GREAT LAKES COUNCIL

State of the Environment Report

2008/09 Comprehensive State of the Environment Report

Great Lakes COUNCIL

Great Lakes Council Comprehensive State of the Environment Report 2009

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1 Executive Summary

Located on the lower Mid North Coast of New South Wales the Great Lakes Local Government Area (LGA) of 3,373 km^2 in size supports a rapidly expanding population of approximately 33,000 residents. Containing a unique environment of immense natural, social and economic value the region relies heavily on the health of its natural surroundings and landscapes.

However the integrity of our natural environment is threatened by numerous human impacts and without adequate protection we risk losing the uniqueness that makes this region a great place to live, work and play. The growing and widespread recognition during recent years, of the potential consequences of global warming clearly demonstrates the link between the integrity of the environment and our economy and lifestyle.

Continuation of damaging land uses combined with significant growth in residential and visitor populations, as well as associated infrastructure provisions, probably remain the greatest threat to the quality of our environment. As such water deterioration, land degradation and loss of biodiversity are amongst the major environmental issues facing the region. Appropriate management of these threats is required in order to avoid a continuing decline in the health of the local environment. Deterioration of the environment will inevitably impact on our economy, our way of life and the general aesthetics of the LGA.

This document, Great Lakes Council's 2008/09 comprehensive State of the Environment (SoE) Report, seeks to monitor the health of the region's environment. To achieve this Council has established set indicators to assist with determining changes and trends within the environment. In line with current legislation these indicators fall under several themes, Water, Biodiversity, Waste and Toxic Hazards, Land, Air, Noise and Heritage. Council has also identified the importance of community involvement in the development of this document and has utilised community comment to assist knowledge gathering and to help set priorities for action. The SoE reporting framework is a valuable communication tool and this report seeks to outline to the public the actions and responses of Council with respect to the environment.

This comprehensive State of the Environment report forms the fifth of five data collection periods (note usually there are only four years of data collection for the Comprehensive report but the timing of local government elections has meant that the next Comprehensive report is due in 2009 instead of 2008).

Table 1.1: Summary of issues, pressures and responses associated with environmental indicators

Indicator	Issues and Pressures	Council's response	Community response- What you can do
Water			
Water Quality	• Deterioration of water quality impacts on environmental and human health as well as our economy and society • Water pollution occurs through point-source or diffuse-source pollutants entering stormwater systems and water ways. • Removal/disturbance of vegetation, increased use of impervious surfaces (e.g. roads and carparks), application of chemicals (e.g. fertilisers), disturbance of acid soils and disposal of treated human wastes are all activities that result in increased pollutants in our waterways	• Wallis Lake Catchment Management Plan • Wallis Lake, Smiths Lake and Port Stephens/ Myall Lakes Estuary Management Plans • Water Quality Improvement Plan for Wallis, Smiths & Myall Lakes - Coastal Catchments Initiative • Healthy Lakes Program • Darawakh Frogalla Wetlands Management Plan • WaterWatch community program • Member of Water Quality Partnership • Structural Solutions (e.g. Gross Pollutant Traps) • Development Assessment and Strategic Planning • Sustainable Farming programs	• Avoid putting any substance down stormwater drains • Wash cars on lawn • Limit chemical & fertiliser use in the garden/farm • Pick up after your pets • Dispose of waste and litter in bins • Sweep leaves and debris away from stormwater drains and dispose of or mulch • Become involved in Council's WaterWatch program • Plant native plants to help stabilize soil and filter pollutants • Prevent stock from entering waterways • Undertake sustainable grazing including managing groundwater • Protect and enhance riparian vegetation and vegetation on steep slopes
Water Usage	• Increasing population can place greater pressure on limited water resources • Damming/ diverting of rivers can have detrimental effects on the downstream environment and therefore, needs to be limited • New technologies have allowed the more efficient use of water and their use can reduce some of the pressure on water resources	• MidCoast Water is undertaking a Sustainable Water Cycle Management project, investigating options for improving water supply and educating the community through the WaterWise program	• Fix leaking taps • Install a rainwater tank • Invest in water efficient showerheads, washing machine and dishwasher • Take short showers instead of baths • Plant drought tolerant natives
Algae Blooms	• Algae blooms occur naturally but are often the result of human practices • Algae blooms can occur due to excessive nutrients being released into the water through fertiliser, detergents and other chemical use and from the alteration of water flows • Some algae blooms are dangerous to animal and human health, such as blue-green algae	• See 'Water Quality' section above	• See 'Water Quality' section above
Fish Kills	• Reduction in water quality or changes	• See 'Water Quality' section	• See 'Water Quality' section

Indicator	Issues and Pressures	Council's response	Community response- What you can do
	in water temperature, oxygen levels and pH can cause fish kills • Many human activities influence water quality as noted above	above	above
Stormwater Pollution	• Stormwater pollution is any pollution that is collected by rainwater and washes down natural and man made drains into our oceans and waterways. This includes loose sediment, litter, leaves and chemicals • Gross pollutant traps can trap large pollutants and stop them from reaching and polluting waterways. However, these structures only work for the small areas they can service and they do not remove chemicals (although constructed wetlands can reduce nutrients/chemicals)	• See 'Water Quality' section above	• See 'Water Quality' section above
Fish Passage Barriers	• Obstacles such as causeways, road crossings, dams, weirs and culverts can obstruct the natural migration and breeding of fish, thus reducing their numbers. • Where appropriate, structures that obstruct fish need to be removed or modified (e.g. with Fish Ways)	• The NSW Department of Primary Industries is undertaking a project to identify and progressively remove or modify fish passage barriers.	• Seek approval from DPI (Fisheries) before putting in any structure in any water body.
	Biodiversity		
Native Vegetation	• A growing population and associated development has meant that vegetated areas are being reduced or fragmented by residential development or clearing for agriculture. • Native vegetation provides us with a number of services and resources (cleaner air and water, healthier more productive soil, wildlife habitat, shade and atmospheric regulation, carbon storage etc.) and its value is often underestimated	• Great Lakes Council is currently preparing a Vegetation Strategy to identify, prioritise, manage and protect native vegetation within the LGA • Tree Preservation Order • Revegetation works	• Plant native trees and plants wherever possible • Retain native trees, especially older and large habitat trees • Place a portion of your land under a conservation agreement • Work with neighbouring landowners to link up fragmented vegetation corridors
Conserved Land	• Public and private conservation provides for the preservation of biodiversity and native vegetation	• There is a need to establish a Great Lakes Protected Area Network	• Place a portion of your land under a conservation agreement
Corridors	• Vegetated corridors have been identified as a way to link up fragmented vegetation and to aid the movement of fauna.	• There is a need to identify, protect and develop corridors as part of the Vegetation Strategy	• Work with neighbouring landowners, Council and National Parks to link up fragmented vegetation corridors by strategically planting native trees on your land

Indicator	Issues and Pressures	Council's response	Community response- What you can do
Noxious and Environmental Weeds	• Weed invasion displaces native plants and animals and costs millions of dollars to control. • Most noxious and environmental weeds are introduced plants that have escaped from people's gardens or fish ponds	• Council's Noxious Weeds Officer inspects and controls weeds and educates the community as resources allow • Member of Mid Coast Weed Advisory Committee • Support of Bushcare and Coastcare groups	• Remove and suppress noxious and environmental weeds on your land • Join a Bushcare or Coastcare group to help remove weeds from our parks, reserves and foreshore areas • Try to use locally native plants rather than exotics for your garden
Threatened Species	• The number of threatened species, populations and endangered ecological communities is increasing as a direct result of human modification of natural areas (i.e. vegetation removal and degradation).	• Council is a partner in implementing actions of Recovery Plans for threatened species • Facilitation and support of Koala Working Group (Hawks Nest Tea Gardens Endangered Koala population) • Development Assessment/ Strategic Planning	• Plant native trees • Remove and suppress noxious and environmental weeds • Report sightings of endangered species to Council • Join a Bushcare or Coastcare group • Work with neighbouring landowners, Council and National Parks to link up fragmented vegetation corridors by strategically planting native trees on your land • Drive carefully in vegetated areas • Retain native trees, especially older and large habitat trees
Waste & Toxic Hazards			
Waste	• Nationally, our increasing population and material wealth/ disposable lifestyle has resulted in an increase in waste produced • Ideally waste should be seen as a resource and can be reused, recycled or reduced • Reducing waste helps current landfill sites last longer (thus reducing the need to source further waste fill areas)	• Introduction of the 3 bin system (rubbish, recycling, greenwaste) to improve separation of waste and recycling • Waste education program • Active member of MidWaste • Development of Waste Strategy	• Avoid purchasing products with excess packaging • Buy in bulk • Use calico bags instead of plastic shopping bags • Recycle plastics, cans, cartons, paper and cardboard • Purchase items with recycled content (eg recycled paper) • Reuse items, buy second hand goods or borrow items where possible • Compost greenwaste or place food scraps in wormfarm
Sewage Treatment & Disposal	• Increasing population means increasing amounts of sewage to treat and dispose • Harder to regulate and monitor the	• OSMS inspections • Development Assessment	• Maintain adequate and functioning on-site effluent systems • Be careful with what is

Indicator	Issues and Pressures	Council's response	Community response- What you can do
	quality of On-site Sewage Management Systems (OSMS)		disposed of in the sewer
Toxic Spills	• One-off spills of certain chemicals can do a great deal of damage to wildlife, the environment and human health	• Monitoring the incidence and location of spills • Working with agencies	• Report spills and pollution
	Land		
Development Pressures	• Increasing development, as a result of increasing population and affluence, threatens the quality of our local and global environment (through increase in vegetation removal, water and air pollution, biodiversity loss and consumption of natural resources) • Strategic planning allows the consideration and management of a number of conflicting land uses in a systematic manner	• Strategic planning and zoning • Review of DA's that effect environment	• Design, build, renovate or buy homes and land that are environmentally sensitive (e.g. north facing, water tanks, solar hot water, native gardens, limited lawns, energy and water efficient, use of sustainable materials) • Participate in public consultation process, including commenting on draft plans
Open Space	• Open space has a number of social and environmental benefits	• Recreation and Open Space Strategy (draft)	• Avoid dumping garden clippings in parks and reserves • If you back onto a reserve consult Council before mowing or maintaining reserve boundaries • Join a Bush Care group • Recognise the value of parks and reserves
Roads	• Roads have a negative impact on the environment through chemical and noise pollution (from cars), vegetation removal, fragmentation of habitat, death of native animals through collision, increase in erosion and the spread of weeds. • Dirt roads near waterways that do not have adequate erosion control methods result in a reduction of water quality through sediment run-off.	• Erosion control works • Roadside Management Project (Hunter REMS)	• Try to limit car use (as demand for roads leads to supply)- cycle, walk, use public transport or carpool wherever possible as these are the most environmentally friendly forms of transport • Be aware of wildlife whilst driving, especially at dusk
	Air		
Electricity Usage	• Electricity from coal-fuelled sources relies on an unsustainable resource and pollutes our atmosphere with greenhouse gases. This is contributing to global warming, which results in erratic weather patterns and conditions and added pressure to the survival of wildlife and humans.	• Energy Action Plan • BASIX	• Buy energy efficient appliances (e.g. smaller televisions and computer screens, appliances and light globes with a high energy star rating) • Turn off appliances at wall when not in use • Reduce energy use in the home with insulation, natural lighting etc.

Indicator	Issues and Pressures	Council's response	Community response- What you can do
			• Purchase power sourced from renewable sources.
Noise			
Noise Pollution	• Noise pollution can lead to stress and is regulated through the DA process	• DA Process	• Avoid use of noisy equipment outside the hours of 8am-8pm
Heritage			
Non-Aboriginal Heritage & Aboriginal Heritage	• Aboriginal, Cultural and natural heritage is subject to pressures from increasing development and urbanisation, tourism and ageing processes	• Consultation through strategic planning and DA process	• Increase knowledge of heritage items and report any findings

The Great Lakes unique and significant natural environment deserves protection to ensure its longevity for future generations whilst providing for appropriate and sustainable growth and development. Unless appropriate and effective action is taken now we stand to lose the very asset which makes the Great Lakes region a desirable and privileged place for us to live and enjoy.

Summary of Recommendations for Council's Management Plan

A consideration of environmental issues and needs recognised in the State of Environment Report is necessary in completing council's annual reporting cycle (Figure 1). The issues raised in the State of Environment Report should be used by the council for developing its environmental strategies within the management plan and for allocating resources (budgeting, work programs).

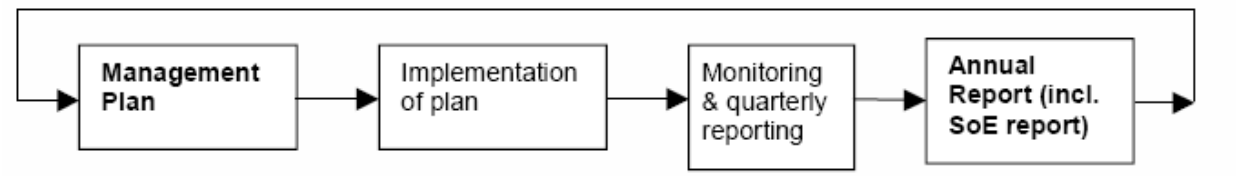


Figure 1. The Annual Reporting Cycle, Source: Department of Local Government

The 2008/09 SoE report has identified a number of needs through analysis of the indicators in this report. In relation to these identified needs a list of key projects and actions has been recommended by the SoE for consideration in Council's next Management Plan. These recommended projects and actions are presented below under relevant council sections.

Natural Systems & Estuaries

- Wallis Lake Catchment Management (progress implementation),
- Healthy Lakes Program (continue and expand initiatives)
- Improved Stormwater Management (review and update plans)
- Implement actions identified in the Water Quality Improvement Plan

- Improve performance and management of stormwater treatment devices
- Work with other agencies to remediate Fish Passage Barriers
- Develop a Vegetation Monitoring Protocol
- Biodiversity Conservation Framework (develop and adopt)
- Vegetation Strategy (refine, update and implement)
- Develop a policy/direction for Development Assessment advice
- Great Lakes Protected Area Strategy (develop)
- Acquire Satellite Imagery
- Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements
- Biodiversity education (develop and expand initiatives)
- Commence and implement Cities for Climate Protection program
- Implement Sustainability Strategy
- Develop Education for Sustainability strategy and environmental initiatives
- Implement water quality monitoring as detailed in the Water Quality Improvement Plan
- Align water quality monitoring sites and time with the NSW Shellfish Quality Assurance Program

Engineering services

- Improve performance and management of stormwater treatment devices
- Review and Improve cleanout reporting procedures
- Roadside Environmental Management Plan (progress development)

Parks and Recreation

- Develop Landscaping Code
- Continue and improve weed management activities

Waste services

- Continue and improve waste education initiatives
- Develop and implement Waste Strategy

Council wide

- Acquire Satellite Imagery
- Expand implementation of Sustainable Purchasing Policy
- Aboriginal Liaison Officer (employment)
- Collaborative Framework for consideration of Aboriginal Heritage
- Develop and Implement a Sustainability Strategy

2 Introduction

2.1 An Overview of the Great Lakes

The Great Lakes Local Government Area (LGA) is 3,373 km^2 in size and is located on the lower Mid North Coast of New South Wales, approximately 320 km north of Sydney (Figure 2). For planning purposes it is considered part of the Hunter Region (Hunter Regional Environmental Plan) and is bounded by the local government areas of Port Stephens in the south, Greater Taree in the north and Gloucester in the west. It is 85 kilometres at its widest point, 62 kilometres north to south, and has a total coastline of 145 kilometres.

Figure 2. The Great Lakes Region

Great Lakes has a temperate climate, averaging a daily minimum of 17^{0}C and maximum of 27^{0}C during summer and daily minimum of 8^{0}C and maximum of 17^{0}C in winter, and has an average coastal rainfall of 1331mm.

The LGA supports a range of industries and commercial activities, which form the basis of the local economy. Tourism and primary production (oyster, commercial fishing and grazing/ timber production) are the most significant industries in the LGA.

Figure 3. The Great Lakes natural environment

The viability and sustainability of all these industries critically relies upon a healthy and functioning local environment.

The Great Lakes possesses a unique environment of immense natural beauty, which includes extensive waterways, national parks, rural regions and mountain ranges. These landscapes provide habitat for an incredible diversity of native plant and animals. Vegetation communities include rainforest, moist and dry forests, wetlands and swamps, coastal heaths, seagrass beds, dunal formations and natural grasslands. To date, preliminary data suggests that over 500 fauna

species and 1,200 native plant species inhabit the LGA. This includes rare, significant and threatened species.

The Great Lakes region is expanding; in large partly due to the "*sea-change*" phenomenon, which is a trend that has seen a population explosion in coastal towns on the eastern seaboard. The Great Lakes LGA supports an estimated population of approximately 34,000. The population growth, measured from the 2006 census, is at 1.1% per annum. The region also experiences population surges during holiday periods with between 100,000 and 150,000 tourists frequenting the area each year, placing considerable pressure on existing infrastructure and the local environment.

Figure 4. The Great Lakes contains a great range of bird and animal life including the threatened Pied Oyster Catcher

Over the past ten years a number of factors have been identified as placing an increased pressure on the Great Lakes environment. Continuation of damaging land uses combined with significant growth in residential and visitor populations, as well as associated infrastructure provisions, probably remains the greatest threat. Water deterioration, land degradation and loss of biodiversity are amongst the major environmental issues facing the region and unless these threats can be managed appropriately we will experience a continuing decline in the health of the local environment. The deterioration of the environment will inevitably impact on our economy, way of life and the general aesthetics of the LGA. Therefore, it is imperative that we protect and manage our Great Lakes environment for present and future generations, whilst providing for appropriate and sustainable growth and development.

2.2 State of the Environment Reporting in NSW

State of the Environment (SoE) reporting provides an ongoing mechanism to monitor and to, in turn, implement steps to improve the condition of the local environment. The measurement of established indicators to determine changes and trends within the environment allows this report to document environmental change, both positive and negative, to assist in the management of our natural resources. Furthermore, SoE Reporting is intended to give an account of government, industry and community activities to protect and restore the environment. Finally, SoE Reporting provides a valuable education and awareness tool for the general community and all tiers of government.

Local Government plays a vital role in environmental management and is one of the primary land management authorities that is responsible for decision-making and regulation of land use development

as well as environmental monitoring and management programs. As several areas of Council core business directly relates to or influences environmental management, environmental reporting within local government is an important process.

The State Government identified the need for environmental reporting at the local level and established that Councils be responsible for preparing SoE reports on an annual basis. Hence a legislative framework under the *Local Government Act 1993* was established, which required:

- Council to prepare a Comprehensive SoE Report every four (4) years, coinciding with the end of the financial year following the general Council elections and the production of supplementary SoE reports every year in the interim;
- The SoE report to specifically investigate eight (8) environmental sectors: land, air, water biodiversity, waste, noise, Aboriginal heritage and non Aboriginal heritage;
- Within each of the above sectors, Council give reference to Management Plans, special Council projects and to the impact of Council's activities and decision-making on the environment;
- That SoE reporting be tied to the development and documentation of Council's Annual Management Plan;
- That the Comprehensive SoE Report be based on *a "Pressure-State-Response"* model (see below);
- That SoE reporting Include an emphasis on and commitment to implementing the principles and practices of Ecologically Sustainable Development (ESD);
- That the SoE reporting process consults and involves the community (including environmental groups) and produces the report in a format that is easily understandable by the community.

Furthermore, the *Threatened Species Conservation Act 1995* requires that a Council that is identified within an approved Recovery Plan or approved Threat Abatement Plan as being responsible for the implementation of actions within such plans, shall report on the actions that it has undertaken within the SoE Report.

Pressure-State-Response Model

The pressure-state-response model for reporting on environmental sectors, includes:

- a pressure component, which identifies and describes the pressure that human activities put on their immediate environment and their natural surroundings,
- a state component, which identifies and describes the current and projected state of the environment, and
- a response component, which identifies and describes the response of councils, government agencies, industry and communities to the pressures on, and state of, the environment.

For example, when reporting on water quality, an increase in nutrients entering a local waterway may be monitored and identified. Increased nutrients may lead to algal blooms and declining aquatic health (thus is recognised as a pressure). The declining condition of the quality of the local waterway

constitutes the state. Once identified and recognised, the issue might be addressed through an education program on stormwater pollution within the catchment or a structural solution (which is the response).

Whilst adopted by most NSW Councils, the model does have some identified shortcomings and limitations. In some cases indicators cannot be easily categorised as a state, pressure or response and some times a particular indicator may fall in all three categories. For example, the clearing of vegetation can be an indicator of the "state" of vegetation in the local environment, "pressure" for biodiversity issue, or "response" if the rate of clearance is arrested. Furthermore, there is not always a clear indication of cause and effect.

With these limitations in mind, this SoE report does not heavily utilise the PSR model. Rather, each sector (eg. Water, Biodiversity etc) contains an introductory section that discusses the state and pressures of the sector in general terms. The results section of each indicator also provides information on the State component. The response of council and other groups is discussed specifically, where applicable. A special section, Environmental Plans and Strategies also provides an account of Council's response to environmental issues.

The abovementioned limitations also make it hard for Council to include all of the environmental works and projects that it undertakes. In April 2009, Council prepared a report in application for an increase and the permanent establishment of the Environmental Special Rate (ESR) which funds almost all, or a portion, of Councils environmental projects. The ESR report (2009) is a summary of achievements from 2004-2009 which includes projects and outcomes that cannot be included in the SoE under the current indicators, and is attached to this report (Appendix 1).

Ecological Sustainable Development (ESD)

Ecological sustainable development (ESD) means "*using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased*" (Commonwealth of Australia 1992).

Essentially, ESD is a means of effectively utilising resources with minimal environmental change to protect the natural environment and its resources/ services for future generations. An important part of ESD is the application of the Precautionary Principle. In essence, this suggests that where there are risks of serious environmental damage, that lack of scientific knowledge should not be used to postpone or defer environmental protection. As such, it requires adequate scientific knowledge to form the basis of all environmental decision-making.

Typically local government has traditionally undertaken natural resource management, economic development and provision of social services in isolation from each other. However it has since been recognised that these factors are related and that they interact in a complex manner. Subsequently, Councils are now required to undertake the management of their regulatory and service functions in an ecologically sustainable manner, as legislatively required under the Local Government Act.

Under the ESD Regulation, Councils must consider its most recent comprehensive SoE report when preparing the part of its draft management plan dealing with environmental protection activities (cl 6M(b)). As such SoE reports are a key mechanism in identifying and evaluating sustainability issues.

2.3 State of the Environment Reporting in the Great Lakes

In 2004, Great Lakes Council implemented a revised approach to SoE Reporting that aimed to develop an effective and useable document designed to feed more effectively into Councils Management Plan for the purpose of identifying resources and directing staff work programs in line with priority environmental projects. To achieve this, a SoE working group comprising of representatives of various Council sections was formed.

The 2008/09 Comprehensive report seeks to provide information on the state of the Great Lakes environment for the period of 1st July 2008 to 30th June 2009. It forms the fifth data collection period for this years comprehensive report. Usually four years of consecutive data is collected before a comprehensive report is produced, however, because of the timing of the Council election it has been 5 years of data. It is in this comprehensive report that trend analysis will be conducted based in the last 5 years of data.

Future Indicators for Subsequent SoE Reporting

There are presently a number of gaps in environmental reporting conducted as part of SoE for the Great Lakes LGA. This is despite considerable efforts in recent years to rationalise, enhance and refine appropriate indicators. Also, SoE reporting needs to continually evolve and improve as new environmental issues and management arises so that these are incorporated or represented. Thus, a number of new indicators should be considered for use in this report, including:

- An Indicator on the achievement of actions associated with the Bitou Bush Threat Abatement Plan (e.g. monitoring of ongoing community and Council control of Bitou Bush)
- Re-adoption of the indicator regarding important landscapes for water quality (steep slopes, wetlands, riparian zones etc.)
- An indicator to monitor water harvesting from local rivers (e.g. Wallamba, Coolongolook and Myall Rivers water sharing plans).

3 Water

The Great Lakes LGA depends heavily on the health and sustainability of local waterways as these landscapes form the basis of the region's economy (supporting tourism and primary production), contribute to our way of life and amenity, and provide habitat for extraordinary biological systems. However the catchments supporting these waterways are under increasing environmental pressure, threatening this significant resource. Pollution and impacts associated with catchment land use, development and tourism are amongst the greatest threats, potentially resulting in a decline of the health of our waterways.

In 2002 the state of the majority of our waterways was classified as "generally healthy -modified" by the Healthy Rivers Commission (Now the Natural Resources Commission).
Since that time, the Coastal Catchments Initiative conducted extensive monitoring that was performed over a 1.5 year period. The data collected was used to determine the ecological condition of Wallis, Smiths and Myall Lakes.

However, it is widely recognised that all local waterways are critically susceptible to increasing environmental pressures. The 1997 Hepatitis A event in Wallis Lake, reoccurring blue-green algae in Myall Lakes and episodic fish kills are all testament of such.

3.1 Water Quality

Introduction

The deterioration of water quality is often associated with the impact it has on human health and recreational activities as opposed to the natural environment. Subsequently the current extent of water quality monitoring within the Great Lakes region is generally designed for this purpose. Furthermore, water quality monitoring as an indicator of general environmental health is often expensive, resource-intensive and difficult to collate and interpret. The state and trends of the water quality in rivers, creeks and estuaries in part helps provide an indication of the impacts associated with environmental pressures across the entire catchment, and can be an important reference from which environmental trends can be determined.

Figure 6. The Lower Wallamba River

Monitoring

Despite the significance of the local waterways, no agency, including Council, has ever facilitated the development of an integrated ongoing water quality-monitoring program across the LGA. Instead, local and state government, tertiary institutions, local water authorities, industry and volunteer groups have undertaken water quality monitoring independently of each other.

The Coastal Catchments Initiative is an Australian Government Initiative that focuses on improving water quality in coastal 'hot spot' areas. Council received $2.09M in funding from the Australian Government to implement the CCI in partnership with government agencies and the local community.

The monitoring that occurred during the CCI was on a project basis and is not an ongoing monitoring program. However the Water Quality Improvement Plan (WQIP) developed from the CCI include plans to implement a monitoring program that will track the performance of the WQIP, and monitor the ecological condition of the waterways.

The WQIP focuses on chlorophyll-a concentrations as the primary ecological indicator given the link between nutrient inputs and chlorophyll-a concentrations. Water clarity and turbidity are still considered to be useful indicators, however it is assumed that actions which control nutrient exports from catchments will usually control sediments and thus contribute positively to protecting water clarity and seagrass extent targets.

MidCoast Water carries out a number of environmental testing programs to monitor the impact of treated effluent release on the receiving water environment. MCW also carries out environmental monitoring of Frys Creek and the Myall River, at Bulahdelah. The monitoring involves quarterly water sampling covering chemical, physical and biological parameters. Testing is carried out at three sites at Frys Creek and two sites at Myall River.

A similar survey monitors the water quality of Mill Creek and the Karuah River at Stroud on a quarterly basis. Testing is carried out at two sites on Mill Creek and two sites on the Karuah River.

Groundwater monitoring is carried out near the effluent release areas in Tuncurry, Hawks Nest, and Hallidays Point. Sampling and water testing for an extensive range of parameters is undertaken every three months from a series of boreholes.
To monitor the environmental performance of the Stroud effluent re-use scheme, a groundwater monitoring and testing program has been introduced.

There is also a monitoring program being undertaken independently by the Department of Environment, Climate Change & Water (DECCW). DECCW is monitoring the chlorophyll concentrations and water clarity in Wallis Lake as part of the state Monitoring Evaluation and Reporting (MER) Strategy. The MER Strategy was prepared by the Natural Resources and Environment CEO Cluster of the NSW

Government in response to the Natural Resources Commission standard and targets, and was adopted in August 2006.

As part of the strategy Wallis Lake has been selected as one of 7 estuaries across the state to be sampled each year to track inter-annual variability.
Wallis Lake is thus sampled 6 times each year from September to March, at approximately 3 weekly intervals each year. For the purposes of the State of the Environment Report, DECCW has provided the monitoring data to date.

The establishment of a sub-regional Water Quality Network group occurred in July 2005. The group formed in response to a lack of integrated water quality monitoring across the region. This Water Quality Partnership comprises representatives of Great Lakes Council (GLC), Greater Taree City Council (GTCC), MidCoast Water (MCW), Hunter Central Rivers Catchment Management Authority (HCRCMA), Department of Environment, Climate Change & Water (DECCW) and the Department of Natural Resources (DNR). The objective of this network is to develop a central Geographic Information System (GIS) and database of water quality data, which is accessible to all parties via the Internet.

It is hoped this regional approach to water quality monitoring will directly assist Council's SoE report, as well as allowing a more strategic approach to monitoring as gaps and overlaps in data are identified. However, until the network is functioning and the information is compiled and supplied in a useable format, such data will not be available for SoE reporting. The Water Quality Partnership has developed an electronic platform for data sharing and reporting, however data on water quality has not been entered in time for utilisation in this report.

