>
<th>Indicator: Acid Sulfate Soil Hotspots</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cudgen Creek</td>
<td>799 Ha</td>
</tr>
<tr>
<td>Dulguigan</td>
<td>681 Ha</td>
</tr>
<tr>
<td>McLeods Creek – Main Trust Canal</td>
<td>2137 Ha</td>
</tr>
</tbody>
</table>

Source: Department of Natural Resources

<table>
<thead>
<tr>
<th>Indicator: Additional High Risk Acid Sulfate Soil Areas</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Murwillumbah – Blacks Drain</td>
<td>--</td>
</tr>
<tr>
<td>Murwillumbah – Lavender Swamp</td>
<td>--</td>
</tr>
<tr>
<td>Tygalgah</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council
**RESPONSE**

**Management Documents**

Management documents relating to the soil landscape include:


**Management Actions**

Council undertook the following actions in 2005/2006 to address environmental pressures associated with acid sulfate soils:

- Ongoing requirement for development approval for any works which may result in the disturbance of potential acid sulfate soils.
- Ongoing implementation of the drain in-filling program in caneland across the shire. To date, works have occurred at Eviron, Bray Park, Christies Creek, Murwillumbah, Kynnumboon, Tygalgah and Chinderah.
- Ongoing participation in cane land levelling projects throughout the shire. Laser levelling is considered good industry practice with the main benefit being the reduction in the need for drains due to the improved runoff. This process decreases the export of acid sulfate soil runoff.
- Participated in a greenhouse gas monitoring study associated with acid sulfate soils. For more information refer to the Atmosphere section of this report.
- Participated in the installation of 10 new tidal floodgates. To date 18 floodgates on the coastal floodplain have been altered to improve tidal flow in cane drains. This process significantly improves the water quality of cane drains and associated waterways.

Council undertook the following actions in 2005/2006 to address environmental pressures associated with contaminated land:

- Ongoing requirement for pre-demolition testing of the soil beneath concrete slabs to identify if soil contamination from insecticides (termite control) is present.
- Continued to provide contaminated land reports upon request. Contaminated land reports involve a comprehensive search of council’s records to identify if potentially contaminating activities have occurred on a particular parcel of land.

Council undertook the following actions in 2005/2006 to address pressures on the soil landscape that are associated with changing land-use patterns:

- Ongoing participation in the Farmland Protection Project being coordinated by Planning NSW.
Council undertook the following actions in 2005/2006 to address environmental pressures associated with soil erosion:

- Issued two penalty infringement notices for erosion and sediment control breaches at construction sites.

Additional actions undertaken by other agencies to address environmental pressures associated with the soil landscape include:

- The adoption of ‘best practice guidelines' for cane farming. This initiative has been implemented by Department of Natural Resources and the NSW Sugar Milling Cooperative.

Related Issues

- Built Environment
- Waterway Health
- Bushland and Biodiversity
- Community Participation
- Atmosphere
CONDITION

Long Term Goals
To reduce the shires per capita greenhouse gas emissions by at least 20% by 2015 (based on 1996 emission levels).
To protect and maintain the air quality of the shire.

2006 - 2009 Targets
Ongoing implementation of the Tweed Community Greenhouse Gas Reduction Local Action Plan
Ongoing promotion of the ‘big five’ for household greenhouse gas abatement, namely GreenPower electricity, three-star showerheads, energy smart lights, solar hot water systems and alternative modes of transport.

Climate of the Tweed
The Tweed Shire experiences a humid, subtropical climate with the regional climate predominantly controlled by the seasonal migration of the trade winds to the north and the anticyclone belt to the south. From approximately November to April the climate is generally warm and humid with south-easterly trade winds resulting from the anticyclone belt lying well to the south. The anticyclone belt migrates north during April and by July is generally covering the region, which results in a decrease in humidity and rainfall. (TSC 2000 b).

PRESSURE

Key Threatening Processes
Pressures being placed upon the air and / or climate of the Tweed include (but are not limited too):
Rising household energy consumption and the use of non-renewable energy sources which leads to:
o Increased greenhouse gas generation.
o Increased contribution towards global warming.
Increases in vehicular traffic which in turn leads to:
o Increased greenhouse gas generation
o Increased emissions of particulates (i.e. smog).
Air emissions from industrial sources.
Air emissions from cane fires.