Depending on the specific details of current monitoring programs, it is anticipated that a combination of data in relation to the following parameters will be available for future SoE reports:

- turbidity and suspended solids, which indicate the concentration of particles (sediment or microscopic aquatic life) in the water;
- temperature, which influences the productivity of aquatic ecosystems;
- pH, which measures acidity/alkalinity. A level of 7 is neutral. The pH of sea water is slightly alkaline at around 8.2;
- salinity (or conductivity), which measures the amount of salts;
- dissolved oxygen, which indicates the amount of oxygen available for aquatic life;
- nutrients such as phosphorus and nitrogen, which are essential for plant growth and indicate the potential for algal blooms;
- inorganic chemicals, mainly heavy metals, which can be toxic to aquatic life;
- organic chemicals, such as pesticides, petroleum products, which can be toxic to aquatic life;
- chlorophyll-a, which is a measure of the amount of plant matter, including microscopic algae and seaweeds;
- algal levels; and

- faecal coliform numbers, being the level of bacteria which come from animal and human wastes in water.

Results

A number of agencies and organisations have conducted water quality monitoring in this LGA during the 2008/09 reporting period. However this data is not currently available in a useable and manageable format. Subsequently such information will not be reported in SoE Reports until a coordinated approach to water quality monitoring is established and a means for data sharing and reporting has been developed. An overview of some of the monitoring programs conducted by agencies across the LGA has been presented below.

Table 3.1.1: Water quality monitoring programs conducted in the Great Lakes LGA.

Great Lakes Council			
Program / sites	Parameters	Monitoring Frequency	Purpose (aims & objectives)
Waterwatch 4 constructed wetlands in Forster, 1 constructed wetland in Tuncurry, 2 sites within Forster Keys, 3 sites at Smiths Lake	Temperature, total dissolved oxygen, total dissolved solids, turbidity, pH	Testing is undertaken as often as volunteers are able to do so, (usually monthly)	Community education through on-ground action to provide a general indication of the quality of waterways within the Great Lakes
Coastal Catchment Initiative	Nitrates, Phosphates, Turbidity, Sediment and nutrient interactions	After rain events and grab samples throughout catchment monthly	To develop decision support models based on processes occurring within the Myall, Smiths and Wallis Lakes
MidCoast Water			
Program / sites	Parameters	Monitoring Frequency	Purpose (aims & objectives)
13 Sites in Wallis Lake	FC, Temp, Density	Dependant on Oyster Growing Season average 30 runs/ year	Oyster quality assurance/ environment
Stormwater Monitoring Program 9 sites in Tuncurry, 31 Sites in Forster, 1 site in Green Point	FC Temp	Bi-Monthly	Oyster quality assurance/ environmental
Frys Creek Environmental Monitoring Program 3 sites Frys Creek Bulahdelah, 2 sites Myall River above Bulahdelah	DO, Salinity, Temp, pH, FC, Enterococci, BOD, Total P, Dissolved reactive Phosphorous, Nitrate, Nitrite, TKN, Ammonia, Total N, Oxidised Nitrogen, Suspended Solids, Chlorophyll a, Turbidity, Oil and Grease, Conductivity	Quarterly	Sewerage treatment plant licensing agreement/ environmental
Mills Creek Stroud 2 sites, Karuah River Stroud 2 sites	DO, Salinity, temp, pH, FC, Total P, Dissolved Reactive P, TKN, Ammonia, Total N, Oxidised N, Suspended Solids, Chlorophyll a, Turbidity, Conductivity	Quarterly	Environmental
NSW Shellfish Quality Assurance Program			
Program / Sites	Parameters	Monitoring Frequency	Purpose (aims & objectives)
23 water sampling sites 10 oyster meat sample sites	Algae & faecal coliforms from water sample. E. Coli samples of	Fortnightly and following rainfall events	Oyster quality assurance for human health

	oyster meat		
Department of Environment and Climate Change			
Program/Sites	Parameters	Monitoring Frequency	Purpose (aims & objectives)
3 zones in Wallis Lake 5 Sites within 3 zones	Chlorophyll - a Turbidity	September - March, 6 times, 3 weekly intervals	MER Strategy

Community Water Quality Monitoring- Waterwatch

Great Lakes Council and the Catchment Management Authority facilitate a number of volunteer community and school groups who monitor water quality in local waterways using the Waterwatch techniques (Go to www.waterwatch.org.au for more info).

A summary for each Waterwatch testing site that is tested regularly (i.e. every couple of months or more) is provided below. Some indication of water quality in these areas is given by outlining how often the tests show typical or desired levels of water quality and how often the tests show the site to be out of healthy range for that indicator. For example healthy waterways have a pH or acidity level of between 6 and 8 units. If a test showed the pH to be 9 this would be out of the healthy range.

Table 3.1.2 Summary of Results for Waterwatch sites, based on tests performed during reporting period.

Site	No. of tests	% time Dissolved oxygen fair or good	% time pH fair or good	% time turbidity fair or good
Forster Keys- Rear of King George Pde	4	75%	100%	100%
Forster Keys - entrance to Dolphin Passage	4	75%	100%	100%
Smiths Lake - Amaroo Drive	6	50%	83%	100%

The Coastal Catchments Initiative Project has developed a Water Quality Improvement Plan (WQIP) for the Great Lakes Area. Through this plan we are able to determine the current state of the lake systems, however as yet this is not an ongoing monitoring program.

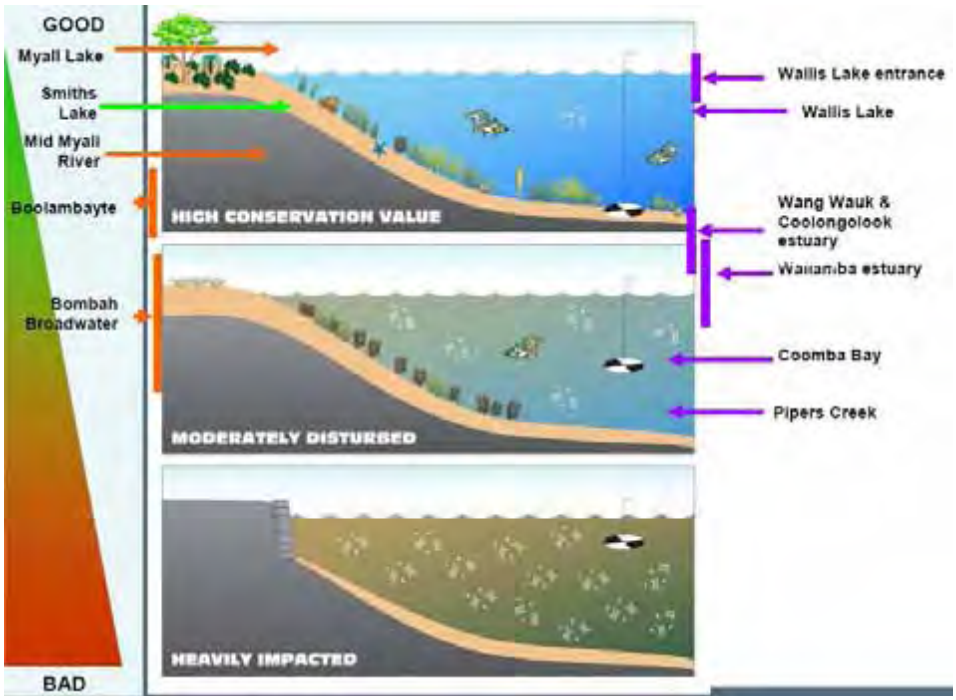


Figure 7. Current ecological conditions of the Great Lakes

The conditions of the lakes varied from having a high conservation value for Myall, Smiths and Wallis Lake to being low on the scale of moderately disturbed for Pipers Creek, Coomba Bay and Bombah Broadwater (see Figure 7).

The WQIP includes long term ecological targets that have been determined by DECCW. These are shown in the table below.

Table 3.1.3 Ecological target values

Long Term Targets	High Conservation		Slightly to Moderately disturbed	
	Chl-a (ug/L)	Turbidity (NTU)	Chl-a (ug/L)	Turbidity (NTU)
Lake	1.8	2.6	2.6	3.6
Estuarine Rivers				
Upper	5	8	6.6	11.5
Mid	4.2	7.5	5	10.7
Lower	2.2	?	2.3	?

The WQIP reports on the average chlorophyll-a concentrations found over Wallis, Smiths & Myall Lakes. These concentrations represent the current status of the lake systems. These values have been mapped and can be compared to the target values in table 3.1.3.

Figure 8. Average chlorophyll -a concentrations across Wallis Lake

The southern bays of Wallis Lake have largely intact catchments and research undertaken by DECCW has highlighted the near pristine condition of these bays. They support a wide variety of seagrass, healthy algae and brackish water plant (macrophyte) communities. All of these plant communities are

dependent on clear clean water with very low nutrient loads. Current measurements for the southern bays have average chlorophyll concentrations less than 1ug/L and turbidity below 2 NTU. These near pristine conditions have allowed the continued survival of the ecologically important seagrass and macrophyte communities, with their associated biodiversity, including the increasingly threatened estuarine sponges in the southern part of Wallis Lake. These clear water brackish macrophyte and sponge communities are mostly unique and endemic to Wallis Lake. Most of the Wallis Lake sponges are new to science and have not yet been formally named.

Smiths Lake has been identified as having a High Conservation Value. Across Smiths Lake chlorophyll-a concentrations ranged from 0.55 ug/L to 0.88 ug/L (average = 0.65 ug/L), well below the trigger value identified for lakes with are considered pristine or high conservation value status. Turbidity was low (1.3 NTU). Together these indicators show the good ecological condition of the water body.

The Myall Lakes system consists of four interlinked water bodies that probably originally had ecologies that were fundamentally similar, but differed in detail due to the effects of salinity.

The WQIP reports on Myall Lakes as three zones:

- Myall Lake
- Boolambayte Lake & Two Mile Lake (referred to as Boolambayte Lake)
- Bombah Broadwater

These zones are indicated in figure 9.

Also evident in the figure is that chlorophyll-a concentrations are highest in the river-estuary sections of the Upper Myall and in the Bombah Broadwater, which has a higher degree of human disturbance than other areas of the lake. Myall Lake and Boolambyte Lake have relatively lower levels of chlorophyll-a than these areas. The current chlorophyll and clarity status for Myall Lake and Boolambyte Lake is very good.

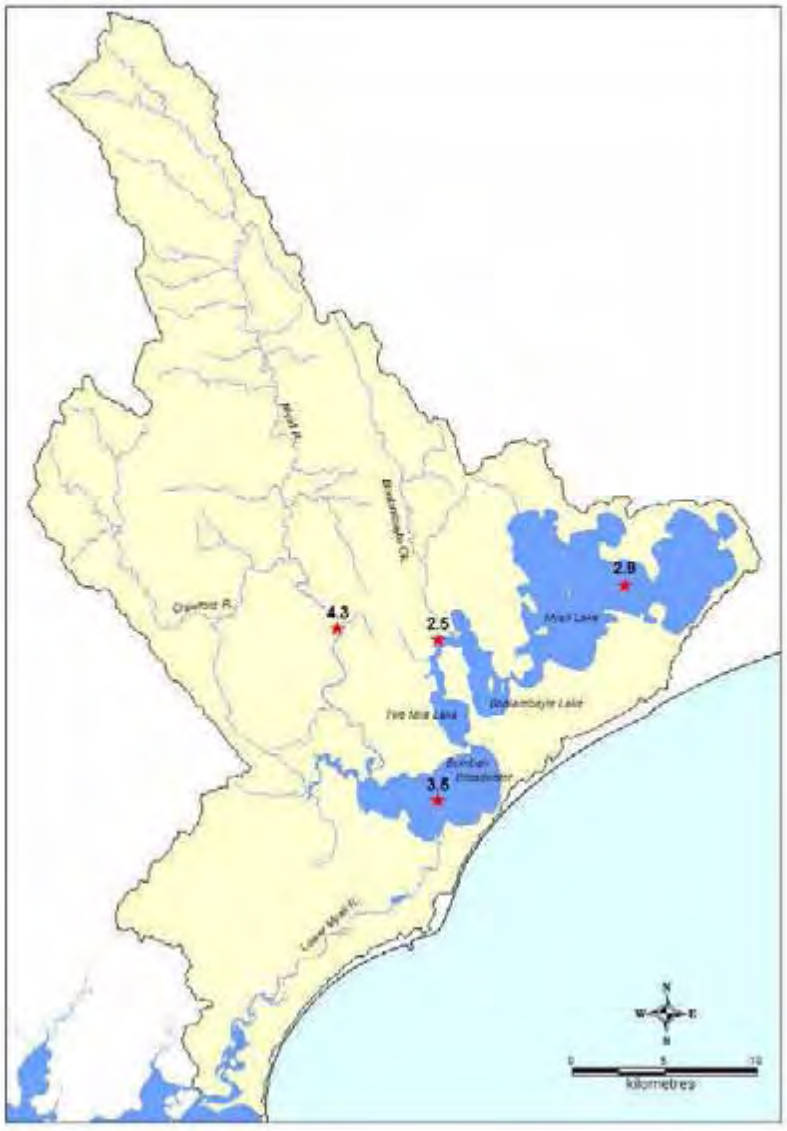


Figure 9. Zones of the Myall Lakes and average chlorophyll-a concentrations

DECCW has provided water quality data obtained through the monitoring program as part of the MER Strategy as mentioned above. The figures below show water quality data for Wallis Lake, chlorophyll-a and turbidity. Chlorophyll-a is the green pigment that is responsible for a plant's ability to convert sunlight into energy. The amount of chlorophyll-a in the water allows us to know the amount of algae present in the water, which in turn gives us an indication on the quality of the waterway.

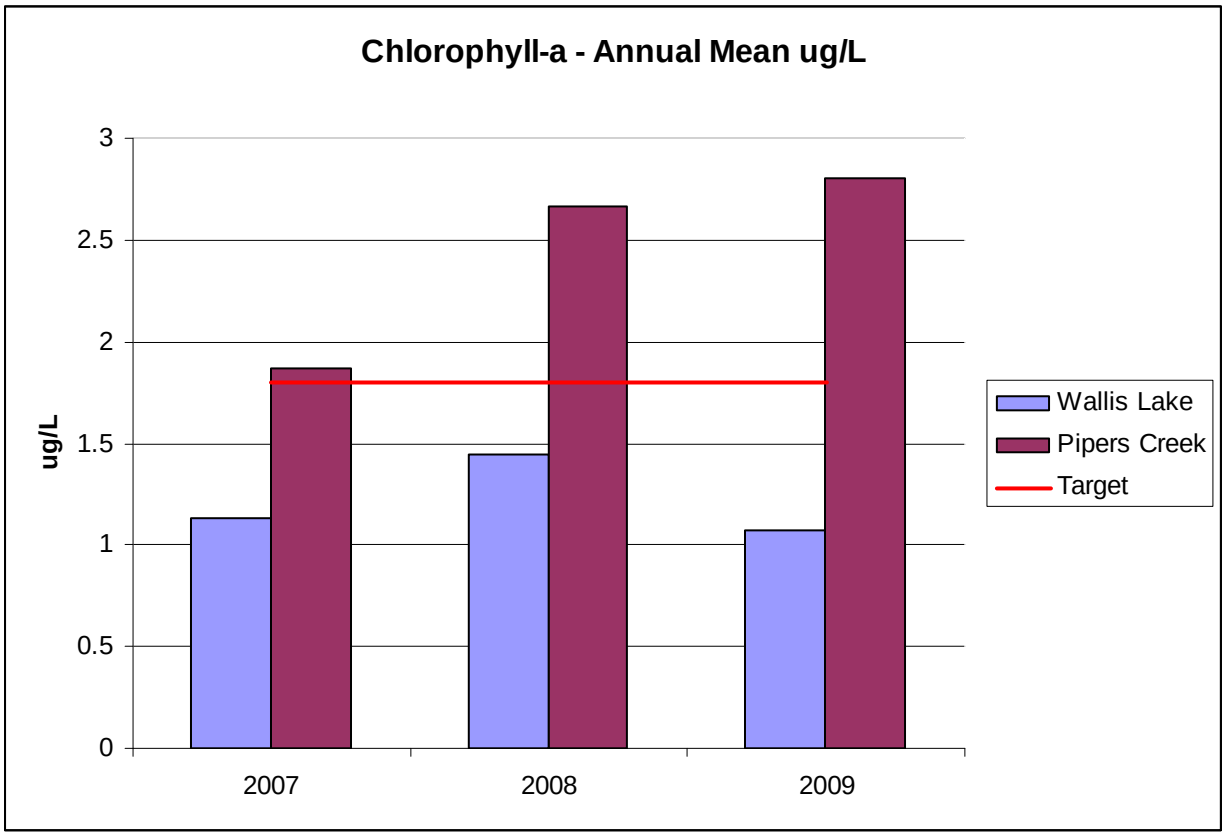


Figure 10. Chlorophyll-a concentrations for Wallis Lake and Pipers Creek

Figure 10 shows the annual averages of chlorophyll-a concentrations for Wallis Lake and Pipers Creek between 2007 and 2009.

The Water Quality Improvement Plan (WQIP) specifies ecological targets for both chlorophyll-a and turbidity (see Table 3.1.3). The target for chlorophyll-a concentrations is 1.8 µg/L. Figure 10 shows that Wallis Lake stays below this target whilst Pipers Creek has increasingly exceeded this target each year.

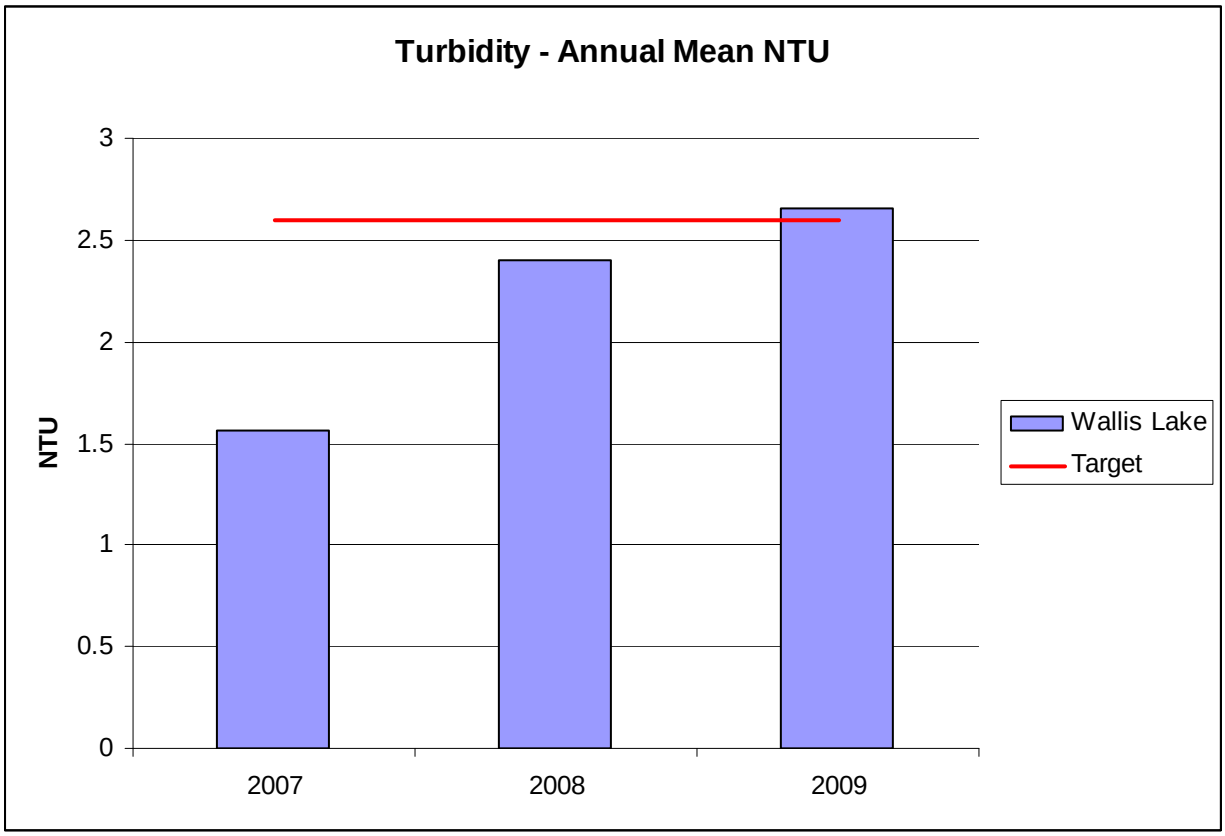


Figure 11. Turbidity values for Wallis Lake

The ecological target for turbidity is 2.6 NTU's. Figure 11 shows that Wallis Lake only just sits under this target, but slightly exceeds it in 2009.

Sustainable Farming Program

A large proportion of the land that makes up our lake catchments is privately owned. Land management practices on rural private land in the local government area have a significant effect on water quality and biodiversity. Significant environmental issues on private rural land in the LGA include soil degradation and erosion, loss of vegetation and biodiversity, and impacts on stream health and water quality through stock contributing to bank erosion and faecal contamination of waterways.

Great Lakes Council has worked successfully with rural landholders to assist landholders in improving Natural Resource Management through the Rural Incentives Scheme (RIS). With the end of RIS funds for incentives for NRM programs, GLC continue to assist landholders to apply for incentives through the Catchment Management Authority. Incentives programs continue to be successful in supporting on-ground action on private property, but limits to the availability of funding mean that to achieve the goal of landscape scale change in rural landuse, there needs to be ongoing land management change without relying on external incentives.

The Great Lakes Sustainable Farming Program aims to facilitate sustainable, productive landuse in the Great Lakes. Councils vision is a viable, resilient local food economy that supports and is supported by healthy natural systems. Council uses localised and regional networking, participatory action learning

and action research to help empower land managers to develop locally adapted, co-operative solutions for sustainable agriculture.

The overall method and philosophy in running the program is Participatory Action Learning (PAL). This is a process that acknowledges and values existing local knowledge, allows participants to adapt the learning agenda to their own needs and interests, encourages learning by doing, and emphasises a continually emergent hands-on learning cycle of planning, implementing, monitoring and reviewing. PAL has been chosen as a powerful tool for adult learning, which allows participants to have ownership of their learning journey and achieve sustainable change. Facilitated group workshops encourage sharing of information between participants, with experienced land managers actively encouraged to mentor those with less experience.

Facilitators' input emphasises the vital importance of the health of natural systems to productive systems, and the fundamental interconnectedness of all living and non-living elements of the farm system.

The program has established four (4) new Sustainable Farming Groups, with memberships of 15-25 each. The groups have provided an excellent social outlet for members, have got neighbours talking, often for the first time, and have generated a lot of interest in sustainable farming. The 2009 program has so far seen 20 local PAL workshops (5 each for 4 groups, with one more for each group in the first course of workshops), with average local sustainable farming group turnout of 15 landholders.

Figure 12. Members of the Wallamba Sustainable Farmers group learning how to monitor water quality on their properties

So far in 2009 there have been 14 professional or special interest workshops held, with a cumulative attendance of 400 workshop attendances by 250 landholders. We are seeing a genuine groundswell of interest in sustainable agriculture, particularly biological and holistic methods, with professional workshops now routinely attended by 40-50 landholders. Importantly, landholders are increasingly offering to host speciality workshops, which provides a well received opportunity for landholders to learn from peers.

The fundamental change being sought, is at a personal and community level, is difficult to quantify, but this growing interest in the community is a very positive indicator.

Summary

Water quality monitoring must play a vital role in assessing the state of the natural environment as well as providing an evaluation tool for the environmental management projects of Council (and other agencies/stakeholders). As documented above, a range of agencies and organisations conduct various water quality-monitoring programs across the Great Lakes LGA. However unless a coordinated, scientifically valid and integrated approach is developed this indicator will remain difficult to assess. The WQIP sets out a monitoring program (similar to CCI monitoring) that if implemented will serve to keep track of the water quality status in the Great Lakes. In the meantime Council aims to provide an overview of water quality monitoring programs conducted within the region upon which additional information can be included as it comes to light. Hopefully this will assist in eventually providing meaningful water quality data, which paints an accurate picture of the health of our local waterways, and hence the surrounding catchment environment.

Trend Analysis

Due to the sporadic nature of water quality monitoring across the LGA it is very difficult to observe any trends across the entire reporting period.

Current Response and Future Directions

Council recognises the enormous environmental, economic and social value that good water quality has for our local area. Thus, a number of important projects have been developed and are being implemented to help protect and improve water quality in the Great Lakes. These projects and initiatives include:

- Water Quality Improvement Plan - Wallis, Smiths and Myall Lakes
- The Healthy Lakes Program (a community education program helping business, residents and tourists reduce their impact on stormwater and water quality)
- Constructed Wetlands and Gross Pollutant Traps (to reduce stormwater pollution)
- Installation of WSUD devices - biofiltration systems
- DA Assessment and Strategic Planning (to reduce the impact of development on water quality)
- Darawakh and Frogalla Wetland Management plan and associated actions to reduce the effects of Acid Sulfate Soils
- Wallis Lake Catchment Management Plan and Wallis Lake Estuary Management Plan
- Smiths Lake Estuary Management Plan
- Port Stephens/ Myall Lakes Estuary Management Plan

Table 3.1.5 Identified Needs for Action Regarding Water Quality

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Continue to implement and expand programs aimed at improving water quality e.g. Water Quality Improvement Plan, Wallis Lake Catchment Management, Healthy Lakes Program, Water Quality Partnership etc.	• Water Quality Improvement Plan (implementation) • Wallis Lake Catchment Management (progress implementation), • Healthy Lakes Program (continue and expand initiatives)	Natural Systems	Y	Ongoing
Review Stormwater Management Plans	• Improved Stormwater Management (review and update plans)	Natural Systems	Partial	Immediate
Implement a water quality monitoring program across the LGA	• Implement water quality monitoring as detailed in the Water Quality Improvement Plan	Natural Systems	Partial	Within 2 years
Review existing monitoring programs	• Implement water quality monitoring as detailed in the Water Quality Improvement Plan • Align water quality monitoring sites and time with the NSW Shellfish Quality Assurance Program	Natural Systems	Partial	Within 2 years

3.2 Water Usage

Introduction

Water usage and supply has become a contentious issue throughout Australia in light of global climate change, recurring and worsening drought situations and the increasing demand for domestic, agricultural and industrial water. To meet the ongoing future water requirements of residents, industry, agriculture and the environment it is essential that this natural resource be managed sustainably and appropriately. Water conservation is both a human resource issue, but also an environmental issue, as adequate flows in streams, floodplains and wetlands is critical for general environmental health.

Potentially the over-exploitation of water resources can have a significant effect on the local environment, depriving rivers, lakes and estuaries of natural water flows essential to their function and inherent quality. As such, monitoring water usage provides an indication of the pressure on the local environment. Within the Great Lakes, this information is available from the local water authority, MidCoast Water, who are responsible for managing water resources and infrastructure throughout the wider region.

Figure 13. Water is a valuable and limited resource that needs to be conserved and used efficiently

The Great Lakes relies on a number of different water sources. The major towns, including Forster/ Tuncurry, Nabiac and Pacific Palms, receive water from Bootawa Dam (off-river storage of the Manning River), which is located in the Greater Taree City Council LGA. Hawks Nest/Tea Gardens draws its water supply from bore fields to the north of Tea Gardens on the Myall Lakes/ Viney Creek sand beds. The Stroud water supply is drawn from the Karuah River and Bulahdelah draws its water from the Crawford River. To secure future water supplies and meet predicted demand, the Nabiac borefield is under construction with all bores in place to supplement the Bootawa Dam supply from the Minimbah aquifer. The construction of the water treatment plant and the connection to the water supply is yet to start.

Monitoring

For this indicator, the total volume of water used and a breakdown of usage for residential, commercial, industrial, institutional and public use purposes provides information on the pressure placed on the local environment and attributes water demand to different sectors. This data is accessible from the local water authority, MidCoast Water, as water meters record the information for all properties connected to reticulated water systems.

Results

For the 2008/09 reporting period a total of **17,146** properties were connected to the water supply system within the Great Lakes area with **71** new connections during this period. The total volume of water consumed during this period was **3332** million litres, slightly higher than last year but still at a reduced level. A breakdown of water consumed by each sector of the community has been provided in Table 3.2.2

Table 3.2.1 Number of existing and new water connections

	04/05	05/06	06/07	07/08	08/09
Total number of properties connected to water supply system:	16513	16799	16940	17075	17146
New connections	208	286	141	96	71

Source: MidCoast Water

Table 3.2.2: Volume of water consumed by each community sector

Consumption Category	Volume million litres (ML) 2004/05	Volume million litres (ML) 2005/06	Volume million litres (ML) 2006/07	Volume million litres (ML) 2007/08	Volume million litres (ML) 2008/09
Residential	3911	2854	2635	2464	2281
Commercial	301	592	556	545	633
Industrial	73	238	213	187	312
Institutional	17	61	56	54	58
Public Use	37	73	72	62	48
Total	**4339**	**3818**	**3532**	**3312**	**3332**

Source: MidCoast Water

Summary

It is pleasing to see that water consumption has dropped and stayed low over the last five reporting periods, even though there were new connections. This indicates a slightly reduced pressure on our water resources. This may be as a result of an increased ability to use water more efficiently as a consequence of Water Wise, rebate programs and price incentives.

Trend Analysis

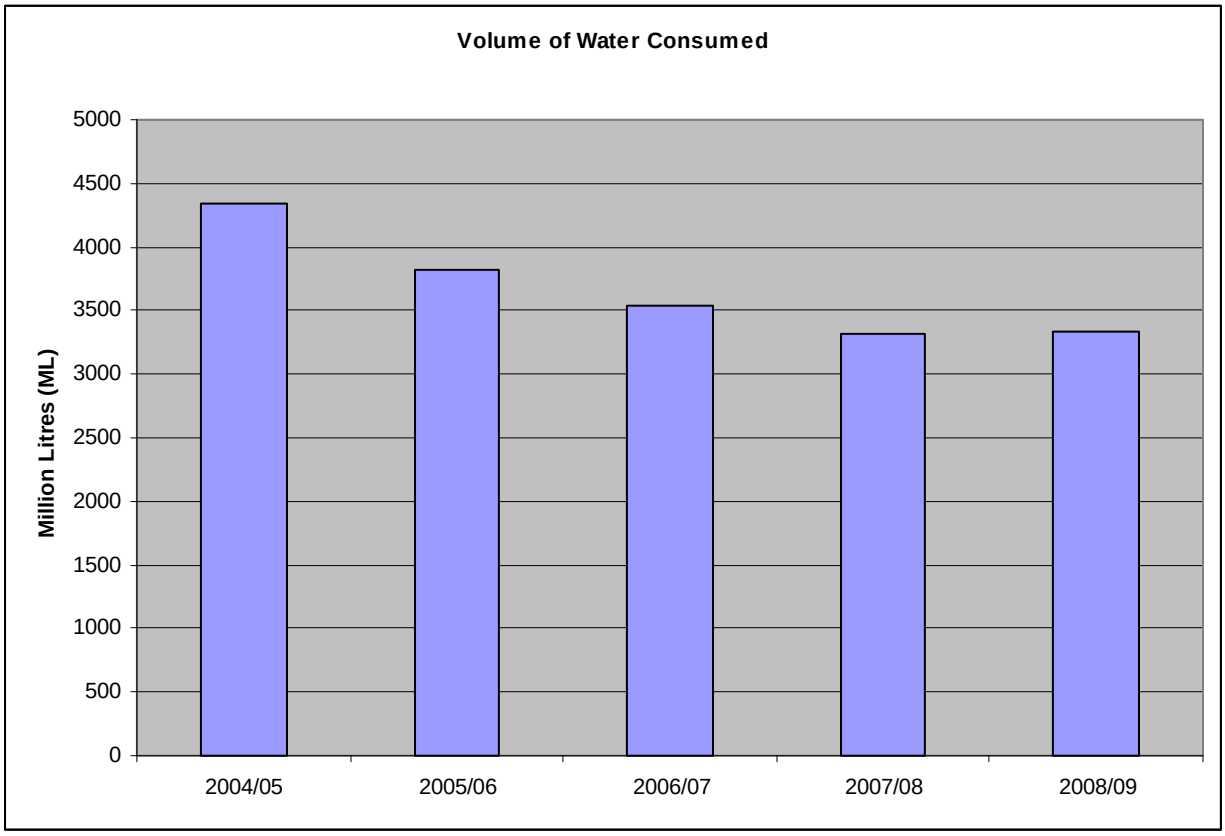


Figure 14.Shows the total volume of water consumed in million litres (ML)

Figure 14 shows how the consumption of water has reduced and stablised over the last five reporting periods. Given the current pressures on water consumption this is very pleasing to see.

The data shows that from 04/05 to 08/09 there has been an overall reduction in water consumption by **30%.** As mentioned above there has been wide promotion of the Water Wise program (including Whizzy the Water Drop), rebate programs and price incentives. Additionally, all new houses need to comply with the BASIX system to incorporate water sensitive design.

Figure 15. Whizzy the Water Drop helps to spread the word on water conservation

Current Response and Future Directions

MidCoast Water is the responsible agency for ensuring effective and sustainable water use. Currently, MidCoast Water (MCW) is undertaking a number of projects to secure the provision of future water supply of the Great Lakes LGA. Updates against these projects are provided below.

Nabiac Borefield Ecological Survey Groundwater Dependant Ecosystems

MidCoast Water is working towards a diversified water supply, by developing a borefield supply to supplement the Manning Water Supply Scheme (the supply for 90% of MidCoast Water customers). This will help protect environmental flows in the Manning River, but can be expected to have an environmental impact on the Nabiac Aquifer. MidCoast Water's ecological study into the effects of groundwater extraction on dependant ecosystems is ongoing, and is designed to allow for future management to minimise the impacts of water extraction.

Recycling Scheme Developments

MidCoast Water has a number of planned effluent reuse schemes currently in the concept or design phase. There are planned recycling schemes which will see the use of highly treated effluent for irrigation of golf courses, agricultural land and some public grounds. Schemes are planned for Forster, Tuncurry, Bulahdelah and Hawks Nest. These reuse schemes will reduce the amount of treated effluent released into waterways, and will reduce demand on potable water supplies.

WaterWise Rebate Scheme

MidCoast Water's rebate scheme is in its second year. Customers of MidCoast Water are able to access up to $1500 in a cash rebate scheme to help make their homes water smart. The Rebate Program allows customers in homes built before BASIX to access some assistance to refit things such as water efficient household appliances and rainwater tanks.

The program provides incentives to install water efficient appliances, which will have an effect in reducing overall water consumption, and therefore reduce the amount of water MidCoast extracts from and returns to the environment.

Water efficient devices covered by the program include water efficient showerheads, dual flush toilets, dishwashers and washing machines. Connecting a rainwater tank for use in either the garden, toilet or laundry (or all three) also attracts a rebate under the system.

Smart Meter Program

A pilot program is underway to introduce electronic "smart meters" to residential properties in the area. The smart meters record when and where water is used in a home, providing information to householders which can be used to help identify ways for MidCoast water customers to reduce their overall water consumption, thereby reducing the need for MidCoast Water to extract water from the environment.

New Wastewater Treatment Plant at Stroud

Work has been completed on a new Stroud Sewerage Treatment Plant, situated on Simmsville Road, which replaces the 30 year old operation in Spencer Street.

The new plant caters for 1500 ep (equivalent persons), double that of the old plant.

The plant treats effluent to a level suitable for use on agricultural land – extending MidCoast Water's reuse program to see 95 per cent of recycled water from the new Stroud plant beneficially reused, which will minimise the amount of treated water going into the sensitive Karuah River.

To achieve this reuse target the new plant includes the capacity to store up to 28 million litres of treated water.

Water Pricing

MidCoast Water has made changes to its pricing structure designed to encourage water conservation practices. MidCoast Water has a two-tier pricing structure. Customers will pay $2.02 per kilolitre for the first 50 kilolitres per quarter. Customers using in excess of 50 kilolitres per quarter will pay $2.24 per kilolitre. These new charges apply for water consumed from 1 July 2009.

Source: MidCoast Water

3.3 Algae Blooms

Introduction

Algal blooms are complex events that are influenced by a combination of different factors including flow, turbidity, light, salinity and nutrient loads. Although algal blooms can occur naturally, typically the most problematic algal blooms are the result of human influences/ activities such as changes to water flows and the introduction of excessive nutrients. Problematic and often harmful human-induced algal blooms pose a significant threat and can result in economic and social impacts (increase in water supply treatment costs, need to use alternate supplies, loss of oyster production, disruption of waterway usage). Furthermore harmful algal blooms can seriously affect the health of aquatic ecosystems, as they tend to reduce the ability of aquatic plants to photosynthesise and reduce the amount of oxygen in the water. This can lead to the death of aquatic plants and animals (eg. fish kills).

Within the Great Lakes region algae blooms occur in both fresh and salt water often as a result of natural or seasonal events but also due to human impacts. Algae blooms provide an indication of the increased pressure placed on our natural waterways.

Monitoring

The management and reporting of algal bloom events prior to June 2004 was the responsibility of the then DIPNR. Following the disbandment of the governing committee, reporting responsibilities have since shifted to Local Government. Council's Environmental Health section has the responsibility for investigating and recording algal bloom events within the Great Lakes LGA.

These are generally detected through visual observation and reports from the community. Following detection of a bloom event, a Council Officer inspects the bloom, collects samples for analysis and records the species type and describes its location and extent. Council officers then monitor the bloom weekly and record its duration and spread on a Geographical Information System (GIS).

Information on algal blooms is also received from relevant government agencies, including the Department of Environment, Climate Change & Water (DECCW) – Parks and Wildlife Division (which is particularly relevant to the ongoing issue of Blue-Green Algae outbreaks in Myall Lakes).

Results

No algae blooms were reported by Council's Environmental Health Section, DECCW (National Parks) or DECCW (Environment Line) for this reporting period.

Table 3.3.1: Number of algae bloom events

Year	No. of Algae Bloom Events	Description of Bloom- where applicable
2004/05	0	
2005/06	1	DECC (National Parks) reported an algae bloom of Anabaena, Microcystis and associated species in the Bombah Broadwater and the two Myall Lake systems within the Myall Lakes National Park. Biovolumes across the sampling areas were not sufficient to trigger a high alert.
2006/07	0	
2007/08	0	
2008/09	0	

Source: Great Lakes Council, Department of Environment and Climate Change

Summary

Of greatest concern, are algal blooms driven by human causes or land use-pressures. For example, farming practices in the upper Myall catchment can result in excess nutrient levels in the Myall Lakes as these nutrients are carried down by the Myall River.

Figure 16. Algae food (such as nitrogen) can be reduced by improving farming management practices, such as fencing cattle out of creeks

Trend Analysis

The occurrence of algal blooms across the LGA has been insignificant, there has been no trend analysis performed on this data.

Response and Future Directions

As part of the Great Lakes Coastal Catchments Initiative a Water Quality Improvement Plan for the Great Lakes has been prepared. This plan is based on the latest computer modelling of the ability of the lakes to deal with sediment and nutrients from the catchment. The plan will also incorporate a review of Current Management Practices and evaluate which on-ground works are most effective to be implemented and where in the catchments these are most needed.

3.4 Fish Kills

Introduction

The term “fish kill” applies to the localised and specific death of a number of fish or associated marine or aquatic species, such as prawns and crabs. Fish kills may occur in marine, estuarine and inland waters and usually take place in a defined area over a defined period of time. Fish kills are typically (but not always) a result of human activities and especially actions that lead to declining environmental conditions such as low dissolved oxygen levels, pH stress, changes in water temperature and toxic pollution. False fish kills may result from throwbacks of dead fish from commercial fishing vessels.

Although currently not a common event within the Great Lakes, there is the potential for fish kill events to become more prevalent as development impacts increase. Unless these impacts are managed appropriately the regions fish stocks may be seriously depleted. Fish kills tend to be indiscriminate and can remove whole populations or specific recruitment/ breeding classes.

Monitoring

Council’s Environmental Health section maintains records on fish kill events within the LGA. When a fish kill occurs, Council Officers or appropriate agency staff (DPI- Fisheries) conduct an investigation and record detail of the location, extent, species affected and possible cause(s). Council also completes an investigation report, which is forwarded to the Department of Primary Industries (Fisheries). Hence, there is often relatively detailed information on the number and extent of fish kills, including the number of individuals, affected species, location and extent. The DPI (Fisheries) office located at Huskisson also maintains records, which are sourced for the purpose of SoE reporting.

Results

In August 2008 the Department of Primary Industries reported a fish kill in the Myall Lakes. The exact numbers in the fish kill are not known but at the time of investigation 20 fish were observed. Initial reports referred to hundreds of fish being affected and it is suspected that some may have been eaten by other fish or pelicans. There were five species affected in the kill: Bream, Silver biddy, Whiting, Luderick, Mullet. Specimens were collected to perform autopsies and it was found that epidermal necrosis, profound infiltration and tissue necrosis associated with mats of fungal pseudohyphae. In other words the fish had ‘Winter Disease’ or Saprolegniosis which is a consequence of prolonged low salinity and cold temperatures.

Table 3.4.1: Number of Fish Kill events

Year	No. of Fish kill Events
2004/05	0
2005/06	0
2006/07	0
2007/08	1
2008/09	1

Source: Great Lakes Council & DPI (Fisheries)

Summary

The only fish kill recorded was a result of 'Winter Disease' in the Myall Lakes.

Trend Analysis

Over the past 5 reporting periods there have been only 2 fish kills recorded, with the two being recorded only in the last 2 years. Both have been isolated, localised and quickly controlled events. Both events were a result of prolonged undesirable weather that caused mortality.

3.5 Stormwater Pollution

Introduction

Stormwater pollution is a major environmental issue within the Great Lakes LGA and unless managed and properly addressed can have long-term negative impacts on the health of local waterways. Stormwater pollution is generated during rain events as the water collects pollutants (sediment, organic matter, chemicals, litter, fertilisers, etc) before washing into stormwater drains and street gutters and/ or entering local waterways. Stormwater pollution impacts on aquatic plants and animals, the aesthetics of local waterways and potentially human health.

Figure 17. Pioneer constructed wetland - designed to remove pollutants before draining into Wallis Lake

Council has installed structural solutions in parts of the LGA to reduce the amount of pollutants entering local waterways. In total, 11 constructed wetlands, eight Gross Pollutant Traps, 251 litter baskets and three Nicholas Ski Jumps have been commissioned. Monitoring the quantity of pollutants captured within these water quality improvement devices gives an indication of stormwater pollution pressures within certain sub-catchments.

Monitoring

For most of the structures listed above staff monitor the quantities of pollutants captured by recording information during routine maintenance works. Information recorded includes the total weight of pollutants as well as the approximate percentage of material composition of sediment, litter and organic material captured in each device. The frequency at which maintenance works are conducted influences

the frequency of data collected. Litter baskets are typically cleaned out once every month. GPTs and wetlands are typically maintained on a needs basis, (however some of these structures have not been allocated regular funding for this to occur).

Results

The monitoring results for this indicator take into consideration pollutants captured during routine maintenance clean-outs of structural solutions including litter baskets, GPTs and Nicholas ski jumps.

In total 24 764.5 kg of pollutants were captured in Councils structural solutions during the reporting period. This is a dramatic increase from last years result of 2980.5 kg. However this could be a reflection of a breakdown in the reporting procedures rather than an increase in the amount of pollutants generated.

Over the years there has been major inconsistencies in the regularity of the reporting of cleanouts, and the useability of the data that is reported on. In many cases some of the cleanouts do not get reported, and the data received is generally not suitable for quantifiable reporting such as this.
However for the purposes of this process all of the quantifiable data that was received will be reported on.
A break down of the devices installed and the type of pollutants captured is provided below.

Litter Baskets

Table 3.5.1 Litter Basket clean out data

	2004-05	2005-06	2006-07	2007-08	2008-09
Forster Litter Baskets	(45 baskets)	(86 baskets)	(88 baskets)*	(88 baskets)	(88 baskets)
TOTAL (kg)	**1371**	**1122**	**1205**	**691**	**1121**
Average proportion of Sediment	55%	53%	55%	59.5%	59%
Average proportion of Leaves	0%	0%	0%	0.5%	0.5%
Average proportion of Litter	45%	47%	45%	40%	40.5%
Nabiac Litter Baskets		(10 Baskets)	(10 Baskets)*	(10 Baskets)	(10 Baskets)
TOTAL (kg)	**343**	**296**	**137**	**73**	**154**
Average proportion of Sediment	50%	65%	75%	77%	77%
Average proportion of Leaves	0%	0%	0%	0%	1%
Average proportion of Litter	44%	35%	25%	23%	22%
Stroud Litter Baskets		(17 Baskets)	(17 Baskets)	(17 Baskets)	(17 Baskets)
TOTAL (kg)	**1120**	**1138**	**1274**	**1123.5**	**916.5**
Average proportion of Sediment	55%	26%	39%	67%	40.5%
Average proportion of Leaves	38%	70%	54.5%	30.5%	58.5%
Average proportion of Litter	8%	4%	6.5%	2.5%	1%
Tuncurry Litter Baskets		(23 Baskets)	(23 Baskets)	(23 Baskets)	(23 Baskets)
TOTAL (kg)	**570**	**471**	**361**	**241**	**454**
Average proportion of Sediment	45%	56%	56%	57%	55%
Average proportion of Leaves	0%	0%	0%	0%	6%
Average proportion of Litter	59%	44%	44%	43%	39%
Hawks Nest Litter Baskets	(19 Baskets)		(19 Baskets)	(19 Baskets)	(19 Baskets)
TOTAL (kg)	**600**	**No data**	**811**	**50**	**No Data**
Average proportion of Sediment	90%	No data	34%	0%	No Data
Average proportion of Leaves	8%	No data	56%	100%	No Data
Average proportion of Litter	2%	No data	10%	0%	No Data
Tea Gardens Litter Baskets	(25 baskets)		(94 baskets)**		

TOTAL (kg)	**400**	**No data**	**1500.5**	**250**	**550**
Average proportion of Sediment	90%	No data	44%	36%	50%
Average proportion of Leaves	9%	No data	44%	64%	0%
Average proportion of Litter	1%	No data	12%	0%	50%
Grand Total (kg)	**3404**	**3027**	**5288.50**	**2430.5**	**3195.5**

Notes: * Some baskets in these areas were broken or missing during the reporting period
** Only 37 baskets in Tea Gardens were maintained during the reporting period

Source: Great Lakes Council

In total 3195.5 kg of sediment, litter and organic matter was reported to be removed from 180 litter baskets that were maintained within Forster, Tuncurry, Nabiac, Hawks Nest, Tea Gardens and Stroud during the reporting period. It should be noted here that as for all other reporting periods, the data reported for the 2008/09 period is incomplete and the data represented here indicates only the information that has been received.

The amount and type of pollutants collected vary depending on location. However, this could be due to differing maintenance schedules and reporting methods.

Gross Pollutant Traps (GPT)

Of the 5 gross pollutant traps that are in the Great Lakes, there was one GPT reported as being cleaned out during this reporting period. There was 15 000kg removed from the Little Street GPT. This is quite a significant amount, and shows a clear need for regular cleaning of these larger pollutant traps.

Table 3.5.2: Total amount of pollutants removed from Council's Gross Pollutant Traps located in Little St and Condell Pl, Forster

	2004/05	2005/06	2006/07	2007/08	2008/09
Condell Place GPT				No data	No data
Total pollutants removed (kg)	**0**	**33000**	**11000**	**No data**	**No data**
Average proportion sediment	0%	70%	40%	No data	No data
Average proportion gravel	0%	10%	10%	No data	No data
Average proportion leaves	0%	10%	40%	No data	No data
Average proportion litter	0%	10%	10%	No data	No data
Little Street GPT					
Total pollutants removed (kg)	**3500**	**14000**	**13000**	**No data**	**15000**
Average proportion sediment	60%	60%	50%	No data	30%
Average proportion gravel	0%	10%	10%	No data	20%
Average proportion leaves	30%	5%	22.5%	No data	30%
Average proportion litter	10%	25%	17.5%	No data	10%
Other	n/a	n/a	n/a	n/a	10%

Source: Great Lakes Council

Figure 18. Gross Pollutant Traps, like the one in Little St, remove large debris

Nicholas Ski Jumps

In total 6569 kg of pollutants were removed from 5 Nicolas Ski Jumps located in the LGA. A breakdown of the material collected is provided in Table 3.5.3

Table 3.5.3: The total quantity of pollutants removed from gross pollutant traps (GPT) during two clean out periods

	2004/05	2005/06	2006/07	2007/08	2008/09
Patsy's Flat North Ski Jump					
TOTAL pollutants removed (kg)	**700**	**900**	**950**	**250**	**805**
Average proportion sediment	3%	5%	20%	10%	10.8%
Average proportion gravel	35%	20%	40%	10%	18.7%
Average proportion leaves	55%	17%	25%	70%	60.9%
Average proportion litter	1%	53%	10%	5%	5%
Patsy's Flat South Ski Jump					
TOTAL pollutants removed (kg)	**920**	**1040**	**1110**	**300**	**3300**
Average proportion sediment	5%	5%	30%	30%	12.4%
Average proportion gravel	18%	17%	40%	10%	51.3%
Average proportion leaves	73%	23%	17.5%	50%	30.1%
Average proportion litter	1%	50%	7.5%	5%	5%
Kularoo Ski Jump					
TOTAL pollutants removed (kg)	**700**	**400**	**1050**	**No data**	**904**
Average proportion sediment	19%	7%	30%	No data	10.6%
Average proportion gravel	10%	13%	35%	No data	15.6%
Average proportion leaves	61%	40%	22.5%	No data	63.2%
Average proportion litter	6%	37%	7.5%	No data	5.9%
Pioneer Drive No. 1					
TOTAL pollutants removed (kg)	**No data**	**No data**	**No data**	**No data**	**783**
Average proportion sediment	No data	No data	No data	No data	62.4%
Average proportion gravel	No data	No data	No data	No data	354.9%
Average proportion leaves	No data	No data	No data	No data	279.9%
Average proportion litter	No data	No data	No data	No data	63.3%
Pioneer Drive No. 2					
TOTAL pollutants removed (kg)	**No data**	**No data**	**No data**	**No data**	**777**
Average proportion sediment	No data	No data	No data	No data	12%
Average proportion gravel	No data	No data	No data	No data	45%
Average proportion leaves	No data	No data	No data	No data	26%
Average proportion litter	No data	No data	No data	No data	14%
Grand Total	**2320**	**2340**	**3110**	**550**	**6569**

Source: Great Lakes Council

Constructed Wetlands

No data has been collated for the cleaning of constructed wetlands for this reporting period as no data in this regard has been supplied from the Councils Tuncurry works depot. Further investigation is required to successfully access data for future SoE reports. This may require the establishment of a more formal protocol and working partnership to be implemented for subsequent reporting periods.

Summary

It is very difficult to make any conclusions as to the amount of pollutants removed due to issues with reporting. Regardless of this, these structures do not prevent the cause of stormwater pollution, instead they only treat the result of this environmental issue.

Ultimately a decrease in the amount of pollutants over subsequent years would be ideal and serve as an indication of a decline in the amount of pollutants being generated in the catchment and entering the stormwater systems. This requires both behavioural change and adoption of best management practices.

Trend Analysis

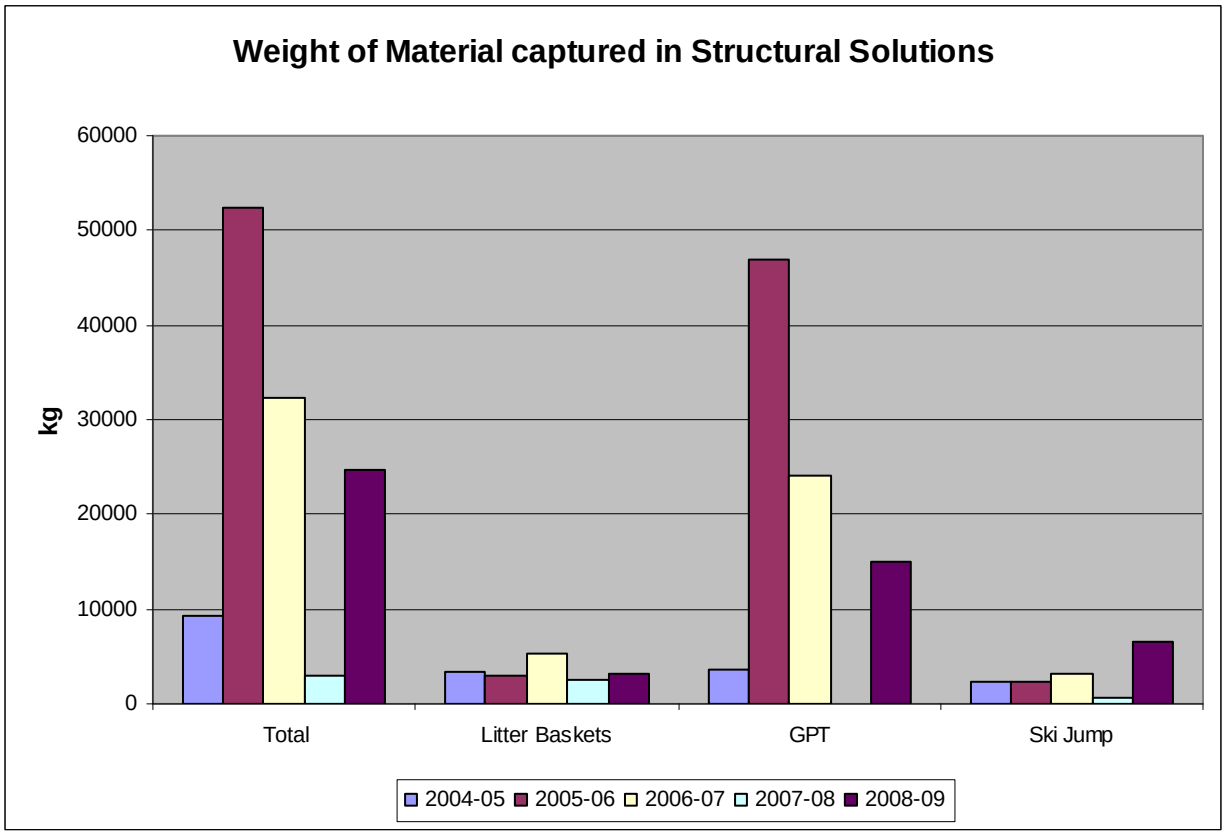


Figure 19. The total amount of pollutants captured by all of Councils structural solutions eg. GPT's, Nicholas Ski Jumps and Litter Baskets

The total amount of pollutants captured in Councils structural solutions varies significantly across all reporting periods. Figure 19 shows that there has been quite a large increase in the amount of pollutants captured (Total) between the 07-08 and 08-09 reporting period.

Figure 19 also shows the large variation in the amount of pollutants captured over the entire reporting period, with the period 2007/08 reporting 'Nil'. This is likely to be due to neither of the GPT's being

cleaned out during that period, rather than the lack of pollution entering the systems. It is difficult at this stage to determine if this is because of the increase in pollutant generation, or the lack of data collection for the previous reporting period. This isn't a true representation of all pollutants captured as the reporting mechanisms are flawed. Due to this, performing meaningful trend analysis on this data is quite difficult.

However it is important to note here that from Figure 19, it can be seen that majority of pollutants (quantifiable) that are removed from Councils structural solutions are from the Gross Pollutant Traps. This means that there should be a focus on regular cleaning of these structures.

Response and Future Directions

Education has been identified as an essential tool in reducing the quantity of stormwater pollution. Subsequently, Council has developed an education and awareness program to target stormwater pollution. Developed in 2001, the Healthy Lakes Program has been successful in raising awareness and educating the local community on a number of water quality issues. However, education needs to be ongoing in order to be effective. It also needs to lead to actual behavioural change and positive actions.

It is also recommended that regular cleaning of GPT's should occur across the LGA.

Table 3.5.4 Identified Needs for Action Regarding Stormwater Pollution

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Develop pollutant trap and litter basket cleaning, monitoring, performance assessment and reporting procedures	• Improve performance and management of stormwater treatment devices • Review and Improve cleanout reporting procedures	Natural Systems, Engineering Services	Y	Within 2yrs
Develop a constructed wetland cleaning and reporting procedure and allocate funding to improving the efficiency of one constructed wetland each year	• Improve performance and management of stormwater treatment devices	Natural Systems, Engineering Services	Y	Immediate
Continue implementation and expansion of Healthy Lakes Program	• Healthy Lakes Program (continue and expand initiatives)	Natural Systems	Y	Ongoing

3.6 Fish Passage Barriers

Introduction

A fish passage barrier is an obstacle that prevents fish from moving either upstream or downstream and can include structures such as dams, weirs, floodgates, roads, bridges, causeways and culverts. The natural behaviour of most native fish species requires the ability to move at least some distance and when restricted by the presence of a barrier these migrations are restricted or curtailed. Barriers can have the following effect on native fish species:

- restrict migration of fish for spawning;
- reduce dispersal of juvenile fish;
- create isolated populations and reduce gene flow between fish populations;
- limit passage of fish between feeding grounds;
- cause fish to congregate at a barrier leaving them open to over-fishing, disease or predators;
- create unsuitable living or breeding conditions (leading to fish kills);
- cause the extinction of upstream or downstream migrating species; and
- alter species diversity because of the local disappearance of some species and changes to the abundance of remaining species.

There is increasing knowledge on the means to modify existing barriers to reduce their impact. For example, modifications of openings, crest levels and the installation of Fishways/ ladders have been utilised successfully. Fishways can provide essential passage through or around barriers, reduce the energy of water flow and decrease stress to fish. Fishways can range from simple rockramps on small weirs to powerful lifts and locks on large dams. Department of Primary Industries (DPI) -Fisheries can provide information on options for building fishways. Further, some structures that act as barriers are no longer operational or are obsolete. Depending on associated environmental issues, barriers such structures, should be removed.

Monitoring

Under the *Fisheries Management Act 1994*, proposals that obstruct the free passage of fish; or require construction or modification of a dam, weir or floodgate; must be referred to DPI (Fisheries) for comment to determine whether a fishway is required. Further, DPI (Fisheries) Port Stephens Research Centre maintains a record on the number, type, location and extent of some of the fish passage barriers within the LGA. However, this database is not comprehensive. There is no detailed catalogue of the type, nature, location and significance of fish barriers throughout the Great Lakes LGA. Recently, the DPI has produced a report to the NSW Environmental Trust titled “Reducing the impact of road crossings on aquatic habitat in coastal waterways- Hunter/Central Rivers, NSW”. In this report a number of additional causeway barriers have been identified in our LGA and these have been included in the results for this indicator.

Results

23 fish passage barriers have been identified to date within the Great Lakes LGA. These are listed bellow.