**Indicators of Environmental Pressures**

**Indicator:** Greenhouse Gas Generation  
<table>
<thead>
<tr>
<th>Year</th>
<th>Tonnes of greenhouse gases (CO₂ equivalent) emitted in the shire</th>
</tr>
</thead>
<tbody>
<tr>
<td>95/96</td>
<td>556,764</td>
</tr>
<tr>
<td>03/04</td>
<td>768,161</td>
</tr>
</tbody>
</table>

*Information sourced from the Tweed’s greenhouse gas inventory conducted through the CCP Campaign.*

**Indicator:** Total Community CO₂ Emissions in 1996 and 2010 (Forecast Year)

Note: Between 1996 and 2004, the shire's greenhouse gas emissions have risen by approximately 38%. These emissions stem primarily from the burning of fossil fuels to power our cars, homes and businesses.

**Indicator:** Renewable Energy Use

<table>
<thead>
<tr>
<th>Year</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households in the shire choosing Green Power as their electricity supply option</td>
<td>153</td>
<td>856</td>
<td>1551</td>
</tr>
<tr>
<td>Number of Council facilities choosing Green Power as their electricity supply option</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Country Energy & Tweed Shire Council

**Indicator:** Licensed Discharges - Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of EPA licensed discharges</td>
<td>30</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: NSW EPA. This figure is a combined total for both waterway and atmospheric discharges.

Note: A full listing of all premises 'licensed to pollute' in the Tweed Shire Council area can be found at [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au).
<table>
<thead>
<tr>
<th>Indicator: Air Quality Complaints</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of air quality complaints</td>
<td>37</td>
<td>29</td>
<td>19</td>
<td>61</td>
</tr>
</tbody>
</table>

Source: Tweed Shire Council

<table>
<thead>
<tr>
<th>Indicator: Cane Fires</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of cane burnt before harvest (approx)</td>
<td>N/A</td>
<td>90%</td>
<td>93.4%</td>
<td>83%</td>
</tr>
</tbody>
</table>

Source: NSW Sugar Milling Cooperative

**Transport Indicators**: Refer to Transport section of this report.

**RESPONSE**

**Management Documents**

Management plans relating to the atmosphere include:


To view this document visit: [www.tweed.nsw.gov.au](http://www.tweed.nsw.gov.au)

**Recommendation for Further Action**: Develop an *Environmental Management Policy* that includes energy efficiency goals and targets for council operations.

**Management Actions**

**Cities for Climate Protection Program**

In order to work toward a sustainable future our present consumption of non-renewable energy sources needs to be carefully managed. Consumption rates need to be reduced through energy efficiency measures and alternatives to non-renewable energy and resources need to be adopted. Tweed Shire Council aims to facilitate the achievement of these objectives through the Cities for Climate Protection (CCP™) Program, an international initiative that provides funding and technical assistance to local governments to promote the reduction of greenhouse gas emissions in their area. In 2005/2006 the following initiatives were implemented to reduce greenhouse gas emissions in the shire:

In August 2005 Council commenced a trial of an electric / petrol hybrid car within the Council passenger vehicle fleet. This trial is still underway.

**Big Three For Green Living Case Study:**

A year-long case study that quantified the water, energy, greenhouse gas savings and lifestyle benefits of combining Green Power electricity, three-star rated showerheads and compact fluorescent light globes (the big three for green living) in the home was completed in November 2005.

**Big Three For Green Living Giveaway:**

2000 water and energy saving kits that contained 1 x three star shower, 5 x compact fluorescent light globes and 1 x greenpower application form were given away to local residents in November 2005.
The methane flaring facility at the Stotts Creek Landfill was converted to a methane co-generation facility in May 2006.

Began a process to prepare Energy Savings Action Plans for ten of Council’s sites and facilities. Refer to Council Operations section for more detail.

Co-hosting a research project by the National Australian University to compare greenhouse gas emissions from acid sulfate soils and non-acid sulfate soils in cane paddocks.

<table>
<thead>
<tr>
<th>Indicator: Greenhouse Gas Abatement</th>
<th>‘00 to ’04</th>
<th>04/05</th>
<th>05/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonnes of greenhouse gases not emitted as a result of Council initiatives (CO₂ equivalent)</td>
<td>20,859</td>
<td>8,111</td>
<td>12,080</td>
</tr>
</tbody>
</table>

Information sourced from the Tweed’s greenhouse gas inventory conducted through the CCP Campaign.

Cane Fires

A cogeneration facility to produce renewable electricity from bagasse, cane leaf, camphor laurel and sawmill residues is in the final stages of construction at the Condong Sugar Mill. The initiative is a joint venture between the N.S.W. Sugar Milling Cooperative and Delta Electricity and will mean a reduction and ultimately an elimination of cane fires in the Tweed Valley. In addition to the local air quality benefits, the facility will generate more than half the annual power requirements of the Tweed. The project will result in the reduction of greenhouse gas emissions associated with the consumption of coal-powered electricity by approximately 180,000 tonnes each year. For further information contact Delta Electricity on 1800 817 711.