Table 3.6.1: Fish passage barriers

Location	Structure Name	Type of Structure
Wallamba River	Farm Dam	Over/Shot Dam
Bundacree Creek	Farm Dam	By/Wash Dam
Khoribakh Creek	Farm Dam	Over/ Shot Dam
Bundageree Creek	Unnamed dam (Nabiac)	Fixed crest dam/weir
Bangalow Creek	Bangalow Road	Causeway
Cromarty Creek	Private Road off Lemon Grove Road	Causeway
Booral Creek	Conger Road	Causeway
Booral Creek	Blue Gum Road	Causeway
Karuah River	Cherry Tree Road	Causeway
Telegherry River	Moores Creek Road	Causeway
Sugarloaf Creek	Private road off unnamed road off The Bucketts Way	Causeway
Mammy Johnson River	Tereel Road	Causeway
Telegherry River	Middle Road	Causeway
Coolongolook River	Locketts Crossing Road	Causeway
Curreeki Creek	Private Road off Curreeki Road	Causeway
Curreeki Creek	Private Road off Curreeki Road	Causeway
Curreeki Creek	Curreeki Creek Road	Causeway
Curreeki Creek	Curreeki Creek Road	Causeway
Curreeki Creek	Curreeki Creek Road	Causeway
Curreeki Creek	Curreeki Creek Road	Causeway
Wang Wauk River	Smedleys Cutting Road	Causeway
Lawless Creek	Cherry Tree Road	Ford
Penenton Creek	Macintosh St Forster	Floodgate

Source: NSW Department of Primary Industries (Fisheries NSW), GLC

Last years SoE reported 24 fish passage barriers whilst this year reports 23 barriers. The lower number this year does not indicate removal of barriers, however it shows that last years report had included a barrier that had previously been remediated (Bulahdelah Weir).

This in fact means that there has been no fish passage barriers removed or remediated in the last reporting period.

Figure 20. Modifications to the Stroud Water Supply Weir to allow fish movement. Source: DPI (Fisheries)

The fish passage barriers identified in Table 3.6.1 are unlikely to be the only structures of this nature within the Great Lakes LGA. There are likely to be other barriers to fish passage, particularly located on private land.

Trend Analysis

As there has been virtually no change in the amount of fish passage barriers in the Great Lakes LGA, there will be no trend analysis performed for this indicator.

Summary and Response

Over time it is hoped that progress on removing fish passage obstructions can be achieved in a prioritised and strategic manner. The work currently being done by Fisheries /DPI will greatly assist in this undertaking as resources for this area is very limited.

The significant barriers identified in Table 3.6.1 will continue to impact natural processes unless they are redesigned to allow for fish passage and the restoration of natural flows. Environmentally it would be ideal to remove all barriers however this poses a number of social and economic concerns as some of these barriers facilitate access, irrigation weir pools or domestic water supply. As such, the environmental, economic and social cost of management actions needs to be inherently considered.

Table 3.6.2 Identified Needs for Action Regarding Fish Passage Barriers

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Extensive ground truthing to comprehensively identify fish passage barriers with in the Great Lakes LGA	Work with other agencies to remediate Fish Passage Barriers	Natural Systems	N	Within 2yrs
Strategic removal/remediation of obstructions identified, in association with relevant authorities (DPI, CMA).	Work with other agencies to remediate Fish Passage Barriers	Natural Systems	N	Within 5yrs

4 Biodiversity

The Great Lakes supports a variety of unique landscapes and vegetation communities as well as a diversity of plants and animals. The local economy relies heavily on tourism and primary production, which depend upon a healthy and functioning environment. Therefore, the conservation of the regions' biodiversity is critical.

Figure 21. Biodiversity refers to the variety of species, individuals and landscapes in an area

It is increasingly recognised that the natural environment performs essential biological and ecosystem services such as water quality protection. However, human impacts are placing an increased pressure on the variety of species present and the integrity of habitats within the LGA. Land development and clearing particularly are significant threats to our native plants and animals. Unless these impacts are managed appropriately the extent of biodiversity currently present in the region will decrease. Ultimately this will impact on the economy, the wellbeing of residents as well as the regions' aesthetics and general appeal.

4.1 Native Vegetation

Introduction

Figure 22. Important vegetation - a healthy and functioning riparian zone on the Cureeki Creek, Coolongolook

The extent and integrity of natural vegetation is, along with water quality, the most important environmental indicator for the Great Lakes LGA. Adequate native vegetation representation across the LGA is associated with significant direct and indirect environmental benefits, along with a range of socio-economic opportunities and values. Conversely, the degradation of native vegetation beyond appropriate thresholds is known to result in significant declines in biodiversity, water quality, land quality (eg. salinity, rising watertables, erosion), and subsequently affect land productivity and critical social and economic resources. It has been demonstrated that vegetation decline can impinge seriously on attributes of the landscape that underpin the sustainability and viability of the entire Great Lakes area and permanently alter the values that the community regard as being important. Land clearing also worsens the carbon balance and contributes to global warming.

Monitoring

No comprehensive, detailed accurate and appropriately-scaled account of the vegetation of the entire Great Lakes LGA has been collated. In 2003, mapping of vegetation communities was produced by Council for the eastern half of the LGA, but this mapping has been subsequently determined to be of limited scale and accuracy to assist local-scale, on-ground decision-making. Consequently, it is a priority to undertake vegetation community description and mapping across the LGA and processes and methods are being implemented in this regard.

With regards to vegetation change, no agency has collated a base map of vegetation of the LGA and no agency routinely monitors rates of vegetation change in a meaningful manner. However, these are both critically important to strategic, proactive and integrated natural resource management and biodiversity conservation. Council intends to address this deficiency through a defined vegetation monitoring protocol to be implemented as part of subsequent SoE reporting processes.

A secondary component of this indicator requires that Council monitor and report on approved native vegetation clearing operations within the LGA. This includes native vegetation cleared under approval through the Hunter Central Rivers Catchment Management Authority under the *Native Vegetation Act* 2003, clearing under approval through the DECCW or clearing by Council under the *Environmental Planning and Assessment Act* 1979. This indicator also includes vegetation (both native and exotic) cleared and replaced through Council's Tree Preservation Order.

Finally, the issue of unauthorised clearing is also considered and reported on. This is restricted to an analysis of the number of breaches investigated by Department of Environment, Climate Change and Water.

Results

Until a formal protocol for local vegetation mapping and monitoring is developed, data from Hunter REMS regional mapping project is all that will be provided as an overall indicator of the extent of vegetation in the LGA.

Table 4.1.1 Extent of vegetation across Great Lakes LGA

LGA	LGA area (ha)	Veg (ha)	% Veg
Great Lakes	**337414**	**243929**	**72.29**

Source: Hunter REMS 2006

Information has been sourced from the Catchment Management Authority regarding clearing approved under the *Native Vegetation Act 2003* within the Great Lakes LGA for the SoE reporting period. This information was provided by the Department of Natural Resources previously, but this department has since been dissolved.

Table 4.1.2: Clearing of Native Vegetation Consents by DNR/ CMA and DECC

Clearing Type	04/05 (ha)	05/06 (ha)	06/07 (ha)	07/08 (ha)	08/09 (ha)
Clearing	2.57	0	0	0	0
Silvicultural/ Selective Logging/ Private Native Forestry	2,535.87	308.22	677.67	No data	No data
TOTAL	**2,538.44**	**308.22**	**677.67**	**-**	**-**

Source: Department Natural Resources (pre2006), Catchment Management Authority, Department of Environment and Conservation

The table above shows a dramatic reduction in clearing over the three reporting periods. This is largely a reflection of the change in legislation that occurred over the reporting period.

The number of trees removed and replaced through Council's Tree Preservation Order is as follows:

Table 4.1.3: Trees removed and replaced through TPO and Greening Strategy process

Year	2004/05	2005/06	2006/07	2007/08	2008/09
Number trees removed	No data	539	510	507	510
Number native	No data	341	270	229	230
Number trees refused removal	No data	179	240	304	298
Number planted as offset	No data	114	480	721	703

Source: Great Lakes Council

In relation to clearing associated with developments approved by Great Lakes Council, some **6.93 hectares** of native vegetation was cleared during the reporting period, as shown by the table below.

Table 4.1.4 Clearing of Native Vegetation associated with DA Referrals

Clearing of Native Vegetation associated with DA Referrals	2004/05	2005/06	2006/07	2007/08	2008/09
Littoral Rainforest*	0.00ha	0.00ha	0.07ha	0.00ha	0.03ha
Cabbage Palm Forest	0.00ha	0.00ha	0.00ha	3.54ha	0.00ha
Lowland or Riparian Forest*	0.00ha	0.20ha	0.13ha	0.00ha	0.00ha
Swamp Mahogany Swamp Forest	0.00ha	0.00ha	0.12ha	0.39ha	0.02ha
Swamp Mahogany/ Paperbark Swamp Forest*	0.05ha	0.15ha	2.78ha	0.39ha	0.00ha
Broad-leaved Paperbark Swamp Forest*	0.06ha	0.00ha	0.00ha	5.61ha	0.00ha
Swamp Oak Swamp Forest*	0.00ha	2.77ha	0.10ha	0.10ha	0.00ha
Swamp Oak/ Paperbark Swamp Forest*	0.40ha	0.05ha	0.00ha	0.00ha	0.00ha
Blackbutt Grassy Open Forest	2.40ha	7.73ha	0.06ha	0.07ha	0.23ha
Blackbutt Coastal Sands Open Forest	3.70ha	0.00ha	0.80ha	5.74ha	0.83ha
Blackbutt/ Broad-leaved Paperbark Forest	0.00ha	1.44ha	0.00ha	0.00ha	0.00ha
Blackbutt/ Flooded Gum Moist Forest	0.00ha	0.00ha	0.00ha	0.00ha	0.62ha
Blackbutt/ Tallowwood Open Forest	4.50ha	0.50ha	1.27ha	0.13ha	0.44ha
Tallowwood Moist Open Forest	0.00ha	0.00ha	0.00ha	0.05ha	0.05ha
Tallowwood/ Grey Gum Dry Open Forest	0.00ha	0.48ha	1.88ha	1.09ha	0.06ha
Flooded Gum or Flooded Gum/ Tallowwood Moist Forest	0.00ha	0.50ha	0.01ha	0.04ha	0.00ha
White Mahogany/ Grey Ironbark/ Grey Gum Dry Open Forest	0.00ha	1.99ha	5.03ha	1.82ha	0.00ha
Grey Gum Dry Open Forest	0.00ha	0.14ha	0.00ha	0.00ha	0.00ha

Red Mahogany/ Broad-leaved Paperbark Swamp Forest*	0.00ha	1.40ha	0.00ha	0.00ha	0.00ha
Stringybark Open Forest	0.00ha	0.00ha	0.00ha	0.50ha	0.00ha
Spotted Gum Open Forest/ Woodland	0.00ha	0.00ha	0.80ha	0.00ha	0.00ha
Spotted Gum/ Ironbark/ Grey Gum/ White Mahogany Open Forest	44.40ha	21.16ha	1.75ha	2.82ha	0.61ha
Ironbark or Ironbark/ Forest Red Gum/ Spotted Gum Forest	3.00ha	0.09ha	0.33ha	0.70ha	0.50ha
Forest Red Gum Forest	0.85ha	0.00ha	0.06ha	0.72ha	1.46ha
Cabbage Gum/ Rough-barked Apple Open Woodland*	0.00ha	3.66ha	0.00ha	0.00ha	0.00ha
Smooth-barked Apple Open Woodland	0.00ha	0.50ha	1.00ha	0.84ha	0.08ha
Banksia	2.00ha	2.05ha	0.00ha	0.00ha	0.38ha
Scribbly Gum Open Forest	0.00ha	6.00ha	0.00ha	0.00ha	0.10ha
Red Bloodwood Open Woodland	27.00ha	0.00ha	0.00ha	0.00ha	0.00ha
Heathland	0.00ha	0.00ha	0.00ha	1.18ha	0.01ha
Coastal Grassy Headland*	0.00ha	0.22ha	0.00ha	0.00ha	0.00ha
Sand Ridge/ Dune	0.00ha	0.00ha	1.00ha	0.00ha	0.00ha
Mixed Open Forest/ Woodland Type	0.00ha	19.87ha	1.64ha	0.36ha	1.45ha
TOTAL	**88.36ha**	**70.90ha**	**18.83ha**	**26.09ha**	**6.93ha**

* Possible Endangered Ecological Community on the Threatened Species Conservation Act
Source: Great Lakes Council

Figure 23. The clearing and fragmentation of vegetation for development in Hawks Nest and Tea Gardens is the greatest threat to the local endangered koalas

Table 4.1.5 Numbers of Native Trees Cleared from DA Referrals in urban Hawks Nest/ Tea Gardens (of significance due to the endangered Koala population)

Numbers of Native Trees Cleared from DA Referrals in Hawks Nest/ Tea Gardens (of significance due to the endangered Koala population)	04/05	05/06	06/07	07/08	08/09
Blackbutt	34	8	19	30	14
Red Mahogany	6	0	0	0	0
Smooth-barked Apple	6	0	0	0	0
Red Bloodwood	6	6	0	0	0
Swamp Mahogany*	4	0	0	0	0
Bangalay*	2	1	0	0	0
Flooded Gum*	2	0	0	0	0
Spotted Gum	1	1	0	0	0
Broad-leaved Paperbark	0	0	5	0	0
TOTAL	**61**	**16**	**24**	**30**	**14**

* Preferred local Koala food tree species
Source: Great Lakes Council

Illegal or unauthorised clearing remains a key issue for Council and pertinent State authorities. Data from DECCW is presented in Table 4.1.6 which shows the number of breaches of the Native Vegetation Act 2003. However data has not been provided for the last three reporting periods.

Table 4.1.6 Breaches of Native Vegetation Act 2003

Year	04/05	05/06	06/07	07/08	08/09
No. of Breaches of NVC Act	5	9	No Data	No Data	No Data

Source: Department of Natural Resources/ Department of Environment and Climate Change

The details of the locations, areas and vegetation affected by these reported cases of illegal clearing were not reported to Council. There were also no details provided of the actions taken against illegal clearers.

Trend Analysis

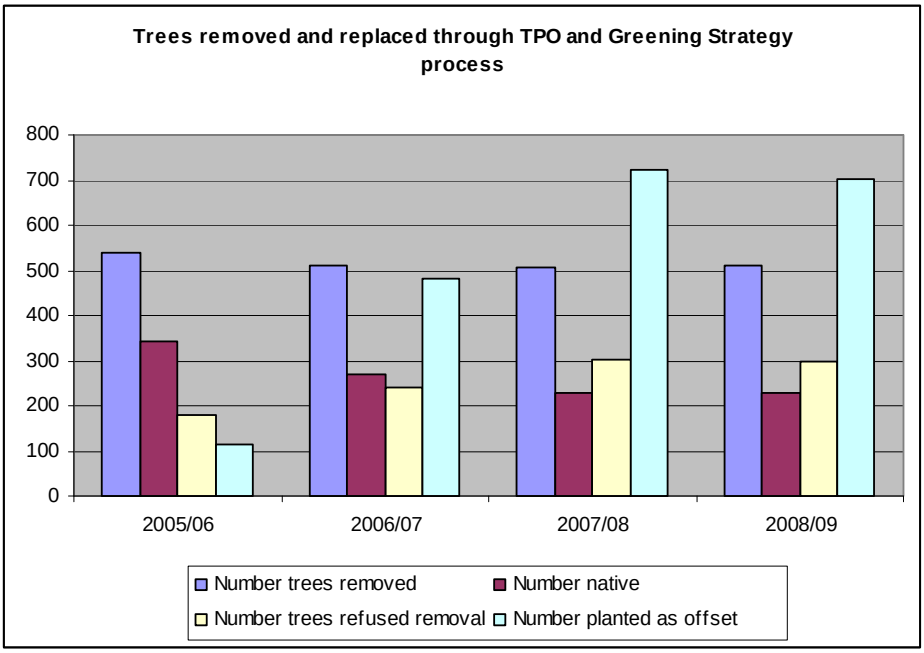


Figure 24. The number of trees removed and replaced through TPO and Greening Strategy process

Over the last 5 reporting periods there has been no significant change in the number of trees that have been removed as Figure 24 shows. However, the number of native trees that have been removed has decreased each year, whilst the number of refused tree removals has increased. A significant change which is also evident in Figure 24 is the number of trees that have been planted as offsets (almost 700% increase from 2005/06), which is pleasing to see.

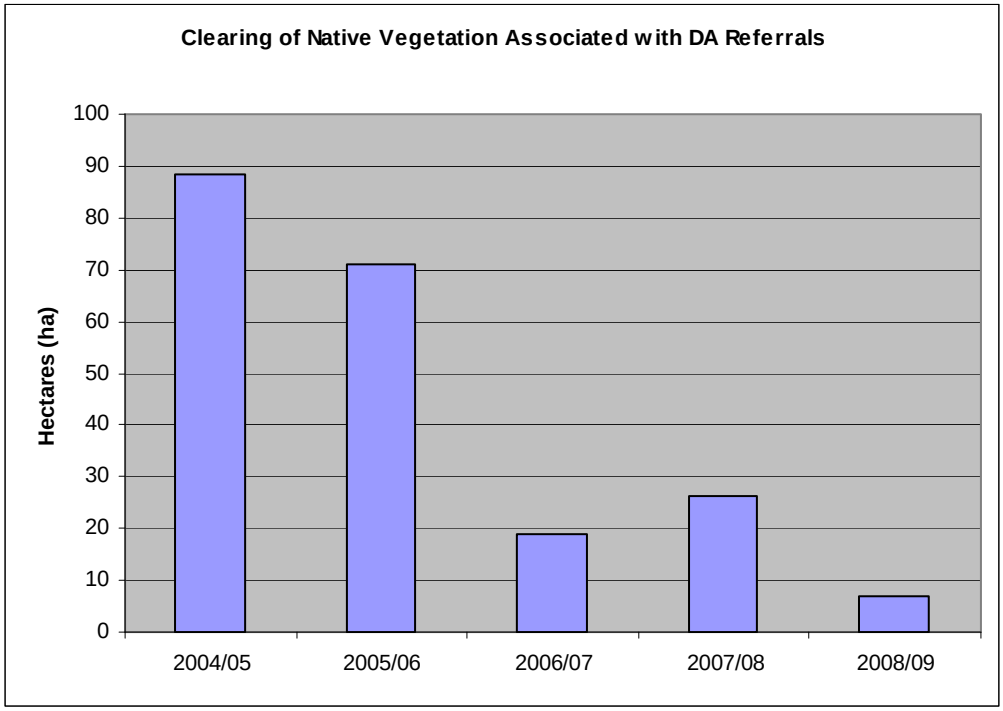


Figure 25. Clearing of native vegetation associated with DA referrals

It is also pleasing to see that there has been a significant decrease in the amount of approved clearing of native vegetation for development applications. In 2004/05 the area of native vegetation that was approved for clearing was 88.36 ha, whilst in the latest reporting period (2008/09) it was 6.93 ha.

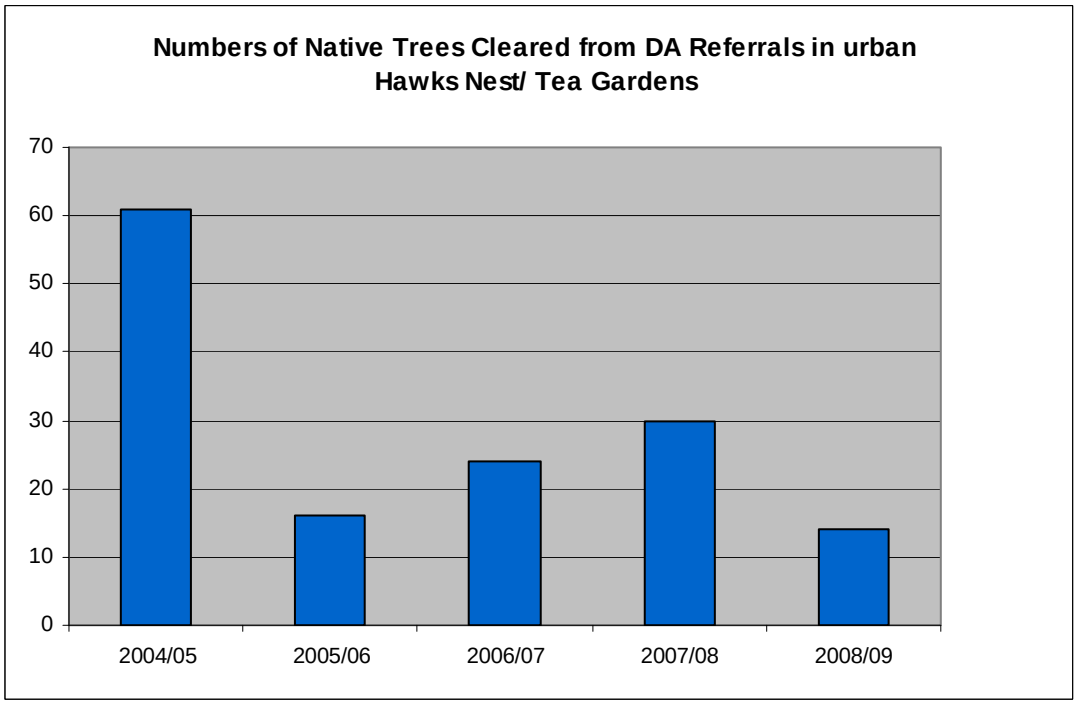


Figure 26. Number of native trees removed from Hawks Nest/Tea Gardens

The number of native trees removed from the Hawks Nest/Tea Garden area has also been reduced over the past 5 years (Figure 26).

Response and Future Directions

As stated in the previous SoE, it remains fundamental that Council, within its areas of influence, adequately manages, conserves and where required restores native vegetation and protects the landscape from any significant depletion of native vegetation representation across the LGA. Council must also recognise that in some localities and community types, native vegetation restoration is clearly very important. As such, Council should recognise and seek to achieve the directives of the *Native Vegetation Act 2003*, which include:

- Ending broad scale clearing unless it improves or maintains environmental values
- Protecting high conservation value vegetation
- Restoring and rehabilitating native vegetation

Great Lakes Council currently restores and replants native vegetation in association with Landcare, Coastcare, landholders, in Parks and Reserves and through street-scaping. It is hoped that these efforts can be reported in future SoE reports as an indication of Council's response to pressures on Native Vegetation. Additionally, there is a need to develop policy to ensure that these restoration efforts are made equal to or in excess of the vegetation lost through the TPO and DA consent processes so that we see a net gain in Native Vegetation across the LGA rather than an ongoing or cumulative net loss.

The issue of native vegetation representation and extent in the Great Lakes LGA is one of the most fundamental and important indicators. However, the usefulness and accuracy of data is limited by several key and fundamental actions. These are a high priority for Council to address, and comprise:

- Mapping of the vegetation across full extent of the LGA such that a single picture of vegetation is accurately compiled in accordance with valid classification schemes and methods; and
- Development of resources and a protocol for monitoring vegetation change via analysis of imagery for each comprehensive SoE report.

Following collation of the baseline data of vegetation across the entire LGA, the Natural Systems and Estuaries Branch shall develop, exhibit, adopt and implement a Vegetation Strategy.

It is currently proposed that for every Comprehensive SoE (once every four years), Council shall obtain updated aerial photography or appropriate resolution satellite images for the entire LGA. This imagery shall be analysed both remotely and visually to identify where loss and changes to natural vegetation type, structure or extent have occurred. Ground-truthing would also be required. The vegetation mapping shall be updated on the basis of this investigation and a concise report shall describe the changes to vegetation type and extent over the four-year assessment period. This information is critical

in that it represents an LGA-wide analysis of cumulative change and may allow the identification of vegetation communities and localities suffering from the greatest clearing pressures.

The data generated would be useful for strategic and development assessment planning and contribute to conservation planning. It should be used to amend and adopt refined priorities through Council's Biodiversity Conservation Framework.

Figure 27. Coast Care volunteer planting native trees

Table 4.1.7 Identified Needs for Action Regarding Vegetation

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Complete vegetation mapping and description for the Great Lakes LGA	• Vegetation Strategy (refine, update and implement)	Natural Systems	Partial	Immediate
Compile and implement Vegetation Strategy	• Vegetation Strategy (refine, update and implement)	Natural Systems	Partial	Immediate
Develop a monitoring protocol and implement the monitoring of vegetation changes through satellite or aerial imagery and ground truthing	• Develop a Vegetation Monitoring Protocol	Natural Systems	Partial	Within 2yrs
Prepare and adopt a Biodiversity Conservation Strategy and Framework	• Biodiversity Conservation Framework (develop and adopt)	Natural Systems	Partial	Within 2yrs
Develop and expand biodiversity education initiatives and activities	• Biodiversity education (develop and expand initiatives)	Natural Systems	Partial	Ongoing
Devise and implement an effective DA assessment protocol that includes adequate conditions of consent, flora and fauna survey guidelines and development design	• Develop a policy/direction for Development Assessment advice	Natural Systems	Partial	Immediate
Create a Landscaping Code that reflects proposed outcomes of Council's Greening Strategy	• Develop Landscaping Code	Parks and Recreation	Partial	Immediate
Adopt a policy for Native Vegetation that addresses the wider objectives of the *Native Vegetation Act 2003*	• Vegetation Strategy (refine, update and implement)	Natural Systems	Partial	Immediate
Implement an LGA wide program of acquiring high resolution Satellite Imagery on a four yearly basis	• Acquire Satellite Imagery	Council wide	Partial	Immediate

4.2 Conserved Land

Introduction

Public and formal private conservation provides for the protection of biodiversity, the recovery of threatened species, the protection of scenic amenity, as well as a range of social, recreational, economic and educational/ scientific outcomes. Council, amongst other relevant agencies, is required to strive towards the achievement of a comprehensive, adequate and representative reserve system, under the NSW Biodiversity Strategy and the Australian Natural Heritage Charter.

In this regard, there is a need to monitor the extent, and guide with local knowledge, the strategic additions of land to the public conservation estate as well as privately conserved lands.

Monitoring

Great Lakes Council shall collate and maintain a map of conserved land throughout the LGA and differentiate between the conservation mechanisms that apply to such lands. Furthermore, Council shall review the additions of land to conservation during each reporting period. Such information shall contribute to strategic and targeted biodiversity conservation frameworks.

Figure 28. Landholders can place portions of their land under conservation agreement to help preserve biodiversity

There is a range of levels and security associated with the varying conservation instruments. This includes (at the most secure level), the public conservation estate (National Park, Nature Reserves, State Conservation Areas) and binding private land conservation instruments that are on-title and operate in perpetuity (VCA, Registered Property Agreement, Conservation Trust Agreement). At the lowest level of security, there are non-binding conservation agreements that apply to private landholdings. However, these can be altered or withdrawn at any time and provide no real security. As such, non-binding conservation is not considered in the overall summary of conserved lands.

Results

Tables 4.2.1: Conserved Land in the Great Lakes LGA
Land Conserved in the Public Conservation Estate (ha)

Land Conserved in the Public Conservation Estate (hectares)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
National Parks (7)	*63,081*	*63,081*	*63,760*	*66,494*	*66,499*
Myall Lakes National Park	47,493	47,493	48,178	48,178	48,183
Wallingat National Park	6,557	6,557	6,544	6,544	6,544
Ghin-Doo-Ee National Park	4,819	4,819	4,809	4,809	4,809
Barrington Tops National Park (part)	2,645	2,645	2,693	2,693	2,693
Karuah National Park	0	0	0	2,691	2,691
Booti Booti National Park	1,567	1,567	1,536	1,536	1,536
Gir-um-bit National Park	0	0	43	43	43
Nature Reserves (13)	*4,408*	*4,449*	*4,889*	*4,889*	*4,894*
Karuah Nature Reserve	2,758	2,758	2,743	2,743	2,743
Darawank Nature Reserve	575	575	776	776	776
Coolongolook Nature Reserve	198	198	202	202	202
Corrie Island Nature Reserve	164	164	164	164	164
Minimbah Nature Reserve	0	0	125	125	130
Smiths Lake Nature Reserve	0	24	24	24	24
Seal Rocks Nature Reserve	0	0	2	2	2
Bull Island Nature Reserve	0	1	1	1	1
Monkerai Nature Reserve	0	0	1	1	1
Island Reserves of Wallis Lake	-	-	-	-	-
Wallis Island Nature Reserve	473	473	586	586	586
Regatta Island Nature Reserve	102	102	111	111	111
Mills Island Nature Reserve	61	61	58	58	58
Yahoo Island Nature Reserve	47	47	51	51	51
Bandicoot Island Nature Reserve	30	30	29	29	29
Flat Island Nature Reserve	0	9	9	9	9
Durands Island Nature Reserve	0	7	7	7	7
State Conservation Areas (3)	*1835*	*1962*	*713*	*713*	*713*
Black Bulga State Conservation Area	1,554	1,554	516	516	516
Karuah State Conservation Area	281	281	71	71	71
Bulahdelah State Conservation Area	0	127	126	126	126
Council owned and managed Open Space- natural areas	No data	516	516	516	516
Land Acquired for Conservation (not gazetted) (11)	*774*	*863*	*599*	*655*	*773*
TOTAL	**70,098**	**70,871**	**70,476**	**73,267**	**73,395**

Source: DECC/ Great Lakes Council

Table 4.2.2 Land Conserved in Binding Private Land Covenants

Land Conserved in Binding Private Land Covenants (Hectares)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
DEC Voluntary Conservation Agreements (VCA) (1)	*40*	40	39.1	39.1	39
PVP Clearing Offset Area or Incentive Area	0	0	0	0	No data
CMA/ DIPNR Registered Property Agreements (14)	*496*	*496*	*496*	*496*	*496*
DEH Conservation Agreement (0)	-	-	-	-	-
Nature Conservation Trust Conservation Trust Agreement (0)	-	-	-	-	-
Acquisition by Conservancy Agencies (Australian Wildlife Conservancy, Bush Heritage Trust, Earth Sanctuaries, Birds Australia, etc) (0)	-	-	-	-	-
Community Title Conservation Lots (-)	*342*	*342*	*342*	*342*	*342*
S88B or s88E Instruments/ Covenants over Private Land for Conservation (-)	No data	No data	No data	No data	No Data
TOTAL	**878**	**878**	**877.1**	**877.1**	**877**

Source: DECC/ Great Lakes Council

Table 4.2.3 Land in Non-binding Private Land Covenants (hectares)

	04/05	05/06	06/07	07/08	08/09
DECC Wildlife Refuge (9)	7,203	8,199	8,199	8,199	No data
DECC Management Contract (0)	-	-	-	-	-
DECC Land for Wildlife (0)	-	-	-	-	-
CMA Management Contract (0)	-	-	-	-	-
TOTAL	**7,203**	**8,199**	**8,199**	**8,199**	**-**

Source: DECC

Table 4.2.4 Other Conservation (hectares)

	04/05	05/06	06/07	07/08	08/09
Critical Habitat Declarations (0)	0	0	0	0	0
SEPP14 Coastal Wetlands	12,999	12,999	12,999	12,999	12,999
SEPP26 Littoral Rainforest	167	167	167	167	167
Environmental Protection Zones (Great Lakes LEP zones 7a-f)	No data	11,318	11,757	11,833	11, 865
Marine Park Sanctuary zones	0	0	17,631	17,631	17,631

Source: DECC and Great Lakes Council

Table 4.2.5 Summary of Conserved Lands

Conservation Category	Binding Conservation (Public and private) Area (ha)	Binding Conservation Percentage of LGA (337,300ha)
2004/05	70,976-ha	21.04%
2005/06	71,749-ha	21.27%
2006/07	71,354-ha	21.15%
2007/08	74,144-ha	21.98%
2008/09	74,272-ha	22.02%

Summary and Future Directions

While there is a relatively accurate picture of the extent of conserved land in the LGA (which is presently 22.02% of the LGA), there is a very incomplete picture of the biodiversity that is present within the reported formal conservation areas of the LGA, which hinders the local analysis of the reservation status of individual species, vegetation communities and ecosystem types across the Council area. Further, the conservation estate is below the threshold level argued by some scientists, of 30%, and thus cannot be seen to be comprehensive, adequate or representative.

There are also some limitations concerning the completeness of the reported area of conserved land. This is due to the difficulties encountered in compiling and sharing data across a number of different government agencies and a range of different privacy and access provisions.

The SoE report has established the need for a Great Lakes Protected Area Network/ Strategy to be established to address these issues and to guide and report on additions to the conserved land estate over time. This group would also provide input to the wider Biodiversity Conservation Framework. Local Council is an appropriate agency to manage and administer the concept of a Protected Area Network for the LGA. Obviously, there are a range of other agencies and stakeholders also involved, including

the Hunter/ Central Rivers CMA and DECCW (who have responsibility for managing the public conservation estate). The Protected Area Network/ Strategy would enable wider data sharing and cooperation between these relevant conservation agencies and establish and pursue conservation mechanisms, areas and targets. The terms of this strategy should be established as part of the development of the SoE reporting process.

Table 4.2.6 Identified Needs for Action Regarding Conserved Land

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Identify, develop and implement a Great Lakes Protected Area Network and Strategy, in association with relevant agencies (CMA, DECC, DoP) to facilitate data sharing and strategic biodiversity conservation reference areas, mechanisms and targets.	• Great Lakes Protected Area Strategy (develop)	Natural Systems	Partial	Within 2yrs
Council conduct an audit of its land to identify, zone and manage all important Council bushland reserves for effective and appropriate conservation.	• Great Lakes Protected Area Strategy (develop)	Natural Systems/ Parks and Recreation	Partial	Immediate

4.3 Corridors

Introduction

Land use for the purpose of agriculture, urban development and many other changes to the natural environment has greatly reduced the amount of habitat available to wildlife. The fragments of natural vegetation that remain are often small and isolated from one another by open pasture or urban development. Such fragmentation can act as a significant barrier to wildlife movement. As most wildlife need to traverse the landscape when foraging, dispersing, recolonising or migrating, the availability of secure movement avenues of vegetation cover is very important. It is widely recognised that wildlife in a habitat 'island' may have insufficient area of adjacent habitat to forage in, or disperse along. This can lead to the vulnerability of some species to catastrophes such as disease and bushfire, and to gradual changes like inbreeding and variations in climate.

Habitat corridors, or strips of natural vegetation connecting 'island' habitats, have been identified as a means of re-connecting isolated populations. A system of corridor links is more likely to sustain wildlife populations throughout the fluctuations and catastrophes that they inevitably undergo. Thus, habitat corridors can increase the value of existing isolated habitats. Further, habitat corridors have a range of social and economic benefits.

Monitoring

The Department of Environment, Climate Change and Water (DECCW) has modelled fauna corridors across the north coast of NSW, including the Great Lakes LGA. This modelling provides the only current data pertaining to the identification and mapping of fauna corridors strategically across the LGA. This modelling did not consider non-forest species (e.g. wetland fauna) and was not responsive to land tenure and property boundaries. Also, as it has not been confirmed through detailed local analysis and refined, such data cannot realistically be adopted in its present form, but does constitute an important resource on which to base local or LGA wide corridor strategies and contribute to DA and strategic planning. The SoE process is important to monitor the progress in identifying, mapping and conserving/ restoring fauna corridors in a strategic and targeted manner across the LGA.

Results

The names of the 70 modelled corridors of the LGA that have been identified by DECCW have been published in the previous comprehensive SoE. There has been no specific further refinement or development of wildlife corridor knowledge, conservation or planning in the LGA since the publishing of the key regional corridors project. Consequently, no additional results can be provided for this SoE. It is hoped that works to refine and update this mapping for the highest priority corridors can be strategically commenced in the near future. This may include and/ or benefit from the technical assistance of the Hunter Councils Environment Division.

Summary & Future Directions

There is a need for Council, in combination with relevant agencies, to implement the appropriate scale revision of corridor studies and commence to implement a proactive, integrated corridor strategy. This might include refinement and mapping and ultimately involve restoration/ revegetation and private land conservation through incentives. Until such time as the key habitats and corridors program is refined and updated with a local emphasis and included in statutory plans, the information referred to in this indicator would remain advisory only. There is a clear need to resolve and consider local corridor planning programs across key areas of the LGA and for the highest priority corridor links, such as the Myall Lakes to Wallingat link.

Figure 29. Residential and development and clearing for agriculture leads to fragmentation of habitat vegetation

Table 4.3.1 Identified Needs for Action Regarding Corridors

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Develop and implement an integrated corridor strategy in partnership with relevant agencies to identify, zone, conserve, manage and where required restore and reinstate wildlife corridors in the LGA	• Great Lakes Protected Area Strategy (develop) • Vegetation Strategy (refine, update and implement)	Natural Systems	Partial	Within 2yrs

4.4 Noxious & Environmental Weeds

Introduction

Land invasion by weeds is one of Australia's most serious and expensive land degradation problems. A weed is generally characterised as a plant growing where it is not wanted or where it was not originally present. The more serious weeds in the Great Lakes LGA are considered as either weeds of national significance, environmental or noxious weeds. The term environmental weed refers to weeds that have the potential to effect the integrity of local bushland whereas noxious weeds are declared under the Noxious Weeds Act 1993, as any plant which causes serious economic loss to agriculture, or has a detrimental affect on humans, animals or the environment. A list of weeds of national significance has been published by the Australian Weeds Committee National Initiative.

The Noxious Weeds Act 1993 was reviewed and amended with the changes coming into force on 1 March 2006. A summary of the classes is as follows.

Class 1 noxious weeds are plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent. The plant must be eradicated from the land and the land must be kept free of the plant. It is an offence to sell, propagate or knowingly distribute these plants. Notifiable weeds-state prohibited plants.

Great Lakes Council has recently discovered several occurrences of the Class 1 weed Water lettuce (*Pistia stratiotes*) located in back yard ponds in the Failford/Darawank area.

Class 2 noxious weeds are plants that pose a potentially serious threat to primary production or the environment in a region to which the order applies and are not present in the region or are present only to a limited extent. The plant must be eradicated from the land and the land must be kept free of the plant. Notifiable weeds-regionally prohibited plants. No new occurrences of class 2 weeds have been detected.

Class 3 noxious weeds are plants that pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area. These weeds must be regionally controlled. The plant must be fully and continuously suppressed and destroyed. Great Lakes Council has recently discovered several occurrences of the Class 3 weed Broadleaf Pepper tree (*Schinus terebinthifolius*) at Forster, Tuncurry Failford and Darawank. A small infestation of Red lantana was detected in the Red Hill / Mayer's Flat area and several infestations of Salvinia (*Salvinia molesta*) have been identified at Failford, Darawank, Wootton and Minimbah.

Class 4 noxious weeds are plants that pose a threat to primary production, the environment or human and animal health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area. These are locally controlled weeds that are managed according to requirements

set out by Council. The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority.

Class 5 noxious weeds and their seeds are Notifiable weeds and are sale restricted. That is, it is an offence to sell, propagate or knowingly distribute these plants. One new occurrence of the class 5 weed Cabomba (*Cabomba caroliniana)* was detected at Tea Gardens and several new occurrences of Sagittaria (*Sagittaria platyphylla)* have been discovered in the Myall River. A list of weed species occurring in each class of the Noxious Weeds Act is available from Council or http://www.dpi.nsw.gov.au/agriculture/pestsweeds/weeds/noxweed

Monitoring

Weed management is the responsibility of Council's Noxious and Environmental Weeds Officer. Due to the dynamic and vast distribution of weed species Council is unable to measure weed distribution across the LGA in quantitative or numerical terms. For the purposes of State of Environment Reporting, Council's Weed Officer has estimated the distribution of noxious and significant environmental weeds, occurring in the LGA, based on field records and observations.

Results

Table 4.4.1 Noxious Weeds and their distribution in the Great Lakes LGA

Weed Species	Estimated Distribution
African Boxthom *Lycium ferocissimum*	Occasional & Localised
Alligator weed *Alternanthera philoxeroides* (WONS)	Occasional & Localised
Bathurst/Noogora/Californian/cockle burrs *Xanthium* spp	Common & Widespread
Bitou Bush *Chrysanthemoides monilifera* ssp *rotunda* (WONS)	Abundant & Localised
Blackberry Rubus fruticosus aggregate spp (WONS)	Common & Widespread
Bridal Creeper *Asparagus asparagoides* (WONS)	Occasional & Localised
Broadleaf Pepper Tree *Schinus terebinthifolius*	Occasional &Localised
Crofton Weed *Ageratina adenophora*	Common & Widespread
East Indian Hygrophila *Hygrophila polysperma*	Occasional & Localised
Giant Parramatta Grass *Sporobolus fertilis*	Common & Widespread
Giant Rats Tail Grass *Sporobolus pyramidalis*	Occasional & Localised
Green Cestrum *Cestrum parqui*	Occasional & Localised
Groundsel Bush *Baccharis halimifolia*	Occasional & Localised
Hygrophila *Hygrophila costata*	Occasional & Localised
Mother of millions *Bryophyllum* species	Occasional & Widespread
Pampas Grass *Cortaderia* spp	Occasional & Localised
Patersons Curse *Echium* spp	Occasional & Localised
Salvinia *Salvinia molesta* (WONS)	Occasional & Widespread
St. Johns Wort *Hypericum perforatum*	Occasional & Localised
Water Hyacinth *Eichhomia crassipes*	Occasional & Widespread
Water Lettuce *Pistia stratiotes*	Occasional & Localised

Table 4.4.2 Environmental Weeds and their distribution in the Great Lakes LGA

Weed Species	Estimated Distribution
African Olive *Olea europaea* ssp. *africana*	Occasional & Localised
Asparagus Fern *Asparagus aethiopicus*	Common & Localised
Asparagus Fern *Asparagus plumosus*	Occasional & Localised
Camphor Laurel *Cinnamomum camphora*	Common & Widespread
Cassia/ Senna *Senna pendula* var. *glabrata*	Common & Widespread
Cats Claw Creeper *Macfadyena ungui - cati*	Occasional & Localised
European Olive *Olea europaea*	*Weed Alert* (likely to become a significant problem)
Glory Lilly *Gloriosa superba*	Occasional & Localised
Japanese Honeysuckle *Lonicera japonica*	Common & Widespread
Madeira Vine *Anredera cordifolia*	Occasional & Widespread
Mickey Mouse Plant *Ochna serrulata*	Occasional & Localised
Morning Glory *Ipomoea indica, Ipomea cairica*	Common & Widespread
Myrtle Leaf Milkwort *Polygala myrtifolia*	Occasional & Localised
Parrots Feather *Myriophyllum aquaticum*	Common & Localised
Privet *Ligustrum sinense Ligustrum lucidum*	Common & Widespread
Wild Tobacco *Solanum mauritianum*	Common & Widespread
Yellow Bells *Tecoma stans*	Occasional & Widespread
Yellow Waterlily *Nymphaea Mexicana*	Occasional & Localised

Source: Great Lakes Council

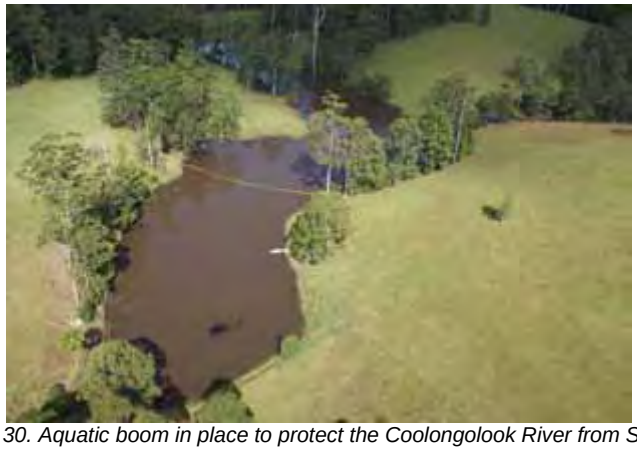


Figure 30. Aquatic boom in place to protect the Coolongolook River from Salvina.

Figure 31. Aquatic weed Parrots Feather on a tributary of the Myall River.

Figure 32. Portion of Karuah River flood plain infested with Water Hyacinth Eichhornia crassipes.

Response and Future Directions

The ongoing control and monitoring of noxious aquatic weeds such as Salvinia, Cabomba, Water Hyacinth but especially Alligator weed have taken priority due to their aggressive nature, and threat to severely degrade our waterways. Infestations of these weeds are on the increase.

A number of weed management projects have been undertaken during the 2008 – 2009 financial year. Some of the higher profile projects include:-

- A regional project in conjunction with the Mid North Coast Weeds Advisory Committee funded by HCR CMA (Hunter Central Rivers Catchment Management Authority). Great Lakes Councils portion of this funding was $20,000 targeting emerging thorny plants such as Black locust (*Robinia psuedoacacia*) and Mysore thorn (*Caesalpinia decapetala*) at Stroud and Tahlee.

- A regional project in conjunction with the Mid North Coast Weeds Advisory Committee funded by HCR CMA (Hunter Central Rivers Catchment Management Authority). Great Lakes Councils portion of this funding was $35,000 targeting the emerging vine weed Madeira vine (*Anredera cordifolia*) at Forster, Tuncurry, Smiths Lake, Coolongolook, Minimbah and Bungwahl.

- A Bitou threat abatement project funded through HCR CMA totalling $95,000 targeting Bitou bush at several high priority sites from Forster to Yacabba headland as identified in the Bitou threat abatement plan.

- A $50,000 Aquatic weeds project funded by HCR CMA focusing on water quality in the Crawford River Catchment but also incorporating other areas of the Great Lakes area. This project identified infestations of high priority aquatic weeds, treating them over a 2 year period starting 2007.

- A $30,000 project funded by HCR CMA focusing on obtaining an off label permit for the treatment of Parrots Feather within the Myall River Catchment. Field and tub Chemical trials have been conducted by NSW Department of Primary Industries in conjunction with Great Lakes Council and National Parks and Wildlife Service. A permit from APVMA is pending

- A camphor Laurel project commenced at Nabiac. Stage 1 of the project saw the removal of large Camphor Laurel and Privet in a high profile reserve in the village precinct. Some revegetation and mulching took place to help minimise weed seedling recruitment.

- Great Lakes Council has assisted NSW Department of Primary Industries with chemical trials on the submerged aquatic weed Cabomba *Cabomba caroliniana*. Several ponds in the Great Lakes local government area (LGA) have been treated and monitored for its success. It is hoped to find one or a number of chemicals suitable for use on this hard to manage aggressive weed.

- Great Lakes Council assisted NSW Department of Primary Industries with the application for a minor use permit of a chemical not yet registered in this Country. The chemical is hoped to be used for better control of Alligator weed in non core infestation areas.

During the reporting period 18 local agricultural shows, community events, farmers meetings and field days have been held by the noxious weeds inspector. Information sheets have been made readily available to the public on request and on Council's website. Regular media releases have also been conducted including a monthly article in the North Coast Town and Country.

There has been the continuation of planned control strategies for Bitou Bush and other terrestrial weeds, with works undertaken by local community groups at various locations assisted by Council. Council supports a network of over 700 volunteers being part of 55 working groups.

Several biological controls have been released and monitored across the Great Lakes LGA. The most recent being the a leaf sucking tingid fly *Carvalhotingis visenda* being released in a small infestation of Cats Claw Creeper at Upper Monkerai. Lantana rust *Prospodium tuberculatum* although now being established in a widespread area of the Mid North Coast it is not yet having a major impact on infestations. Great Lakes Council, as part of the Lantana Biological Control Taskforce will now be focusing on the release of new bio-agents when available. Salvinia weevil *Cyrtobagous savliniae* are continually being released and monitored across the Great Lakes LGA. In one particular release site, 7 hectares of tertiary growth Salvia at North Arm Cove has seen a 95% reduction in biomass over a 4 year period proving to be an increasingly important part of a successful integrated pest management program.

Figure 33. Photos depicting a 95% reduction in plant biomass from January 2005 to April 2009

A joint program with Council's Roads Coordinator is continuing, combining general roadside chemical vegetation control with the Giant Parramatta Grass and Rats Tail Grass (GPG/GRT) program and targeting approximately 944km of rural roads.

Great Lakes Council has developed and produced an informative, regionally based booklet entitled Garden Escapees & Other Weeds of Bushland Reserves. This is the second edition of the booklet now released under the banner and auspices of the Mid North Coast Weeds Advisory Committee. This clear and concise booklet provides residents with reference material that is easily read and understood. The booklet typifies weeds and general garden plants growth habit for residents / general community to easily identify plants that threaten the integrity of the remnant bushland and foreshore reserves. Approximately 65% of noxious and environmental weeds have escaped from parks and home gardens. Ten thousand (10,000) copies have been produced for release through Great Lakes, Greater Taree City, Port Macquarie - Hastings, Gloucester and Kempsey Shire Councils.

As a part of the Mid North Coast Regional Weeds Committee, Council has developed the mandatory Class 4 weed management plans. These plans have been incorporated into a two sided plant profile and control functions sheet that doubles as an education extension tool (available on website). Council has commenced producing similar plans for Class 2 and 3 weeds and will, over time develop plans for all Classes of Noxious weeds, plus Weeds of National Significance and Environmental Weeds in the local area.

Council has contributed to and adopted the Mid North Coast Regional Weeds Strategy 2008 - 2012 and regional weed control management plans for Alligator weed, Bitou bush, Bird Lolly weeds, Noxious floating aquatic weeds, Giant Parramatta Grass, Crofton weed, Groundsel bush, Cabomba Asparagus weeds and Vine weeds.

Private property inspections are carried out with an aim to compliment regional control plans, the enforcement of regulations and to aid residents with information to assist their weed management programs. The main inspection program was focused in localised catchments adjacent to high value wetlands and waterways complimenting Councils previous and continuing investment in the protection and rehabilitation of these significant environmental assets. Council will continue to enforce the Noxious Weed Act where deemed necessary. In the first instance Council will seek to educate and encourage landowners to control weeds. Emphasis will always be on a personal approach with an accompanying letter. Notices will be issued where landowners fail to co operate fully in the control of noxious weeds on their property or are conducting activities that serve to facilitate the spread of noxious weeds.
This action is usually successful and Council has rarely needed to resort to Court Action, despite the legal ability to do so.

Great Lakes Council has one full time weed officer, who is responsible for all control, administration and mapping duties. Council has recently employed a temporary part time officer to assist with weed management duties. Due to the extensive and continuing nature of weed infestations and current resource limitations Council will be focusing on the management of new incursions and weeds of limited distribution, the issue of wide spread weeds in the LGA is likely to worsen over time, rather than remain static or improve.

Figure 34. Cover and example pages from the new Weeds Booklet

Table 4.4.3 Identified Needs for Action Regarding Weeds

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Continue weed mapping, volunteer support and educational/promotional duties	• Continue and improve weed management activities	Recreational Services	Y	Ongoing
Develop weed management plans for all noxious weeds found in shire	• Continue and improve weed management activities	Recreational Services	Partial	Within 2yrs
Implement on-ground control works for all Class 2, and 3 Noxious weeds, selected Class 4 weeds and Environmental Weeds	• Continue and improve weed management activities	Recreational Services	N	Ongoing
Continue to enforce National Weeds Act	• Continue and improve weed management activities	Recreational Services	Partial	Ongoing
Consider the need to expand the Noxious and Environmental Weed activities of Council by increasing staff in this area	• Continue and improve weed management activities	Recreational Services	No	Within 2yrs

4.5 Seagrass

Introduction

Seagrass beds are a fragile and intricate component of our estuaries and play an important role in the healthy functioning of our waterways. Seagrass provides essential habitat for a variety of aquatic species and protects our shoreline by stabilising sediments such as sand and clay. Although important, the extent of seagrass beds throughout NSW are in decline with more than two thirds of seagrass beds destroyed over the past 30 years. This decline has been attributed to human impacts including pollution, development, dredging, recreational activities and poor land management. Since these impacts lead to measurable dieback and decreased density in seagrass beds, they are an ideal indicator for monitoring the health of our waterways.

Seagrass beds are sensitive to many factors including turbidity, pH, nutrient levels, temperature and physical disturbance. Resilience of seagrass differs for individual species, as some are more sensitive to disturbance and stress than others.

The local lake systems comprising Wallis, Smiths and Myall Lakes support some of the most extensive seagrass communities within NSW. Wallis Lake alone is well known for the most northern population of Strapweed (*Posidonia australis*) within Australia. Three additional native species of seagrass including Eelgrass (*Zostera capricorni*), Paddleweed (*Halophila ovalis*) and Sea Tassel (*Ruppia megacarpa*) are also found within Wallis Lake.

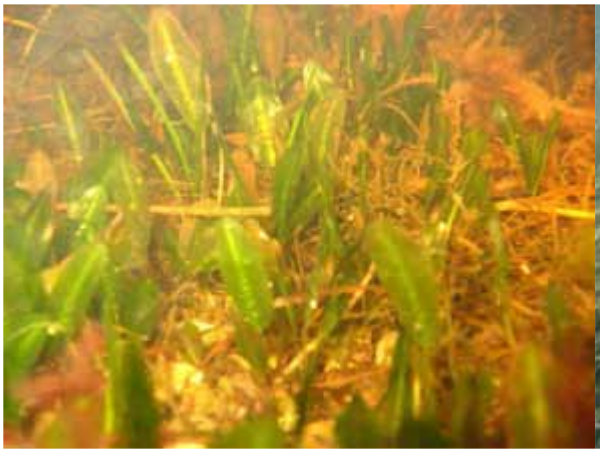


Figure 35. Paddleweed - Halophila ovalis

Figure 36. Eelgrass - Zostera capricorni

Monitoring

In 2002, Council developed a community seagrass-monitoring program to assess small-scale seasonal variability in seagrass beds within Wallis Lake. This program aimed to involve community volunteers in determining the health of Wallis Lake and its catchment and to monitor the effectiveness of environmental management within the region. Previously to this reporting period monitoring occurred at

11 sites within Wallis Lake. Volunteers measured the presence and density of seagrass, macroalgae and epiphytes species as well as the turbidity, depth and general observations.

However, data that was collected during previous years was not able to be analysed in a meaningful way and, therefore is not continuing as an indicator for this report.

Trend Analysis

As there is no quantifiable data available for this indicator, no trend analysis will be performed.

Figure 37. Community seagrass monitoring training

Summary and Future Directions

Unfortunately, data collected through Council's Community Seagrass Monitoring Program in previous years has been rendered unusable for this report due to its vastness and subjective nature. The possible future use of satellite imagery (which would indicate areas and extent of sea grass beds), in conjunction with ground truthing by volunteers, could result in the revisiting of the use of seagrass monitoring as a SoE indicator. A limitation of satellite imagery is its expense; however, Council is currently investigating the acquisition of satellite imagery for the purpose of seagrass monitoring.

Table 4.5.1 Identified Needs for Action Regarding Seagrass

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Obtain satellite imagery to enable redevelopment of community sea-grass monitoring program	• Acquire Satellite Imagery	Natural Systems	Partial	Within 2yrs
Provide general education and awareness on the value of Seagrass through the Healthy Lakes Program	• Healthy Lakes Program (continue and expand initiatives)	Natural Systems	Y	Within 2yrs

4.6 Recovery Plans and Threat Abatement Plans

Introduction

In New South Wales, threatened native plants and animals, populations and communities are listed on the *Threatened Species Conservation Act 1995* (with the exception of fish and marine plants which are listed on the *Fisheries Management Act*). These Acts provide for the identification, conservation and recovery of threatened species, populations and communities and also aim to reduce the threats faced by those species.

Since its amendment in 2003, the preparation and implementation of recovery plans for each species, population or ecological community listed as threatened is no longer mandatory, although the recovery planning mechanism does remain for relevant threatened biodiversity. Instead, there is a requirement for the preparation and implementation of priority action statements for threatened entities. Where recovery plans are prepared and implemented, they are typically designed to return the species, population or ecological community to a point where it is viable in nature and is no longer at risk of extinction. Among other things, recovery plans outline the actions that government and other organisations are bound to undertake to achieve that recovery.

It is a legislative requirement of the SoE process that actions within approved recovery plans are reported on annually.

An analysis of recorded sightings of threatened biodiversity indicates that the Great Lakes LGA contains **115** threatened entities as shown in Table 4.6.1.

Table 4.6.1: Number of threatened entities known to occur within the Great Lakes LGA.

Number of known threatened and endangered groups within the Great Lakes LGA.	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Group	No. known in Great Lakes LGA	No. known in Great Lakes LGA	No. known in Great Lakes LGA	No. known in Great Lakes LGA	No. known in Great Lakes LGA
Endangered populations	2	2	3	3	3
Endangered ecological communities	9	9	10	11	11
Threatened flora	21	24	24	26	27
Threatened mammals	25	26	26	26	26
Threatened frogs	6	6	6	6	6
Threatened reptiles	1	1	1	1	1
Threatened birds	36	39	39	39	40
Threatened aquatic fauna (estuarine)	No data	No data	No data	1	1
Total	**100**	**107**	**109**	**113**	**115**

Source: Great Lakes Council

To date, within the Great Lakes LGA, the following Approved Recovery Plans are currently operational:

- State Recovery Plan for the Endangered Koala Population of Hawks Nest/ Tea Gardens
- State Recovery Plan for the Yellow-bellied Glider
- State Recovery Plan for the Red Goshawk
- State Recovery Plan for the Little Tern
- State Recovery Plan for the Bush Stone-curlew
- National Recovery Plan for the Swift Parrot

Figure 38. The Red Goshawk

Monitoring

For each SoE report, an annual summary will be presented on Council's progress towards relevant recovery actions for each of the State Recovery Plans mentioned above. Only recovery actions that Council has a lead or supporting role in implementing will be reported against.

Results

Table 4.6.2: Hawks Nest and Tea Gardens Endangered Koala Population Recovery Plan Implementation outcomes achieved to date.

Hawks Nest and Tea Gardens Endangered Koala Population Recovery Plan Actions	Council Action	
Action	**Commenced**	**Completed**
1.1 Plan coordination	Yes	In progress
1.2 Develop working group	Yes	Yes
1.3 Monitoring program	No	No
2.1 Mapping and reporting	Yes	No
3.1 Prioritise management areas	No	No
3.2 Survey habitat links	Yes	No
3.3 Survey/ assessment guidelines	Yes	No
3.4 Blackspot identification	Yes	No
3.5 Strategic streetscaping	No	No
3.6 Companion animal policy	No	No
3.7 Coordination of dog control	Yes	No
4.1 Habitat zoning	Yes	No
4.2 Awareness of protection measures	No	No
4.3 Support BFMC	No	No
4.4 GLC Plans of Management	Yes	No
5.1 Rehabilitation/ replanting advice	Yes	No
6.1 Establishment of database	Yes	No
6.2 Education and awareness	Yes	No
7.1 Information exchange	Yes	No
7.2 Identification of release sites	Yes	No

Table 4.6.3: Little Tern Recovery Plan Implementation outcomes achieved to date.