Related Issues

- Built Environment
- Waste Management
- Water Supply
- Transport
- Community Participation
- Bushland and Biodiversity
- Council Operations
Role of Local Government in Environmental Management

As the level of governance closest to the people, Local Government plays a vital role in environmental management through its:

- Activities such as waste collection, disposal and recycling, development control, sewage treatment, drainage management and community education.
- Control over planning and development processes.
- Involvement in regional programs such as Integrated Catchment Management.

(DLG, 1999).

STRATEGIC MANAGEMENT

Integrated Ecologically Sustainable Development (ESD)

Council must protect and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development (Councils charter s.8 Local Government Act 1993 NSW). Council must have regard to economic, social and environmental considerations in the decision-making process to meet the ecologically sustainable development principles of its charter.

Council must be committed to creating a meaningful planning framework with a strong strategic component and address the principles of ecological sustainability early in the planning process.

**Long Term Goal:**
1. Incorporate long-term ESD goals and short-term ESD targets into the statutory planning framework.

**2007–10 Targets:**
1. Incorporate ESD goals and targets into 2007-10 Management Plan (and successive management plans thereafter).
2. Set responsibilities for the achievement of each ESD target as part of the 2007-10 Management Plan (and successive management plans thereafter).
3. Initiate a monitoring and evaluation framework to determine how well the short-term ESD targets are helping to achieve the long-term ESD goals.

Integrated Planning Framework

Council must be accountable and transparent in all areas of business and inform the community about its activities. Council must evaluate economic, social and environmental factors during planning and have regard to the long-term cumulative effects in its decision-making process.
Council must:

1. Advance the competitiveness of local businesses through flexible and adaptive infrastructure and services planning.
2. Respond to new demands and take greater responsibly in addressing social issues.
3. Respond to the sustained protection and conservation of the environment.

(May, 2001)

Council must commit to an integrated and coordinated planning framework with clearly planned links in terms of actions and outcomes.

Long Term Goal:
1. Develop a cooperative and integrated approach to social, environmental and economic planning / reporting.

2007-10 Targets:
1. Develop a set of standard planning and reporting themes for social, environmental and economic planning and reporting.

Integrated Reporting and Monitoring

Council under its charter must keep the community and the State government informed about its activities. Council must
Report annually on its performance in meeting it’s three-yearly objectives

- Detail results of access and equity initiatives in meeting known community social needs
- Monitor the state and condition of the environment.

Council must commit to clearly and explicitly linking business planned actions and activities (targets) to strategic outcomes (goals).

Long Term Goal:
1. Integrate Triple Bottom Line (TBL) reporting into the statutory reporting framework.

2007-10 Targets:
1. Achieve Integrated Planning Framework and Integrated ESD targets (see above).
2. Incorporate TBL reporting into the 2007-08 quarterly report format.
3. Incorporate TBL reporting into 2007 Annual Report format.

OPERATIONAL MANAGEMENT

Operational Management System

In 2002/2003 Council began the process of developing an Environmental Management System (EMS) for its operational activities. Complying with the principles of ISO 14001, the purpose of the EMS is to improve the environmental outcomes associated with Council’s operational activities and to lead by example through the application of good environmental practices.

While it is acknowledged that a significant amount of work remains to be done in relation to the ongoing implementation of the OMS, council’s commitment to continuous
Improvement in its operations has created a solid foundation on which the OMS is being constructed.

In 2005/2006 Tweed Shire Council undertook the following to improve environmental outcomes via the Operational Management System:

- Continued to inform new staff of their environmental management responsibilities via the OMS induction process.
- Biodiversity conservation: Began a process to reduce the environmental impact associated with roadside vegetation management.
- Waste management: Adopted an Office Waste Minimisation Strategy, see Green Procurement below for more information.
- Water efficiency: Continued a trial of waterless urinals in council’s main administration building. The aim of this trial is to determine the most suitable waterless urinal technology for use in the shires public facilities.
- Energy efficiency: Refer to Energy Savings Action Plans below.

Green Procurement

Green Procurement is a component of the Operational Management System. Green procurement refers to the purchase of goods or services that have a lesser or reduced affect on human health and the environment when compared with competing products or services that serve the same purpose. Such products or services may include, but are not limited to those which contain recycled content, minimize waste, conserve energy or water, and reduce the amount of toxics disposed or consumed.

Council aims to base procurement decisions on the principle of ‘value of money’ over the life cycle of products rather than the ‘lowest cost’ and gives preference to the purchase of environmentally friendly products where they are performance competitive and cost competitive with the existing product purchase.