Little Tern Recovery Plan Actions (where Council is an implementation partner)	Council Action	
Action	**Commenced**	**Completed**
1.1 Inform and consult with land managers	No	No
2.1 Intensive management of nesting, resting and fledgling feeding sites	No	No
3.1 Investigate the potential for the incidental creation of island nesting sites using dredge spoil	No	No
8.2 Targeting community groups	No	No
8.4 Liaison with interest groups	No	No

Table 4.6.4: Red Goshawk Recovery Plan Implementation outcomes achieved to date.

Red Goshawk Recovery Plan Actions (where Council is an implementation partner)	Council Action	
Action	**Commenced**	**Completed**
3.1 Formulate standardised survey methods	No	No
4.1 Communicate environmental impact assessment and survey guidelines	No	No
4.2 Education package on identification, distribution, habitat, status and threats	No	No
5.4Management of populations on public land	No	No
5.5 Awareness of long-term protection measures	No	No
5.6 Maintain strict security around nest sites	No	No

Table 4.6.5: Yellow-bellied Glider Recovery Plan Implementation outcomes achieved to date.

Yellow-bellied Glider Recovery Plan Actions (where Council is an implementation partner)	Council Action	
Action	**Commenced**	**Completed**
2.1 Formulate standardised survey methods	No	No
2.3 Inclusion of regional based habitat types, sap trees and sap tree species in EPI	No	No
2.6 Consideration of impacts of fragmentation by road, easement and linear clearing design	No	No
3.1 Identification of significant populations and their associated specific management issues	No	No
4.1 Strategic research	No	No
4.2 Information package for community awareness of habitat sap trees and protection and enhancement	No	No

Table 4.6.6: Bush Stone-curlew Recovery Plan Implementation outcomes achieved to date.

Bush Stone-curlew Recovery Plan Actions (where Council is an implementation partner	Council Action	
Action	**Commenced**	**Completed**
1.1 Support existing projects	No	No
2.1 Publicity activities to raise awareness	No	No
2.2 Maintain and distribute information materials	No	No
2.4 Bush Stone Curlew summit	No	No
3.1 Identify and map habitat	No	No
3.2 Field and community surveys	No	No
3.3 Predator and pest control programs	No	No
3.4 Annual monitoring of populations	No	No
3.5 Manage habitat (non-public land)	No	No
3.6 Apply for off-label permits for 1080 baiting programs	No	No
3.7 Protect and manage habitat on public land	No	No
3.8 Encourage habitat protection on private land	No	No
3.9 Establish and support community groups	No	No
3.10 Prepare and implement management plans	No	No
4.2 Identify sites for translocations	No	No
4.4 Secure funding for post-release monitoring	No	No
6.1 EIA and survey guidelines	No	No
6.2 Consideration during EPI biodiversity certification	No	No
6.5 Enter records into Atlas of NSW Wildlife	No	No

7.1 Ecological research	No	No
8.3 Research into habitat degradation	No	No
11.1 Source funding for implementation	No	No

Table 4.6.7: Swift Parrot Recovery Plan Implementation outcomes achieved to date.

National Swift Parrot Recovery Plan Actions (where Council may be an implementation partner)	Council Action	
Action	**Commenced**	**Completed**
1a. Identify the extent and quality of foraging habitat within the over-wintering range (especially Coastal Spotted Gum, Swamp Mahogany and northern Forest Red Gum/ Ironbark Forests)	No	No
2a. Mapping of foraging and breeding habitat	No	No
2b. Management and protection of habitat	No	No
5a. Community and volunteer network	No	No

Trend Analysis

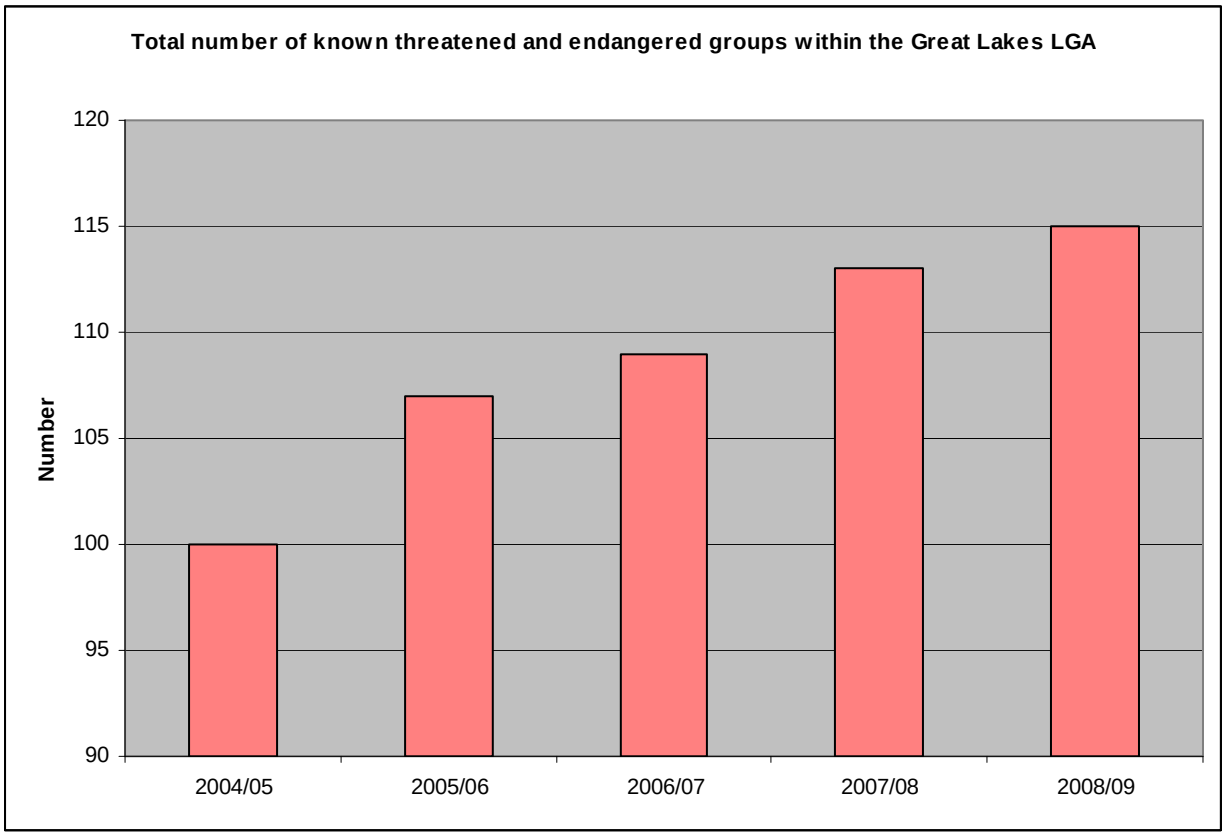


Figure 39. Number of known threatened and endangered groups in the Great Lakes

Figure 39 shows that there has been a gradual increase in the number of threatened and endangered groups. The increase in numbers is primarily seen in threatened flora; threatened aquatic fauna (estuarine); endangered ecological communities and endangered populations.

Response and Future Directions

Council has been a key and active player in the assistance of recovery efforts for the endangered Hawks Nest/ Tea Gardens Koala population and significant momentum and partnerships has been achieved to date. However, recovery actions pertaining to other threatened species have been largely neglected due to resource limitations. Continued refinement of Council's involvement in the recovery planning processes for threatened species is beneficial and should be reflected in work programming and resourcing.

Council need also be mindful of the adopted Priority Action Statements for threatened species, ecological communities and populations and not undertake actions in contravention of these actions and to support such actions wherever possible.

Table 4.6.8 Identified Needs for Action Regarding Threatened Species

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Work with DECC to implement actions in Recovery Plans for the following species: Little Tern, Red Goshawk, Yellow-bellied Glider, Bush Stone-curlew	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements	Natural Systems	N	Within 2yrs
Continue to be a lead agency in the implementation of the Hawks Nest Tea Gardens Koala Recovery Plan	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements	Natural Systems	Y	Ongoing
Develop and implement a shire-wide (comprehensive) Koala Plan of Management to support Recovery Planning for this species	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements	Natural Systems	Partial	Within 2yrs
Develop and implement education on threatened species, populations and communities	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements • Biodiversity education (develop and expand initiatives)	Natural Systems	Partial	Within 2yrs
Develop and implement a program to support ecological research into key threatened species and ecologically endangered communities in the LGA	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements	Natural Systems	N	Within 2yrs
Map and conserve the extent of Endangered Ecological Communities in the LGA	• Assist in implementation of Threatened Species Recovery Plans and Priority Action Statements	Natural Systems	N	Within 2yrs

5 Waste & Toxic Hazards

If not disposed of thoughtfully, many of the substances we use can have a devastating effect if released into the environment. Water, air and land pollution results from the release of waste and toxic hazards into our environment and can lead to significant site contamination issues. Legislation relating to a number of dangerous chemicals and waste products has been gazetted to reduce the impact of these substances on human health and the environment. However we still have some way to go in reducing the potential of waste and toxic hazards seriously affecting our natural environment.

Figure 40. Recycled material ready for market at the Tuncurry Waste Management Centre

5.1 Waste

Introduction

Waste management is an issue for Local Government in relation to both human and environmental health. Waste disposal methods have been based on engineered landfill methods, which are the accepted standard for waste disposal. However, there has been a shift towards providing a more sustainable waste management system that provides incentives to reduce waste, opportunities to reuse, recover or recycle materials and ways to efficiently dispose of the residual waste in a satisfactory manner. As such a move from landfill to integrated waste management centres has been adopted. This move has occurred in line with waste management reforms with the introduction of the *Waste Avoidance and Resource Recovery Act 2000*. Reducing waste through the methods mentioned above not only conserves raw materials (thus reducing the environmental impacts of extractive activities throughout the world), but it also reduces the need to convert more areas into landfill sites.

Councils Waste Management Services section is responsible for managing four (4) waste management centres in the LGA at Tuncurry, Tea Gardens, Bulahdelah and Stroud. Licensing under the *POEO Act* (1997) has been issued for the Tuncurry operation, due to its size, and as such Council has a legal responsibility to fulfil monitoring obligations, and ensure environmental protection.

Monitoring

At each centre the quantity of total waste is monitored as well as the breakdown of each waste component including total waste to landfill, recycling, green waste, kerb-side recycling and chemical/ hazardous waste. However, as different units of measure have been used, there are issues with the compatibility of such data. Subsequently, for the purpose of this report, data measured by volume is converted into weight as per acceptable methods of calculation (EPA land filling guidelines).

Furthermore the total weight of waste per capita is based on the predicted population as derived by the 2006 census.

Results

Figure 41. Concrete crushing (recycling into roadbase) – Tuncurry waste management centre

Through the process of routine garbage collection, recycling initiatives and public use of Councils Waste Management Centres **56 310 tonnes** of waste was collected during the 2008/09 reporting period which is an increase of 18 653 tonnes since the last reporting period, whilst the population has increased to approx 34 853 people. This is the equivalent of 1.61 tonnes for each person living within the Great Lakes LGA. The amount of waste going to landfill is up by 1031 tonnes, and general recycling has decreased by 3747 tonnes. A proportion, approximately 44%, goes to landfill with the remaining waste distributed among Councils recycling initiatives. This includes green waste, scrap metal, general recycling material including plastic, paper, glass, metal and materials collected through the kerb-side recycling program.

Table 5.1.1. The total amount of waste collected including a break down of components for recycling.

Year		**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Total Waste (Tonnes)		51,275	37,232	42,458	37,657	56,310
Total Waste Per Capita (Tonnes)		1.55	1.07	1.25	1.14	1.61
Total Waste Landfilled (Tonnes)		37,244	25,359	29,682	23,743	24,774
Green Waste (Tonnes)		1,255	2066	3511	2601	7402
Scrap Metal Recycling (Tonnes)		1,423	887	464	344	199
General Recycling (Tonnes)		4,595	2654	1738	5764	2017
Kerb Side Recycling (Tonnes)		1,602	2450	3255	3484	3347
Clean Fill (Landfilled) (Estimate in Tonnes)		5,000	3766	3675	1263	15102
Reuse Items (estimate only in Tonnes)		115	0.36	102	416	3446
Chemical / Hazardous Waste (Tonnes)	Oil	7.8	9.86	15.49	8.76	1.634
	Batteries	32.24	38.67	25.95	21.268	21.66
	Chemicals	0.521	0.36	.220	0.660	.171

Source: Great Lakes Council

Trend Analysis

This trend analysis has separated the data into two types of waste. The first division of data represents the total amount of waste; total waste landfilled; and clean fill (landfilled). The second division represents recycled or reusable material.

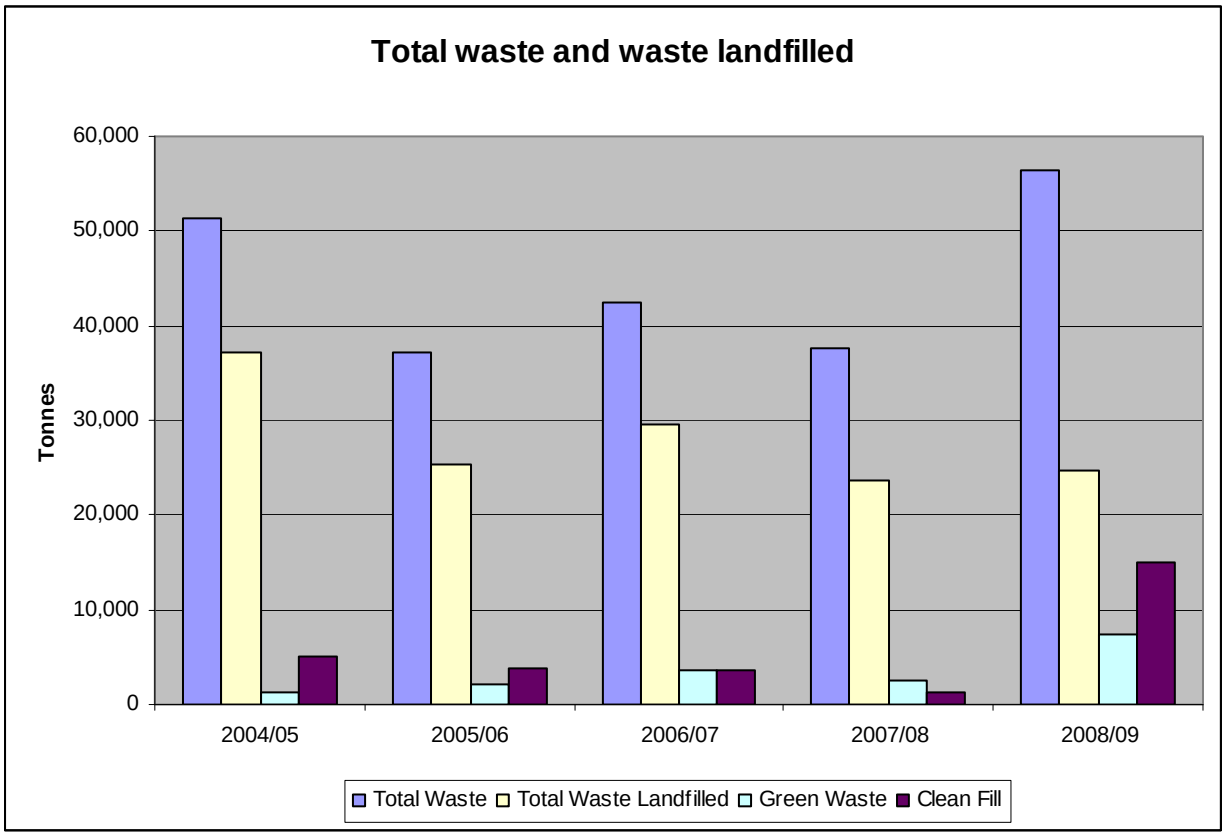


Figure 42. The amount of waste landfilled, including a breakdown of waste streams

The amount of waste collected for the 2008/09 reporting period is the highest recorded over all 5 reporting periods, as is clean fill and green waste. The amount of waste landfilled has also increased only slightly from last year.

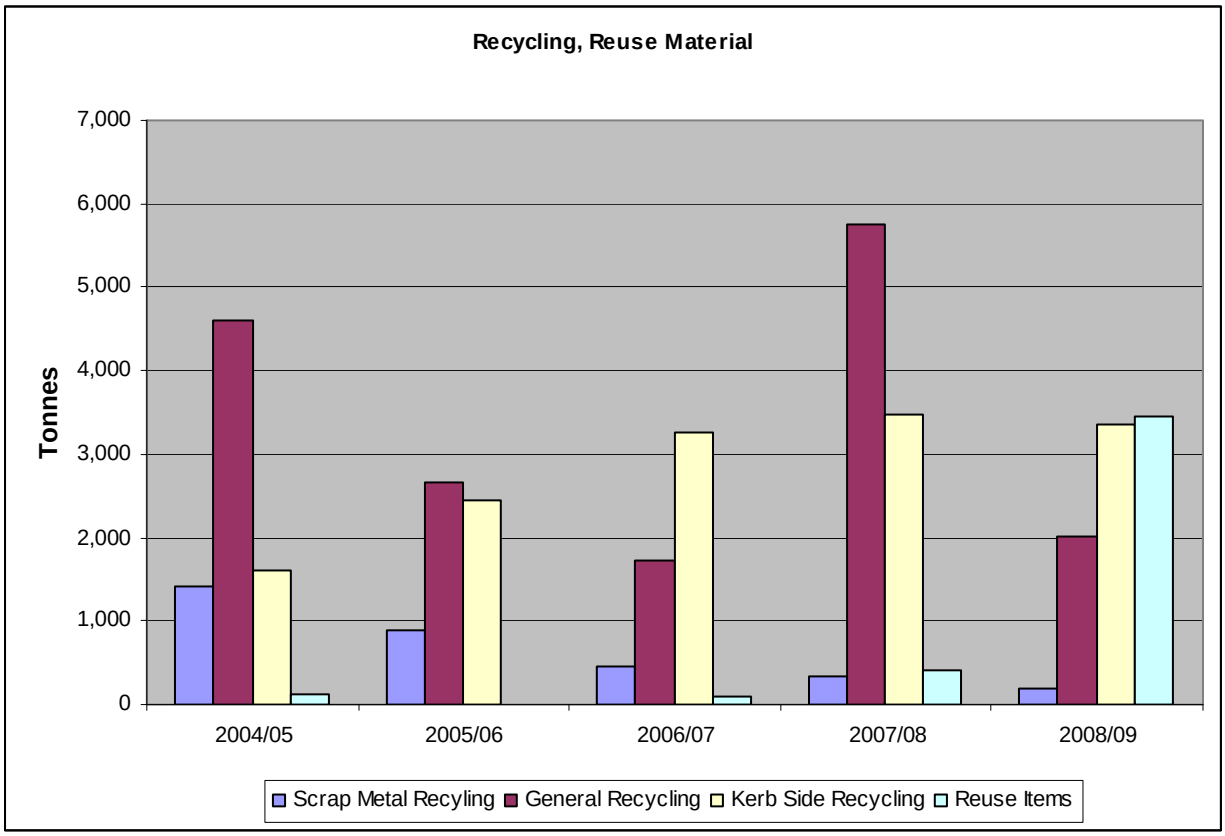


Figure 43. The amount of recyclable or reusable material

The amount of general recycling that has occurred over the last 5 reporting periods has varied considerably between the years. The figure above (Figure 43) shows a steady decline in the amount of scrap metal recycling occurring at the landfill. This could possibly be reflecting the increased value of scrap metal which has created a market diverting scrap metal to private companies.

There is also a significant increase in the amount of reuse items that are taken to the waste management centre by over 800%.

It is likely that the increased total for waste collection is a direct result of the increased amount of reuse items, clean fill and green waste received at the waste management centres, rather than an increase in the production of waste across the LGA.

Response

The Waste Services section of Council has introduced a number of programs in order to help reduce waste production in the LGA, including:

- Introducing recycling to flats and units
- The Waste Watchers education program to local schools
- Promotion and coordination of Keep Australia Beautiful Day/Clean up Australia Day/Recycling Week
- Regular bulky waste cleanups
- Development of Reuse, Recycling and Waste Transfer Stations
- Formulating a Policy and Procedures Statement on Hazardous Waste receiving and handling
- Development of shared waste infrastructures and services with Taree and Gloucester Councils (Minimbah Landfill)
- Trialling of resource recovery options for materials such as mattresses, building materials, rechargeable batteries, smoke detectors, gas bottles and computer towers
- Reprocessing of construction and demolition waste - concrete, bricks and tiles
- Active member of MidWaste, a partnership between councils in the Mid North Coast region, resulting in a number of cost sharing and improved efficiency outcomes such as the securing of regional scrap metal and greenwaste contractors and the Primary Schools recycling program.

Future Directions

The disposal of waste is an ongoing issue that has long term implications for the health of our natural environment. With continuing development and increasing affluence, there will be greater pressure on our landfills and the natural environment. The implications of this has long been recognised with a move to developing more sustainable waste management practices to minimise the quantity of rubbish and hazardous materials entering landfills and, in turn, reducing the impact on the local environment.

The State Government's Waste Avoidance and Resource Recovery Strategy focuses on turning unavoidable waste into a valuable resource. This strategy guides the efforts of State and Local government agencies, industry and the broader community in waste prevention and avoidance, reuse and recycling.

Great Lakes Council is committed to reducing the quantity of waste that enters our landfill. Subsequently alternate waste management methods including recycling and reuse of many materials is encouraged. Council has also put in place a pricing policy to encourage the separation and recycling of material that is received at the waste management centre. However this is a community wide issue, which requires the commitment and cooperation of all residents to ensure the impact we have on the local environment is minimised when it comes to the management of our waste.

It is therefore hoped that this indicator will show a decrease in the quantity of waste that is disposed of in landfill and a corresponding increase in the amount or proportion of material that is recycled and reused.

Table 5.1.2 Identified Needs for Action Regarding Waste

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Continue to implement promotional and educational activities that aim to reduce waste to landfill.	• Continue and improve waste education initiatives	Waste Services	Y	Ongoing
Continue to expand and improve waste recovery options	• Implement Waste Strategy actions into new contracts	Waste Services	Y	Ongoing
Work with Environmental Health and Natural Systems sections to target reduction of urban litter, particularly cigarette butts, plastic bags and fishing line.	• Continue and improve waste education initiatives	Waste Services	Partial	Within 2yrs
Work with Purchasing Officer to buy recycled content products	• Implement Sustainable Purchasing Policy	Council wide	Y	Ongoing

5.2 Sewage Treatment & Disposal

Introduction

Inadequate sewage treatment and disposal can pose a significant threat to public and environmental health. As such, stringent regulations in the form of licensing have been imposed for all effluent management authorities. Within the Great Lakes, MidCoast Water manages the reticulated sewer system in line with licensing conditions issued by the Department of Environment, Climate Change and Water. In the Great Lakes LGA those living in most towns and villages (comprising 92% of population) have access to the centralised sewerage network with rural and some small village areas generally relying on individual/ on-site sewage management methods (e.g. septic systems).

Effluent discharged into the sewer system is managed at one of five (5) sewage treatment plants located at Forster, Hallidays Point, Stroud, Hawks Nest or Bulahdelah. The Tuncurry plant has been decommissioned with waste transferred to Hallidays Point. Construction has also begun to upgrade the Stroud sewage treatment plant. Wastewater at each treatment plant is processed to a secondary or tertiary level through a range of methods. Following this process, treated water is discharged into the ocean, nearby waterways or filtered through sand dunes (groundwater disposal).

Dwellings outside the reticulated sewer network rely on on-site sewage management systems (OSMS) as a means of wastewater treatment and disposal. Various appropriate on-site systems (OSMS) are available. Great Lakes Council is responsible for managing OSMS, all of which are required by legislation to be registered with the Council. The registration process assists Council to assess and manage the impact of OSMS with regard to public and environmental health.

Figure 44. Sewage treatment at MidCoast Water's Hallidays Point sewage treatment plant.

Environmentally, both OSMS and sewage systems work effectively if maintained and managed appropriately. As the reticulated sewer system is heavily regulated and bound by licensing agreements, management is relatively effective. Nevertheless, there are serious risks associated with spills of untreated effluent or overflows of sewage from the sewer system. On-site Sewage Management Systems (OSMS) on the other hand are privately managed and their regulation and management is difficult. Neglected OSMS may pose a threat to the local environment if effluent enters nearby waterways or seeps into the ground water.

As an indicator of environmental health, the monitoring of the number of dwellings connected to reticulated sewer and the number of on-site systems provides an indication of pressure placed on the local environment.

Monitoring

Council's Environmental Health section is able to provide information in relation to the number of properties serviced by OSMSs, the type installed and the number of new on-site systems registered.

MidCoast Water is the region's sewage service provider and as such information is sourced from this authority in regards to the number of properties serviced by the sewage system, the type of connection and the number of new connections approved in the reporting year.

MidCoast Water carries out a number of environmental testing programs to monitor the impact of treated effluent release on the receiving water environment. This includes the monitoring of Frys Creek and the Myall River, at Bulahdelah. Groundwater around the dune disposal area at Hawks Nest is also monitored and MCW conducts ecological assessments through the Forster STP ocean release study every 5 years. The ocean study includes flora and fauna in different locations and bioaccumulation of potential contaminants of concern in fish and invertebrates.

Results

In total there are currently **4006** properties operating registered On-site Sewage Management Systems. A breakdown of these systems has been provided in the table below.

Table 5.2.1: Number of properties operating OSMS and the type of systems installed.

System	04/05	05/06	06/07	07/08	08/09
Aerated Wastewater Treatment Systems	820	887	910	929	936
On-site Disposal Systems	1831	1964	2030	2024	2037
Pump-out Systems	536	578	580	588	597
Composting Toilets	34	41	47	55	59
Chemical Toilets	37	43	47	41	40
Sanitary Pans	21	21	24	22	18
Pit Toilets	54	60	60	55	62
Mound	38	44	61	66	75
Sand Filter	54	59	67	69	68
Reed Bed	26	36	40	44	47
Biological Filter	No data	10	19	23	25
Pump to Sewer	No data	10	13	13	15
Commercial Treatment Plant	7	7	8	7	7
Other Systems	379	94	39	18	20
TOTAL	**3837**	**3854**	**3945**	**3954**	**4006**

Table 5.2.2: Number of new OSMSs installation approvals

	Number of new installation approvals:
2004/05	155
2005/06	81
2006/07	84
2007/08	102
2008/09	106

Source: Great Lakes Council

For the 2008/09 reporting period **106** new systems have been approved for installation. Please note, this number varies from the reported difference between the number of systems installed for each reporting period (Table 5.2.1). This difference is due to changing criteria for this indicator. i.e. the difference between reporting when a system is 'installed' versus when it is 'approved for installation'.

For the 2008/09 reporting period **16 341** properties were connected to the reticulated sewage system. Of these **82** were new connections, down from **103** new connections last reporting year. The total volume of wastewater collected in Great Lakes sewerage system during 2008/09 was **3650 million litres**, down from 4023 million litres in 2006/07 (see Table 5.2.3).

Table 5.2.3 Connections to reticulated sewer and waste water collected

Year	04/05	05/06	06/07	07/08	08/09
Number of properties connected to reticulated sewage system	15552	15870	16182	16259	16341
Number of new connections	270	294	312	103	82
Total volume of waste water collected (million litres)	4075	3556	3470	4023	3650

Source: MidCoast Water

Trend Analysis

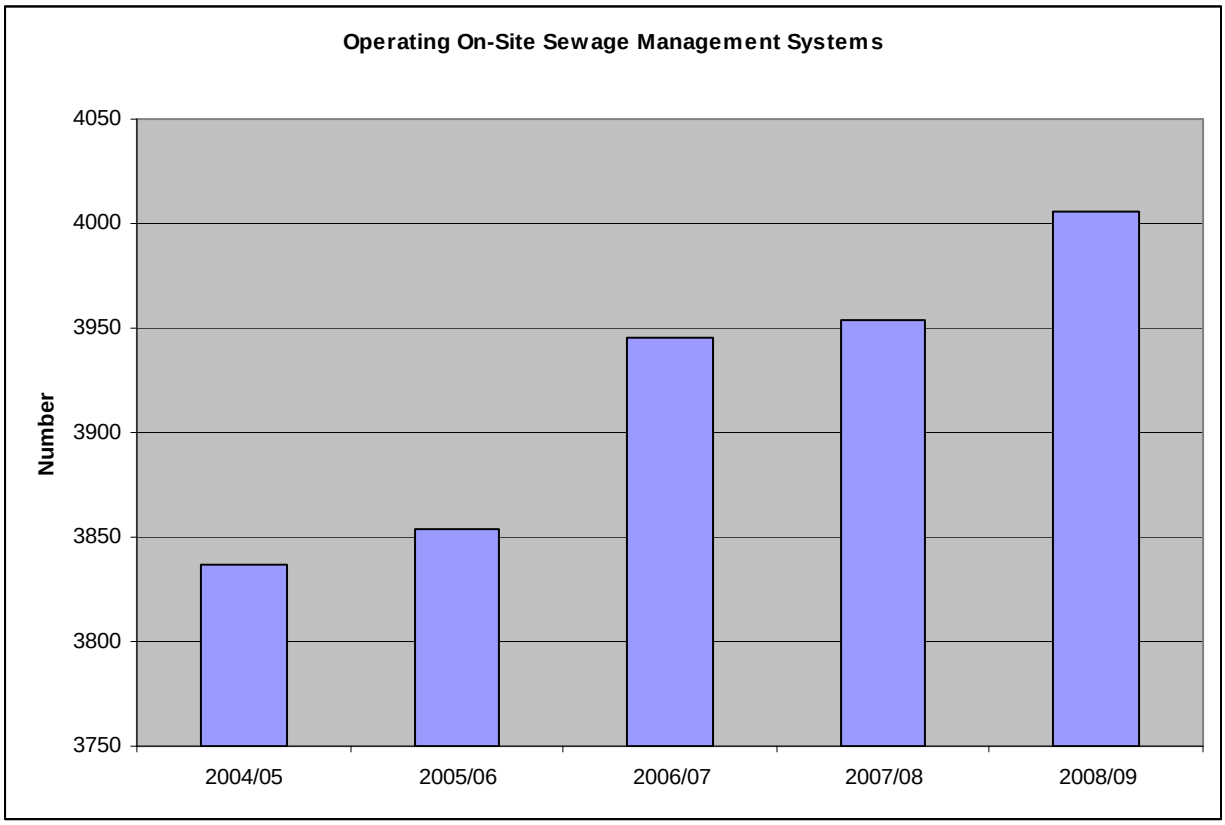


Figure 45. The number of operating On-Site sewage management systems

The number of OSMS systems that are operating in the Great Lakes LGA has been steadily increasing over the last 5 reporting periods. This is most likely attributed to the increase in population, particularly in the outlying unsewered villages and towns.

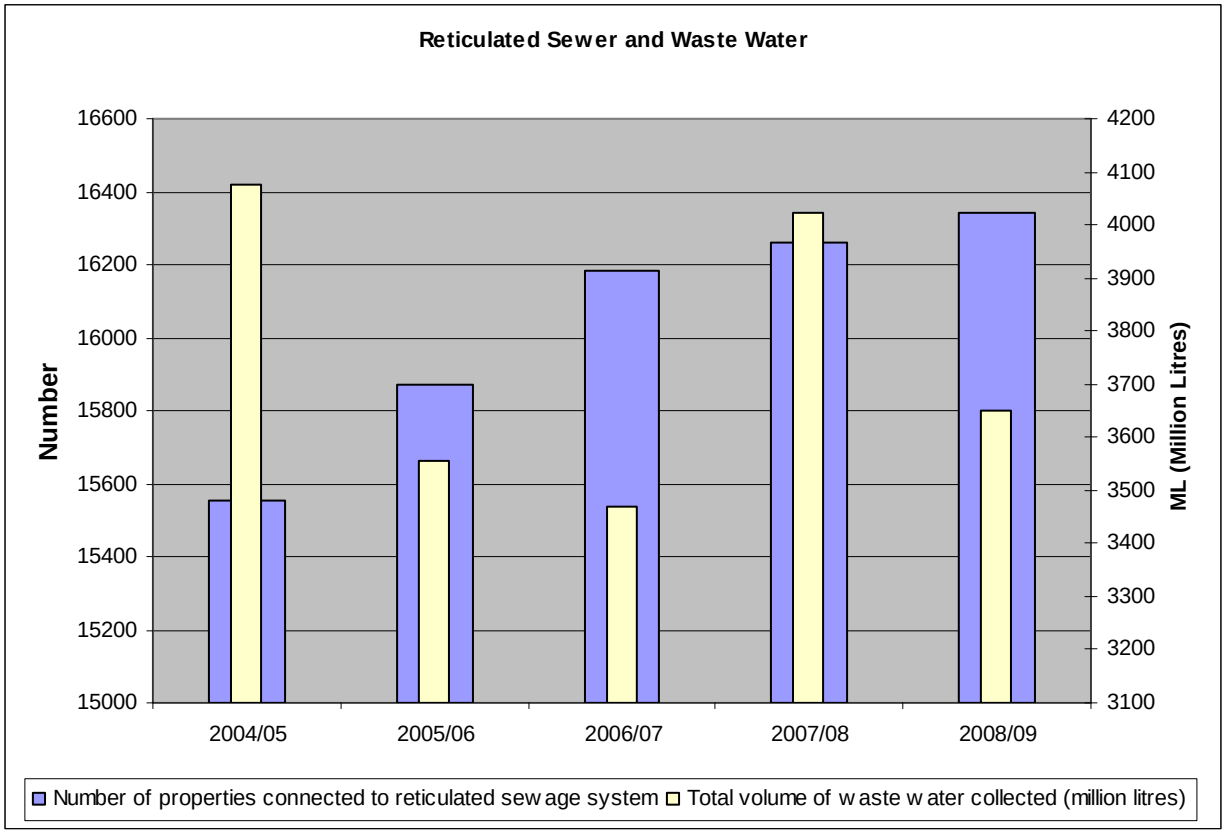


Figure 46. The number of properties connected to the reticulated sewage system, and the volume of waste water collected

Figure 46 shows that there has been a steady incline on the number of properties that are connected to the reticulated sewage system. However the volume of waste water collected does not also reflect this increase, showing variable figures over the 5 reporting periods. 2005/06, 2006/07 and 2008/09 experienced an increase in the number of properties connected, but saw dramatic decreases in the volume of waste water collected which is directly connected to the volume of water used.

Summary

Due to financial and environmental limitations it is not feasible to connect all properties within the Great Lakes LGA to the reticulated sewer system. Therefore a proportion of property owners have to utilise On-site Sewage Management Systems to treat their sewage.

However OSMS's are often difficult to regulate, so it is harder to ensure environmental safety from overflows and leaks. Hopefully over time, SoE reporting will indicate an increase in the number of properties connected to the sewage network and a reduction in the number of properties utilising OSMS's.

Current Response and Future Directions

Great Lakes Council inspects a minimum of 500 on-site systems per year to ensure they meet environmental and health requirements.

Midcoast water is undertaking a number of projects to improve sewage treatment in the LGA. Updates against these projects are provided below.

New Wastewater Treatment Plant at Stroud

Construction is underway on a new Stroud Sewage Treatment Plant, to be built on Simmsville Road, which will replace the 30 year old operation in Spencer Street.

The new plant will be built to cater for 1500 ep (equivalent persons), double that of the existing plant. Once commissioned, the plant will treat effluent to a level suitable for use on agricultural land - extending MidCoast Water's reuse program to see 95% of recycled water from the new Stroud plant beneficially reused, which will minimise the amount of treated water going into the sensitive Karuah River. To achieve this reuse target, the new plant will include the capacity to store up to 28 million litres of treated water.

Pacific Palms STP

A new treatment plant is being developed at Pacific Palms, to allow for the secondary treatment of sewage, prior to transfer to the Forster Plant for final treatment and release. Currently, raw sewage is transferred by pipeline for treatment at the Forster Plant. Once completed the Pacific palms Treatment Plant will reduce the environmental risk associated with transferring untreated wastewater over long distances.

Tea Gardens vacuum sewerage System

Upgrades are also nearly completed at Tea Gardens, which will see the development of a vacuum sewerage system to cater for growth in the area. Vacuum sewerage systems minimise wet weather infiltration, which leads to a reduction in the volume of sewage to be treated.

5.3 Toxic Spills

Introduction

Toxic spills are usually random, one-off incidents that have the potential to cause great pressure on the Great Lakes environment. For example, toxic spills could result from sewage overflows, serious truck crashes or other contamination events. All toxic spills have an impact on the natural environment. The extent of this damage is determined by the substance(s) released, their amount and the location/ extent of the spill, especially its proximity to sensitive environmental features.

Figure 47. Road spills can easily contaminate nearby waterways and environments

Monitoring

The NSW Fire Brigade and Rural Fire Service usually respond to incident-based toxic spill events and the NSW Fire Brigade maintains records on the incidents responded to. Further, the DECCW Environmental Protection Authority) and Council's Environmental Services section respond and manage toxic spill events in this LGA.

Results

The NSW Fire Brigade are responsible for maintaining records on toxic spills.

For the last four reporting periods their records are as follows:

Table 5.3.1: Number and Type of spills in LGA

Type and Number	2004/05	2005/06	2006/07	2007/08	2008/09
Combustible spills	26	16	3	17	-
Heat related	3	3	-	-	-
Other hazardous materials	2	2	1	1	-
Miscellaneous hazardous	-	-	-	-	-
Aircraft incidents	-	-	-	-	-
Other	-	1	-	-	1
Total	**31**	**22**	**4**	**18**	**1**

Source: NSW Fire Brigade

The above table shows the number of spills recorded in the Great Lakes LGA for four reporting periods. However, this data from the NSW Fire Brigade does not give an indication of the nature or seriousness of the substance(s) spilled. Information on toxic spills is also sourced from DECCW this is the agency responsible for managing more serious spill events. DECCW reported no toxic spills this year.

Trend Analysis

There has been a general reduction in the amount of spills occurring in the LGA which may be a reflection of increased preventative measures.

Summary

It is important that all toxic spills are recorded and that Council is satisfied that all responses to such incidents are appropriate and effective. It is particularly important that a means to identify if there is an area of high risk or recurrence of spills is implemented such that toxic spill blackspots can be identified and appropriately managed. No such blackspots have presently been identified for the Great Lakes LGA.

6 Land

The way we plan and construct our built landscape has a direct impact on the health and function of our natural environment. Development in response to the demands of the increasing population remains one of the largest impacts on the Great Lakes LGA. Unless this development is planned in a sustainable and environmentally appropriate manner and includes the provision for open space, nature reserves, biodiversity, etc the very aesthetics and charm of the Great Lakes will be irreversibly lost.

Figure 48. An example of development within the Great Lakes region.

6.1 Development Pressures

Introduction

Development provides for much needed growth in urban populations and employment and provides for increasing affluence and socio-economic growth over time. However, inappropriate development in environmentally sensitive areas can have detrimental and serious effects on the environment on which we all rely. Over-development can also have cumulative environmental impacts that may be less obvious but equally serious. There is a clear need for development to be sustainable and within the thresholds imposed by social, physical and environmental conditions. Consequently, Council has significant responsibilities to carefully manage and provide for growth and development in a sustainable and responsible manner.

This SoE recognises that development can impact on the environment negatively. While it is not a direct indication of specific and measurable environmental impact, the number of development applications approved within the LGA does provide a measure of the amount of development pressures with which the LGA is being subjected to. For example, heavy development pressures are associated with increased demand for urban land and subdivision, which may in turn increase clearing pressures and affects on waterways through increased pollution.

As well as describing the annual trends associated with the number of Development Approvals within the LGA, this indicator describes trends in relation to how many of these Development Applications involve the consideration of environmental factors, i.e. how many DAs have the potential to exert significant pressures on the environment.

Monitoring

Data pertaining to the number and type of activities consented to through development approvals is collected and maintained by Council's Planning and Environmental Services division. When development activities are likely to require consideration of environment factors they are referred to the Natural Systems section, where data on the nature and scope of environmental impacts is collected and is included in this SoE.

This indicator also considers the changes to planning zones made during the year in relation to area (ie. rural to environmental protection). This information is collected by the Strategic Planning section.

Results

For the 2008/09 reporting period Great Lakes Council received 585 development applications and processed 487 construction certificates.

Table 6.1.1 Number of Development Applications and Construction Certificates received.

Year	Number of Development Applications	Number of construction certificates
2004/05	No data	178
2005/06	857	738
2006/07	824	754
2007/08	767	615
2008/09	585	487

Source: Great Lakes Council

63 DA's were referred to Council's Natural Systems and Estuaries section pertaining to environmental matters. From these referrals, the following data has been collated:

Table 6.1.2 Number of DAs referred to Council's Natural Systems Section

No. of DA Referrals to Natural Systems					
Location	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
Boolambayte	2	0	2	0	0
Booral	4	3	0	1	1
Bulahdelah	3	0	5	4	3
Bundabah	3	2	0	8	1
Bungwahl	3	4	4	4	1
Bunyah	0	2	1	1	0
Carrington	0	1	0	0	0
Coolongolook	2	6	3	2	0
Coomba Park	0	4	2	3	2
Darawank	0	0	2	0	0
Duralie	0	1	0	0	0
Failford	3	2	1	3	4
Forster	7	6	9	4	1
Girvan	0	2	0	0	1
Green Point	4	0	3	0	0
Hawks Nest	18	6	9	5	5
Karuah	1	0	0	1	0
Limeburners	1	1	0	2	1
Markwell	1	1	0	0	1
Mayers Flat	1	0	0	0	0
Minimbah	2	5	2	2	4

Nabiac	8	5	3	0	1
Nerong	1	2	0	3	1
North Arm	7	9	8	2	2
Pacific Palms	7	16	16	6	6
Pindimar	9	6	1	3	5
Seal Rocks	5	2	2	1	2
Smiths Lake	12	4	5	6	9
Stroud	3	4	4	3	1
Stroud Road	0	0	1	0	0
Tarbuck Park	0	0	0	1	0
Tea Gardens	13	6	8	3	4
The Branch	0	1	2	0	0
Tiona	1	0	0	0	1
Tuncurry	8	5	10	6	1
Upper Myall	0	0	1	0	0
Wallingat	2	2	1	2	2
Wallis Island	0	0	0	1	0
Wallis Lake	0	0	2	1	0
Wards River	1	0	2	0	2
Washpool	0	1	2	1	0
Weismantels	0	0	1	0	0
Wootton	2	1	0	5	0
Total	**134**	**110**	**112**	**84**	**63**

Table 6.1.3 Type of Development referrals to the Natural Systems section

No of DA Referrals to Natural Systems					
Development Type	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
Single dwellings	55	31	26	25	26
Multiple dwellings	21	11	4	7	6
Residential or Rural Residential Subdivision	17	19	15	5	3
Sheds/ Garages	7	5	6	14	1
Rural Subdivision	6	9	9	12	10
Commercial	6	3	4	3	1
Additions	4	4	11	1	1
Boundary Adjustment	3	8	7	3	2
Tourist Development	2	2	5	1	2
Industrial Development	0	0	4	1	2
Swimming Pool	2	1	0	0	1
Aged Care	2	1	0	2	0
Fence	0	0	4	0	1
Recreational Activities	2	3	0	0	1
Agriculture	1	0	0	1	0
Driveway/ Road	1	3	1	0	1
Carpark	0	0	2	0	0
Place of Worship	1	0	0	0	1
Poultry/ Turkey Shed	1	0	1	0	0
Aquaculture	0	1	0	1	1
Boat Ramp/ Jetty	0	2	7	4	2
Filling of Land	0	2	0	0	0
Landscaping/ Landscape Mound	0	1	3	1	0
Mining/ Extraction	0	2	0	0	0
Tall Building	0	1	0	0	0
Other	3	1	3	3	1
Total	**134**	**110**	**112**	**84**	**63**

Table 6.1.4 Ecological reporting and outcomes for DAs referred to Natural Systems

Ecological Reporting and outcomes	04/05	05/06	06/07	07/08	08/09
No/ Percentage of DA's requiring no specific ecological reporting	90 (66.7%)	82 (74.5%)	88 (78.6%)	63 (75.0%)	51 (81.0%)
No/ Percentage of DA's requiring/ provided with an Assessment of Significance	44 (32.6%)	28 (25.5%)	23 (20.5%)	19 (22.6%)	12 (19.0%)
No/ Percentage of DA's requiring an SIS	0 (0.0%)	1 (0.9%)	0 (0.0%)	2 (2.4%)	0 (0.0%)
No/ Percentage of DA's requiring an EIS	1 (0.7%)	0 (0.0%)	1 (0.9%)	0 (0.0%)	0 (0.0%)
No/ Percentage of DA's approved with no ecological conditions	23 (17%)	18 (16.4%)	21 (18.8%)	10 (11.9%)	3 (4.8%)
No/ Percentage of DA's approved subject to specified ecological conditions	90 (66.7%)	71 (64.6%)	82 (73.2%)	58 (69.0%)	53 (84.1%)
No/ Percentage of DA's where assessment was deferred pending the provision of additional information	9 (6.7%)	12 (10.9%)	6 (5.4%)	4 (4.8%)	5 (7.9%)
No/ Percentage of DA's recommended for refusal by the Natural Systems Branch on ecological grounds	11 (8.1%)	9 (8.2%)	3 (2.7%)	3 (3.6%)	2 (3.2%)
No of DA's assessed as State Significant Developments	No data	3	3	8 (9.5%)	2
No of DA's assessed in the NSW Land and Environment Court	1 (0.7%)	3 (2.7%)	4 (3.6%)	1 (1.2%)	1

Table 6.1.5 Referred DAs relating to Threatened Species

Threatened Species	04/05	05/06	06/07	07/08	08/09
No/ Percentage of DA's involving land known or found to contain habitat of an endangered ecological community	2 (1.5%)	14 (12.7%)	10 (8.9%)	7 (8.3%)	17 (26.9%)
No/ Percentage of DA's involving land known or found to contain the habitat of an endangered population	2 (1.5%)	7 (6.4%)	3 (2.7%)	4 (4.8%)	5 (7.9%)
No/ Percentage of DA's involving land known or found to contain threatened flora or fauna species	20 (14.8%)	23 (20.9%)	13 (11.6%)	13 (15.5%)	10 (15.9%)
No of DA's where the following species, populations or communities were detected:					
Asperula asthenes	1	1	0	0	0
Lindernia alsinoides	0	0	0	1	0
Syzygium paniculatum	0	0	1	0	0
Tetratheca juncea	0	0	0	0	1
Brush-tailed Phascogale	2	6	0	1	0
Koala	5	6	4	4	2
Yellow-bellied Glider	0	3	0	0	2
Squirrel Glider	4	4	4	6	5
Grey-headed Flying Fox	6	8	1	2	2
Eastern Blossom Bat	0	0	0	1	0
Yellow-bellied Sheathtail Bat	0	1	0	1	0
Eastern Freetail Bat	4	5	2	2	1
Eastern False Pipistrelle	0	1	0	2	2
Greater Broad-nosed Bat	1	5	1	1	3
Little Bent-wing Bat	2	8	2	4	1
Large Bent-wing Bat	2	4	1	1	0
Southern Myotis	0	1	1	0	0
Eastern Cave Bat	0	2	1	1	0
Wallum Froglet	0	2	1	1	2
Osprey	1	2	2	1	2
Wompoo Fruit-dove	0	0	0	0	1
Glossy Black Cockatoo	6	10	4	1	2
Powerful Owl	0	4	0	1	1
Barking Owl	0	1	0	0	0
Masked Owl	2	2	0	2	0
Grass Owl	0	0	0	1	0
Hawks Nest/ Tea Gardens Endangered Koalas	2	7	3	4	5
Subtropical Coastal Floodplain Forest EEC	0	0	0	2	4
Swamp Oak EEC	0	7	6	4	3
Swamp Sclerophyll Forest EEC	0	5	3	2	5
Saltmarsh EEC	0	3	4	0	0
Littoral Rainforest EEC	0	3	3	1	2
Lowland Rainforest EEC	0	0	0	1	7
Themeda Grassland EEC	0	1	0	0	0

The following table gives an indication of the area of land occurring within each zoning in the Great Lakes LGA. These zones determine what developments can and cannot take place in certain areas and represent an important method of strategic planning. Over time, reporting this information will indicate the growth or decline of important zones such as 7a1 Environmental Protection. Please note that some figures recorded may appear inaccurate as they have been sourced from planning documents that have not been progressively updated to reflect changes in tenure (for example, the area of National Parks is known to be larger than the area represented in zone 8 and the area of Open Space reported in Section 6.2 is greater than the area represented in zone 6a).

Figure 49. Development can mean the loss of important habitat for fauna

There was no data recorded for the reporting period 2004/05, therefore it has not been included in the table 6.1.6.

Table 6.1.6 Area of land contained in each zoning

Planning Zone	Area (ha) in each zone 2005/06	Area (ha) in each zone 2006/07	Area (ha) in each zone 2007/08	Area (ha) in each zone 2008/09
1(a) Rural	199,403	195,585	195,584	195,255
1(c) Future Urban Investigation	3,603	2,259	2,176	2,163
1(d) Small Holdings	1,239	1,363	1,363	1,372
1(d1) Rural Residential	54	54	54	107
1(f) Forestry	74,080	78,460	78,460	78,357
2 Village	1,251	1,252	1,244	1,263
2(a) Low Density Residential	981	981	981	973
2(b) Medium Density Residential	150	151	151	150
2(c) High Density Residential	38	38	38	38
2(f) Mixed Residential-Commercial	208	206	206	206
2(g) Environmental living/ low impact development	-	34	34	34
3(a) General Business	34	34	34	35
3(d) Special Business Waterfront	6	6	6	6
4(a) General Industrial	82	82	82	83
5(a) Special Uses	207	215	214	214
5(c) Local Road Reservation	10	9	9	4
5(d) Arterial Road Reservation	-	-	-	-
6(a) Open Space	541	572	572	575
7(a) Wetlands & Littoral Rainforest	3,508	2,484	2,484	2,496
7(a1) Environmental Protection	110	144	220	233
7(b) Conservation	5,383	6,648	6,649	6,659
7(c) Scenic Protection	1,864	1,860	1,860	1,857
7(f1) Coastal Lands Protection	391	558	558	557
7(f2) Coastal Lands Acquisition	62	63	63	63
8(a) National Parks & State Recreation	34,349	34,312	34,567	34,507
8(b) National Parks & State Recreation Areas	184	446	191	191

Table 6.1.7 Strategic Plans in Progress

Project	Location	Area of land rezoned from 1 (c)* or unspecified to Environment Protection (ha)	Area of land rezoned from 1 (c)* or unspecified to Residential/Rural Residential/ Industrial etc (ha)	Status
LEP No. 27 & 50	North Hawks Nest	500	90	LES, Draft LEP & Voluntary Planning Agreement currently on exhibition.
LEP No. 46	South Forster	7	23	Draft LES / LEP being prepared
LEP No. 47	Smiths Lake	4.5	5.5	LEP gazetted
LEP No. 36	Forster	9	19	Voluntary Planning Agreement to be re-exhibited
LEP No. 13	Pacific Palms - Stage 2	350	17	Revised LEP being prepared
LEP No. 62	Various	1,155	Nil	Pending gazettal
LEP No. 76	North Tuncurry	130	30	Pending gazettal
LEP No. 52	South Forster	7	20 (approx)	Pending exhibition
LEP No. 72	Tropic Gardens Drive	23	9	Draft LES being prepared
LEP No. 70	North Shearwater	65	56	LES exhibited
LEP No. 79	South Forster (Various)	Not yet determined	Not yet determined	Studies being prepared
LEP No. 23	Myall River Downs	Not yet determined	Not yet determined	Draft LES being prepared

Trend Analysis

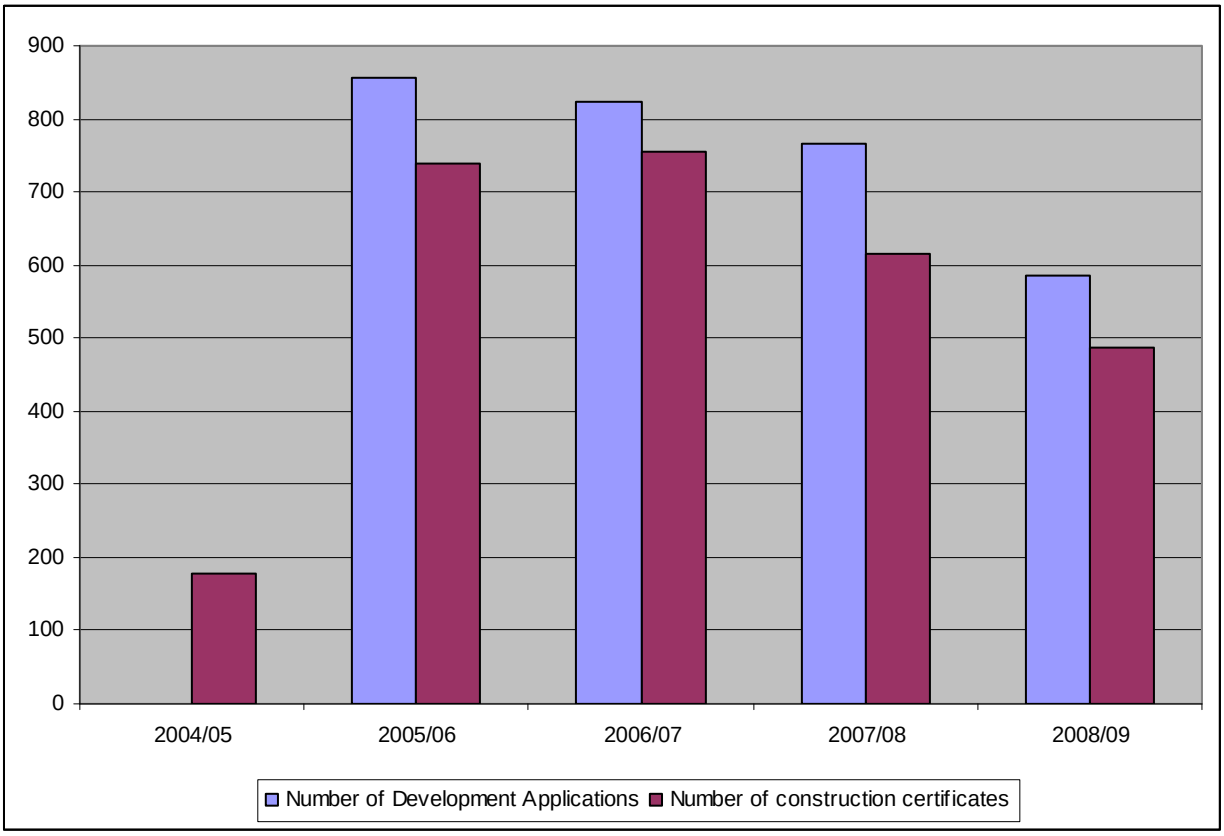


Figure 50. The number of development applications and construction certificates

The chart above (Figure 50) shows a steady decline in the number of DA's and Construction Certificates processed by Great Lakes Council, over the entire 5 year reporting period. No data was available for DA's for 2004/05.

As a result of this there has also been a decline in the amount of DA's that are referred to the Natural Systems section of Council for special environmental considerations (see Figure 51).

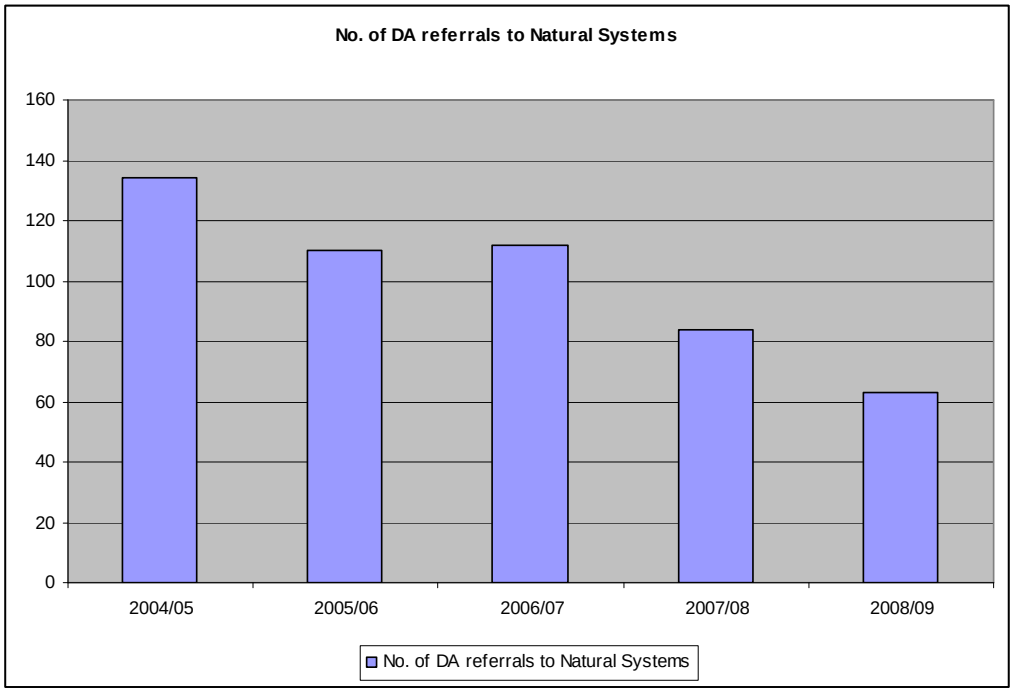


Figure 51. The number of DA's referred to the Natural Systems Section

Response

Council currently has a number of strategic plans in place to manage development. Strategic landuse planning is the forward planning which provides an overall sense of direction and a context for detailed decisions that councils and state agencies make in relation to future land use and service provision. A strategic plan outlines a vision for the future development of a region or locality and a strategy to achieve it.

Strategic planning can be done for part of, or the entire local government area (LGA). Strategic plans sit at the top of the planning hierarchy and set the overall "big-picture" with consistent aims, objectives and guiding principles. Local Environmental Plans (LEP) allows the strategic plans to be implemented by setting rules for the development of specified land. Finally, Development Control Plans (DCP) outline the detailed development outcomes of subject areas.

More detailed information on Strategic Plans and Local Environmental Plans is available from Council Offices and Council's website.

Summary and Future Directions

Inappropriate development is a key threat to the health of our local environment and needs to be monitored carefully.

There is an identified need to establish a small working group and re-formulate internal Council reporting and data management procedures so that development statistics are accurately reportable. There is also a need to formulate a clear process and procedure to ensure that all developments that concern environmental factors are given adequate consideration by the appropriate environmental staff in council.