In order to balance environmental considerations within ‘value for money’, the procurement process is also based on the concept of cost neutrality. In other words, substituting the use of products with lower environmental impact costs where the overall effect on council’s business is cost neutral or favourable, for example:

- Where the product with lower environmental impact costs the same as, or less than the original.
- Where the lower impact product costs more than the original but results in savings over time which offset its greater cost (often the case for energy saving services such as low energy light bulbs or more efficient refrigerators)
- Where the lower impact product costs more, but the cost can be offset from savings made elsewhere within the business unit as a result of the usage of this product.
- Where intangible benefits, such as corporate profile, are perceived as having value equivalent to the extra cost of the product.

In 2005/2006 Tweed Shire Council undertook the following to improve green procurement practices:

- Adopted an Office Waste Minimisation Strategy that includes long-term goals and short-term targets for the use of recycled office paper, remanufactured toner cartridges and energy efficient office equipment.
- Increased the use of remanufactured toner cartridges in accordance with the Office Waste Minimisation Strategy.
Increased the use of 100% post consumer recycled envelopes in accordance with the *Office Waste Minimisation Strategy*.

**Recommendation for Further Action:** Develop a ‘green procurement checklist’ for incorporation into Council’s *Procurement Policy*.

**Energy Savings Action Plans**

The NSW Department of Energy, Utilities and Sustainability (DEUS) is requiring local government areas in NSW with a population of >50,000 to prepare Energy Savings Action Plans for their major sites and facilities. The initiative is aiming to reduce the amount of greenhouse gas emissions from electricity generation in NSW by establishing an energy saving culture within participating organisations.

Tweed Shire Council has welcomed the ESAP requirement for it supports and enhances its commitment to the Cities for Climate Protection Program, an international initiative that reduces greenhouse gas generation at the local government level. For more detail on the ESAP requirements visit: [www.deus.nsw.gov.au](http://www.deus.nsw.gov.au). For more information on the Cities for Climate Protection Program visit www.iclei.org or www.tweed.nsw.gov.au

**Contracts and Tenders**

Council regularly seeks tenders for services that include:

- Civil works design and project management.
- Product supply (as a preferred supplier)
- Site works and site restoration
- Manufacture, supply and delivery of specific goods and services.

Tweed Shire Council has sought to improve the environmental outcomes associated with contracts and tenders through the implementation of the following:

- General environmental protection controls included in tender specifications.
- The submission of Environmental Management Plans is generally required for works in or adjacent to environmentally sensitive areas.
- Details of the development application conditions are included in the tender specifications to allow tenderers to familiarise themselves with the conditions of consent.
- Tender evaluations consider the environmental ‘track record’ of the company.

**Recommendation for Further Action:** Conduct a thorough review of tender specifications, contract conditions and compliance procedures to identify areas of improvement for environmental management outcomes.

**Project Management Plans**

A Project Management Plan (PMP) is a collated document held by the project overseer containing all the information relevant to the site and activity to be undertaken. This includes:

- Planning assessment documents and consent/approval conditions.
Relevant management plans including environmental management requirements.
Relevant Standard Operating Procedures and Work Method Statements.

In 2005/2006 Tweed Shire Council sought to improve the environmental outcomes of its construction projects in the following ways:

Inclusion of a PMP summary page outlining environmental constraints and actions required in order to avoid / minimise environmental harm.

Inclusion of all relevant management plans, permits and licenses in the PMP.

Inclusion of compensatory habitat packages funded by the project.

Development of a training program for engineering field staff in erosion and sediment control, acid sulfate soils, habitat analysis and compensation. Commencement of this training is planned in 2007.

Design Unit environmental staff have broadened their scope from simply seeking planning approvals and recommending best practice methodology for Council Works projects to fulfilling an environmental auditing role for large construction and maintenance projects. In 2005/06 these included:

- Piggabeen Road deviation – erosion and sediment control monitoring and improvements – wetland compensation package management.
- Kingscliff (new) Wastewater Treatment Plant – erosion and sediment control – dust, noise stockpiling issues.
- Western Drainage Scheme – water quality analysis, management and improvement – noxious and environmental weed control management and improvement.
- Tugun Bypass Environmental Review Group – participation and feedback.
- Quarry operations (in general) – improvements to monitoring of water and air quality through EPA licenses.

Recommendations for Further Action:

Develop a direct link between staff formulating components of PMP’s and the on-ground staff who implement them.

Improve liaison, reporting and feedback mechanisms to ensure environmental recommendations are implemented.

Related Issues

Council Operations - Operational Management System
Human Settlement (all topics)
Catchment Management
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