Table 6.1.8 Identified need for action regarding land development

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Develop and implement a policy for ecological considerations in development assessment planning that includes standard survey and assessment guidelines, standard ecological conditions and codes of practice/ design considerations for pertinent ecological features	• Develop a policy/direction for Development Assessment advice	Natural Systems	N	Within 2yrs

6.2 Open Space

Introduction

As part of Councils community responsibility, adequate amenities and services are required under the *Environmental Planning and Assessment Act 1979*. As such, Council levies contributions for the acquisition of land for 'open space'. Open space is necessary for environmental and social wellbeing and includes drainage and service corridors, general land, natural areas (foreshore, bushland, and wetland etc.), parks, sporting grounds, areas of cultural significance and general use community areas.

Figure 52. One Mile Beach, Forster

Environmentally, drainage and natural open space are of significance as they provide opportunity for conserving and protecting biodiversity as well as managing and treating run-off through constructed wetlands and drainage reserves. Council reserves provide habitat for native fauna and facilitate active and passive recreation as well as scientific and educational activities. Hence open space is a very important local resource.

Monitoring

Council's Parks and Recreation section provides information in relation to the total area of open space across the LGA.

Results

The Draft Recreation and Open Space Strategy states that the Great Lakes LGA has **746ha** of Open Space with 69% of this being areas of foreshore, water course or wetland reserves. This equates to around 22ha of Open Space per 1000 people. There has been no significant change in this figure since the last reporting period.

Trend Analysis

Not applicable for this report.

Summary and Future Directions

Councils Parks and Recreation section has developed a Draft Recreation and Open Space Strategy (ROSS).The ROSS suggests that Great Lakes residents are relatively well serviced with open space. It concludes that current recreation and open space demands are being met. It also concludes that there is likely to be an increase in demand for embellishment rather then an increase in the amount of open space.

Following the adoption of this Strategy, an effective protocol shall be developed to routinely monitor the changes and extent of open space (including the consideration of different types of open space) in a rational and effective manner.

In general it would be beneficial to see a rationalisation in the area of open space per capita over time however development and population pressures may threaten this.

6.3 Roads

Introduction

The construction and use of roads, even when sensitively designed, can significantly impact on the local environment. A number of issues which may arise due to road development include:

- Chemical and noise pollution
- Fragmentation of wildlife habitat
- The formation of barriers to wildlife movement and dispersal
- Mortality of wildlife through collisions with vehicles
- Impact on the aesthetic value of an area
- Pollution issues during construction and use
- Vegetation removal
- Degradation of natural patterns and processes eg. erosion
- The spread of weeds and feral pests

Figure 53. Roads, such as the Pacific highway, greatly damage and fragment habitat

As such, where possible the construction of roads should be minimised and where road development is essential, all of the above issues need to be considered and resolved to ensure minimal impact on the local environment.

Monitoring

Records are available within the Transport Assets section of Council's Engineering Division, on an annual basis, in relation to the total length and area of urban, rural and regional roads that are maintained by Council. This data also provides a record on the proportion of unsealed and sealed roads in the LGA.

The intent of this indicator is to monitor the construction and quality of roads within urban, rural and regional areas of the LGA.

Results

In total the Great Lakes LGA contains **1,109 km** of council controlled roads. Table 6.3.1 identifies the proportion of the road network that is unsealed.

Table 6.3.1: Total length and area of Council maintained roads and proportion of unsealed roads.

	04/05	05/06	06/07	07/08	08/09
Urban Road Length (km)	269	257	261	259	259
Proportion Unsealed of Urban Road Length	9%	7.4%	7.7%	6.5%	6.5%
Rural Road Length (km)	640	698	706	697	704
Proportion Unsealed of Rural Road Length)	66%	66%	64.8%	64.1%	64.6
Regional Road Length (km)	165	158	157	157	146
Proportion Unsealed of Regional Road Length)	0%	0%	0%	0%	0%
Total Road Length (km)	**1074**	**1113**	**1124**	**1113**	**1109**
Total Proportion of unsealed length	**41%**	**43%**	**42.5%**	**41.6%**	**42.5%**
Total Road Area (m^2)	**6043209**	**6059389**	**7023937**	**6059389**	**6862200**
Total Proportion of Unsealed Area	**29%**	**32%**	**34%**	**32%**	**33%**

Source: Great Lakes Council. Please note: road network was remeasured in 2005.

Trend Analysis

There have been no significant changes in road length or proportions over the entire reporting period, and as such, no trend analysis will be performed.

Summary

Sealed roads occupy the majority of the total Council controlled road network in relation to both total road length and total road area. However a significant length of unsealed roads is present in this LGA, particularly in rural areas. Some figures over the four years have fluctuated, for example the urban road length figures. This is due to changes or discrepancies in measured road lengths and classification, rather than an actual road length decrease and increase.

Response and Future Directions

Council is aware of the environmental impacts of roads, in particular the impacts of unsealed roads (for example erosion and sedimentation of waterways and drainage lines). Council currently has a rolling program in place to seal all urban unsealed roads over a twenty year period from 1998. This is part of the Urban Road Construction Program.

The Rural Road Construction Program has resulted in the sealing of two rural roads (Warri Street and Clarke Street). As part of this program sealing has commenced on Bundabah Road and Seal Rocks Road, and sealing of Bombah Point Road and Willina Road is planned.

Sections of gravel roads have been subjected to best practice erosion control methods during the reporting period, including roads in the Karuah River and Wallis Lake catchments. Erosion and sediment control is now a major factor in the design and construction of roads and streets. New roads in urban subdivisions are required to be bitumen sealed.

Table 6.3.2 Identified Needs for Action Regarding Roads

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Develop plans and procedures for managing and reducing environmental impacts during road maintenance (Roadside environmental management plans/strategies).	Roadside Environmental Management Plan (progress development)	Engineering Services	Y	Within 2yrs

7 Air

The quality of the air we breathe has always been a contentious issue in Australia. Through a deterioration of air quality, the health of the community can be compromised and the sustainability of our lifestyles and economies can be negatively impacted.

Figure 54. Car exhaust emits pollution into the atmosphere.

Air quality within the Great Lakes is comparatively good due to the area's low population base and minimal industrial operations. However, residents of the Great Lakes contribute to the overall deterioration of the world's atmosphere through the electricity we use, the cars we drive, the wood we burn in our heaters, etc. Of great concern is climate change and the amount of carbon we contribute to the atmosphere. The predicted effects of global warming would have a significant impact on our infrastructure, the environment and our lifestyles. This would be due to the predicted occurrences of sea level rise and altered climate (increased storms, etc).

7.1 Electricity Usage and Green House Gas Emissions

Introduction

Burning fossil fuels such as coal for the generation of electricity has been identified as a major contributor to global warming. During the generation process carbon dioxide, a greenhouse gas, is emitted. Naturally carbon dioxide is an essential part of the atmosphere. However in excessive amounts carbon dioxide can overheat the earth. This warming has the potential to drastically alter natural systems to the point where plant and animal species are unable to adapt to the new conditions and may die out. There is also the risk that melting polar ice caps will cause higher sea levels that could greatly impact on coastal regions such as the Great Lakes.

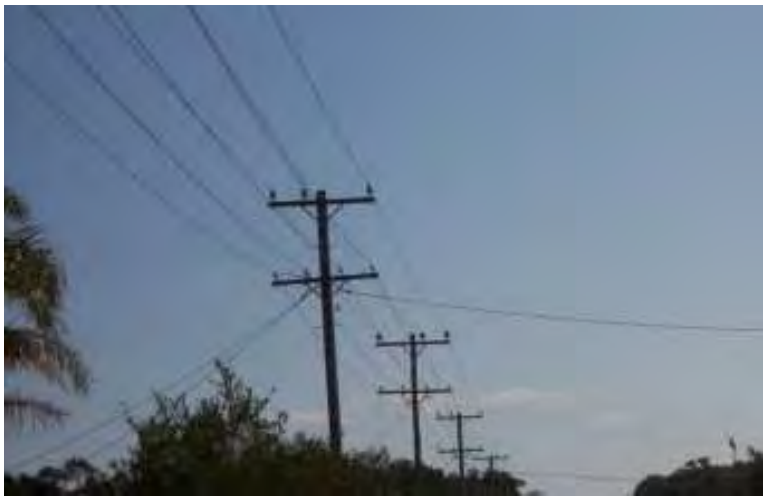


Figure 55. Burning fossil fuels for electricity contributes to global warming

Due to the impact of energy generation on the environment and the non renewable nature of fossil fuels, renewable sources of energy such as wind, tidal and solar power are being investigated globally. Until such time as alternate sources of energy become widely available it is essential that energy use be kept to a minimum to reduce the effect of carbon dioxide on the environment.

Monitoring

Overall greenhouse gas emission from electricity usage within the Great Lakes is relatively low due to our small population size. Information in relation to energy sources, usage and emission of greenhouse gas within domestic and commercial premises is available from the regional electricity authority, Country Energy.

Results

The table below shows the breakdown of energy consumption in the Great Lakes LGA.

Table 7.1.1 Energy consumption for Great Lakes LGA

Year	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Residential energy usage (MWhs)	No data	128,385	112,930	119,447.6	121,225
Commercial energy usage (MWhs)	No data	81,334	93,804	83,340.2	82,618
Total MWh's	**No data**	**209,719**	**206,734**	**202,787.8**	**203,843**
Residential CO2 produced (tonnes)	No data	135,318	111,236	127,092.2	128,498
Commercial CO2 produced (tonnes)	No data	85,726	92,397	88,674.0	87,575
Total CO2 tonnes	**No data**	**221,044**	**203,632**	**215,766.2**	**216,073**

Source: Country Energy

The table above shows the Great Lakes LGA used **203 843 Mega Watt hours** of electricity over the reporting period and produced **216 073 tonnes** of carbon dioxide by using this electricity. Table 7.1.1 shows that this year there has been a slight increase in the amount of Mega Watt hours used in the Great Lakes. This has also resulted in an increase in carbon dioxide emissions.

Trend Analysis

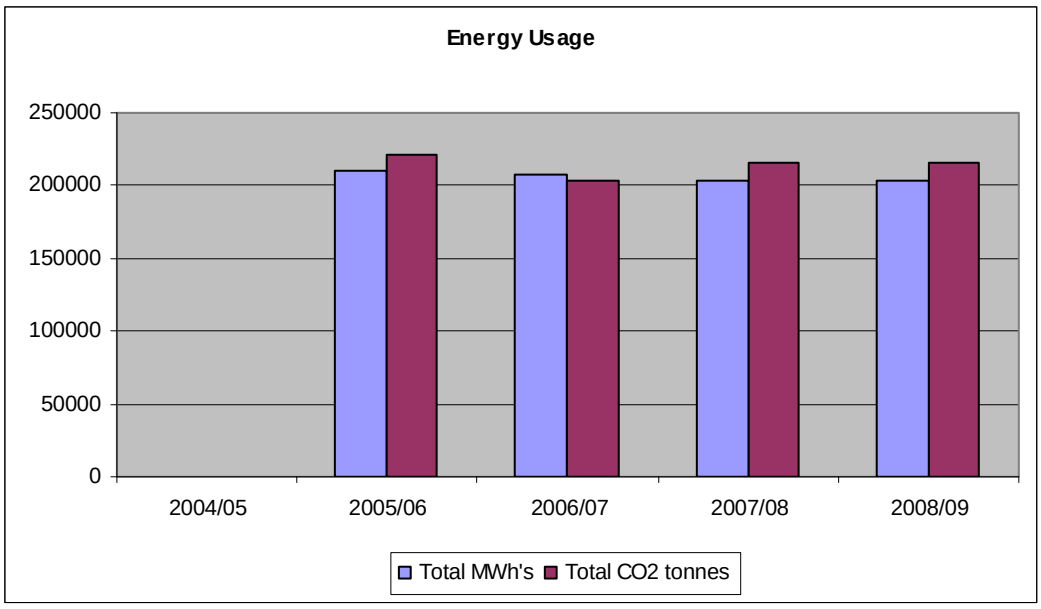


Figure 56. Total energy usage and CO2 emissions for the Great Lakes LGA

As Figure 56 shows, there has been only relatively small changes in the amount of energy used and the carbon emitted. There is no data for the period 2004/05 which limits the trend analysis.

Response and Future Directions

There is growing evidence indicating that coal powered electricity is unsustainable and detrimentally effects our environment, particularly through global warming and climate change. All sectors of society need to take action to reduce unsustainable electricity consumption including residents, business and government.

During the reporting period, and in line with the previous recommendation from last years SoE report, Great Lakes Council has developed a Sustainability Strategy that will address energy consumption for all of council operations. Energy audits have been conducted at all major council buildings, the results of which will feed into the development of policy for all of council.

Table 7.1.2 Identified Needs for Action Regarding Electricity Usage and Green House Gas Emissions

Identified Need for Action	Recommended key projects or actions for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Develop indicator to include greenhouse emissions from other sources eg. Car use, food production.	• Commence and implement Cities for Climate Protection program	Natural Systems	Partial	Within 2yrs
Attempt to formulate policy and action such that Council operations and decision making progress towards being carbon neutral	• Commence and implement Cities for Climate Protection program	Natural Systems	N	Within 5yrs

8 Noise

Noise pollution can disturb our work, concentration, relaxation and sleep. It can cause stress and create or worsen physical problems such as high blood pressure, chronic exhaustion and heart disease. A quieter environment is a restful place that promotes relaxation and a happier and healthier community.

Within the Great Lakes premises/ activities that create potential excessive noise are regulated through the DA process. Furthermore Council addresses separate noise complaints in accordance with the POEO Act. Therefore noise generation is not considered a viable indicator of environmental trends at this time. As such, no indicators for this theme are deemed relevant to Council's SoE process at this time.

9 Heritage

The NSW Heritage Act 1977 defines environmental heritage as being 'those places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance'. Two key pieces of legislation, the National Parks and Wildlife Act 1974 and the Environmental Planning and Assessment Act 1979, protect Aboriginal heritage within the Great Lakes LGA.

9.1 Non- Aboriginal Heritage

Introduction

Sites of natural and cultural heritage significance are subject to pressures from development and urbanisation, particularly where developments are proposed or take place immediately in the vicinity of such heritage items. Heritage items are also subject to environmental and additional anthropogenic pressures depending on their nature and tenure.

Monitoring & Results

Council's Strategic Planning section has compiled a Great Lakes Heritage Study, which was adopted by Council in May 2007. The study, which has been developed with the aid of the community, identifies items of heritage significance and heritage conservation areas. The study is based on guidelines issued by the NSW Heritage Office for community based heritage studies and lists **354** heritage items, including contributory items. Items of contributory significance have been identified as having heritage significance but after consideration have not been recommended for individual heritage listing.

Figure 57. Pilot Hill, Forster is listed as a place of local historical importance - maritime shipping

Table 9.1.1 below lists 19 items of natural heritage significance, and their respective identifier codes, which have been listed within the Great Lakes Heritage Study.

Table 9.1.1 Natural Heritage Items

Location	Heritage site
BULAHDELAH	1. Bulahdelah Mountain also known as the Alum Mountain (Bu04) - Includes the Underground Rock Orchid, Rock Orchid - Dendrobium species, Aboriginal Scarred Trees, and the Alum Mountain Park.
CARRINGTON	2. Three Moreton Bay Fig Trees on waterfront near oyster lease (Ca13) - (contributory item only).
	3. Tahlee House grounds and gardens (Ca10) - Important relics of early garden and landscape styles.

FORSTER	4. Waterfront, Little St, waterside vegetation, the 'little baths' and concrete block from Albert von Ehlefeldt's shop and bakery wharf - (Fo08) - Includes important remnants of remaining littoral vegetation.
	5. Forster Breakwater (Fo08) - Of maritime shipping historical importance.
	6. Pilot Hill, Forster (Fo09) - Of maritime shipping historical importance as well as important open space reserve, local landmark and geographical feature.
	7. Cape Hawke Drive, Reynolds Hill (Fo17) - Includes Moreton Bay Fig.
NABIAC	8. Dwelling including Canary Island Palms (Na04) - Mature Canary Island Palms with conspicuous streetscape element.
SEAL ROCKS	9. Blowhole (SR09) - possibly of Aboriginal significance. Further investigation by NPWS required (contributory item only).
STROUD ROAD	10. Washpool, near Washpool Bridge (SD03) - Important site from Australian Agricultural Company days but no physical evidence remains other than the pool (also listed as an item of heritage significance in Great Lakes LEP 1996).
TEA GARDENS/ HAWKS NEST/ WINDA WHOPPA	11. Large fig tree near 59 marine Drive and large fig tree outside Police Residence, 51 Marine Drive (TG17) - Strong streetscape value. The first item in particular is an excellent example of its type. Both appear to be native to the area.
	12. Norfolk Island pines near 45 - 47 Marine Drive (TG34) - Prominent streetscape elements and historically popular and significant planting in seaside and riverbank localities (one suffering dieback). 13. Norfolk Island pines, 38 The Anchorage, Winda Woppa (HN06) - Significance as a landmark and historic navigational point. 14. Memorial Park (TG36) - War memorial park and entrance gates.
TIONA	15. The Green Cathedral including adjacent wharf remains (Ti01) - Important for social and historical reasons as the Great Lakes area's first and only outdoor cathedral.
TUNCURRY	16. John Wright Park including Norfolk Pines (Tu08) - Important association with the Wright family. Important landscape waterfront element.
	17. Memorial Park (TU14) - Important open space and visual element of the proposed Tuncurry Heritage Conservation Area.
	18. Six Canary Island palms on Taree St and at Tokelau (Tu10) - Conspicuous streetscape elements that enhance the proposed Tuncurry Heritage Conservation Area's historical significance.
	19. Norfolk Island Pines, Tokelau (TU11) - Conspicuous streetscape elements that enhance the proposed Tuncurry Heritage Conservation Area's historical significance.

The Heritage Study, including the location of heritage items can be viewed on Council's website, or alternately can be purchased at Council's Offices upon request.

9.2 Aboriginal Heritage

Introduction

Similarly to natural and cultural heritage items, sites of Aboriginal heritage are also subject to development and environmental pressures.

Figure 58. Aboriginal Heritage Conservation Officer, Steve Brereton delivers a cultural heritage education session at Burgess Beach open campsite

There is a legislative requirement for Councils to consider items and sites of Aboriginal cultural significance in their decision making processes. As such, archaeological investigations are commonly required as supporting material for Development Applications, Local Environmental Studies and Reviews of Environmental Factors. The management/ conservation of Aboriginal cultural sites is often a complex issue that entails such considerations as adequate site protection, cultural sensitivities, etc.

Monitoring

Aboriginal Site management is principally the responsibility of the Department of Environment, Climate Change and Water (DECCW), with the assistance of the relevant Local Aboriginal Land Council/ Aboriginal community. An Aboriginal Heritage Information Management System (AHIMS) is administered by DECCW with respect to Aboriginal Sites. The AHIMS includes a database and recording cards for all Aboriginal objects, Aboriginal places and other Aboriginal heritage values in NSW that have been reported to the NPWS in addition to a database index of archaeological reports and a library of these reports.

Previous SoE reports had attempted to include an indicator on Aboriginal sites and their management (protection, destruction, etc). However, considering that much of the information on Aboriginal historical sites/items is maintained by the DECCW this has proved to be beyond the scope of the SoE. As such, no indicator for Aboriginal site management has been provided in the present SoE report.

Results

The Great Lakes Heritage Study was intended to cover all aspects of European cultural and natural heritage. During the preparation of the study a number of Aboriginal sites/items were brought to the attention of Council. These items were included in the study to ensure their ongoing protection, notwithstanding that DECCW (under the National Parks & Wildlife Act 1974) is the primary agency responsible for the identification and listing of Aboriginal items/sites of heritage significance.

Continued investigation is needed to accurately document items and sites of Aboriginal cultural heritage significance that have not previously been identified within the Great Lakes area by either DECCW or Council.

Summary and Future Directions

This SoE has identified the need for enhanced liaison, understanding and cooperation between Council, the Aboriginal community and the relevant government agencies to ensure that sites are appropriately managed and protected. This should occur both through proactive land management programs and through development and rezoning proposals.

To this end, Council should aim to foster and promote constructive liaison with the local Aboriginal community and establish appropriate and meaningful protocols for Aboriginal site management and protection in the Development Application process, rezonings and its own works program.

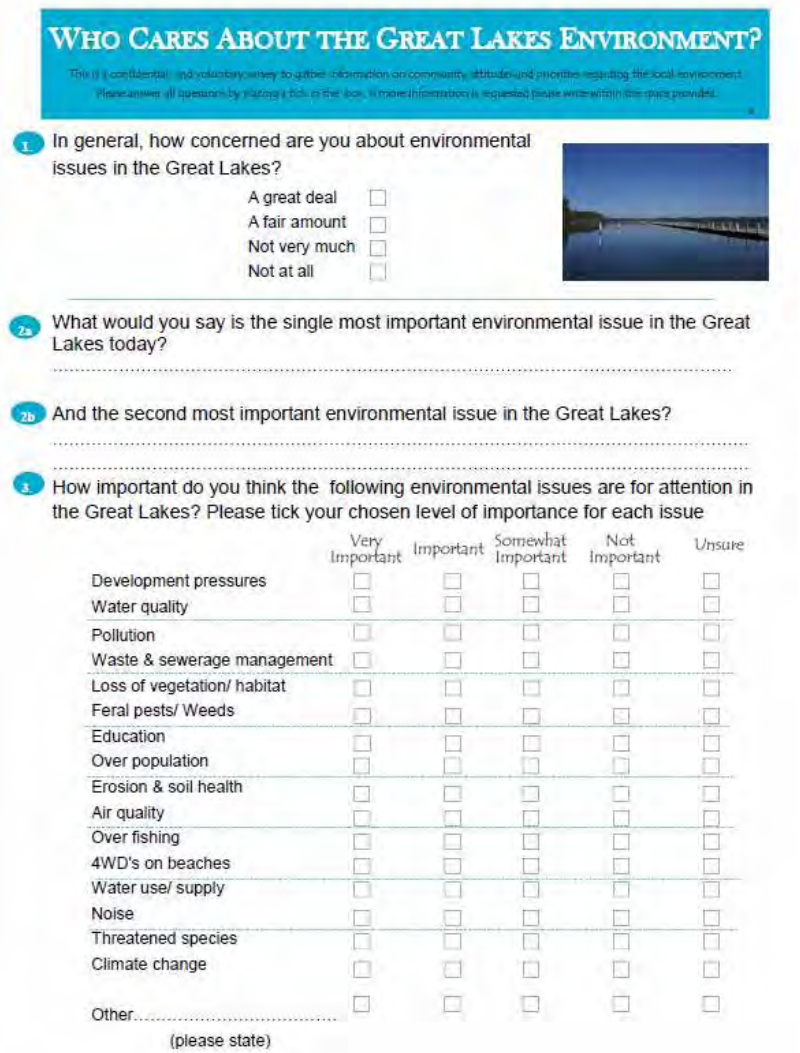
Table 9.2.1 Identified Needs for Action Regarding Aboriginal Heritage

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Investigate the employment of a Aboriginal Liaison Officer such that greater cooperation and action with respect of cultural sensitivity, liaison and opportunities can be achieved between Council and the local Aboriginal community, with respect of economic, social and environmental outcomes;	Aboriginal Liaison Officer (employment)	Council wide	N	Immediate
As part of any future review of Council's development consent processes, devise and implement an appropriate range of tools for respecting, managing and protecting Aboriginal heritage and allowing greater consultation, between Council and the local Aboriginal community, in the determination/ approvals process. Develop a framework that considers and addresses issues associated with landscape conservation with due respect to cultural sensitivities.	Collaborative Framework for consideration of Aboriginal Heritage	Council wide	N	Within 2yrs

10 Community Involvement

Community involvement is an essential component in the development of SoE reports. There is significant value in liaising with the community to gain an understanding of popular opinion on environmental issues. This process also provides an evaluation tool for Council's current environmental programs. Furthermore, often Council may not be fully aware of all environmental issues and their extent within the LGA (due to the location of offices and limited number of staff). The community has the ability to provide information on issues, which may be unnoticed as well as providing an essential public perspective on how Council should go about addressing these issues.

Community involvement has been instrumental in the development of Great Lakes Council SoE reports since 2000. Historically Council has requested interested parties, individuals and groups provide a submission to be included and addressed through the SoE process. This process has since changed with the introduction of the "*Who Cares about the Great Lakes Environment*?" survey developed in 2004. While submissions are also sourced, the survey provides for a greater cross-section of responses from all types of people living within the Great Lakes community and gives an indication of trends in levels of environmental concern and awareness.



WHO CARES ABOUT THE GREAT LAKES ENVIRONMENT?

This is a confidential and voluntary survey to gather information on community attitudes and priorities regarding the local environment. Please answer all questions by placing a tick in the box. If more information is requested please write within the space provided.

1. In general, how concerned are you about environmental issues in the Great Lakes?

- A great deal ☐
- A fair amount ☐
- Not very much ☐
- Not at all ☐

2a. What would you say is the single most important environmental issue in the Great Lakes today?

.....

2b. And the second most important environmental issue in the Great Lakes?

.....

.....

3. How important do you think the following environmental issues are for attention in the Great Lakes? Please tick your chosen level of importance for each issue

	Very Important	Important	Somewhat Important	Not Important	Unsure
Development pressures	☐	☐	☐	☐	☐
Water quality	☐	☐	☐	☐	☐
Pollution	☐	☐	☐	☐	☐
Waste & sewerage management	☐	☐	☐	☐	☐
Loss of vegetation/ habitat	☐	☐	☐	☐	☐
Feral pests/ Weeds	☐	☐	☐	☐	☐
Education	☐	☐	☐	☐	☐
Over population	☐	☐	☐	☐	☐
Erosion & soil health	☐	☐	☐	☐	☐
Air quality	☐	☐	☐	☐	☐
Over fishing	☐	☐	☐	☐	☐
4WD's on beaches	☐	☐	☐	☐	☐
Water use/ supply	☐	☐	☐	☐	☐
Noise	☐	☐	☐	☐	☐
Threatened species	☐	☐	☐	☐	☐
Climate change	☐	☐	☐	☐	☐
Other..... (please state)	☐	☐	☐	☐	☐

Figure 59. The 2009 'Who Cares About the Great Lakes Environment?' survey.

10.1 Community Survey

Methods

One hundred (100) "*Who Cares about the Great Lakes Environment*?" surveys were distributed randomly to residents across the LGA. A further 40 environmental and community groups (including Land Care groups and Progress Associations) received the survey.

Additionally, the survey was made available to interested members of the public upon request and was promoted through the media.

In total 83 surveys were returned. Of these 20 were returned from the random surveys, the remainder were completed by community groups, requested at Council offices or completed online.

The survey consisted of 13 questions, many of which were based on the NSW Department of Environment, Climate Change & Water's triennial 'Who Cares About the Environment' survey. Extra questions were included to find out more about the community's attitudes toward the local environment, their opinion of Council's environmental management and people's visions for a sustainable future. Each year this survey is slightly changed in an attempt to improve its relevance, accuracy, usability and readability. Due to the survey being slightly different from year to year and because the proportion of the community surveyed is relatively small, only limited trend analysis can be performed.

With these limitations in mind, an outline of the survey results for this year have been presented below.

Results

Please not that the results shown in the figures below represent the entire range of responses received, that being random surveys, community groups and residents.

Question 1: *In general, how concerned are you about environmental issues in the Great Lakes? (Respondents were given the following options to choose from: A great deal; A fair amount; Not very much; Not at all).*

The vast majority of respondents were concerned about the environment a 'great deal' (78%% of respondents chose this answer). 22% of respondents were concerned 'A fair amount' as shown by the graph below. There were no responses that answered either 'Not very much' or 'Not at all' (Figure 60).

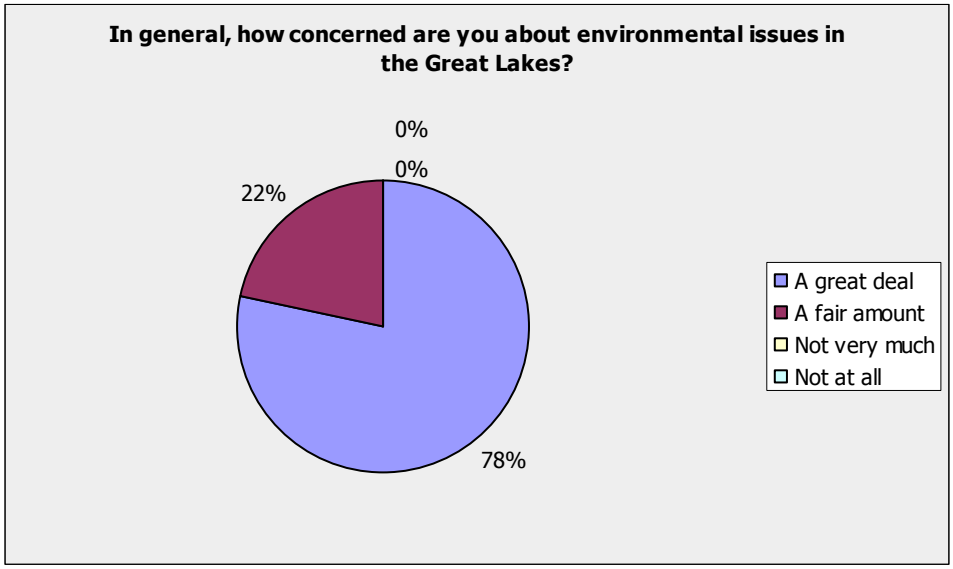


Figure 60.

Results showed that members of environmental and community groups and people that requested the survey were more likely to care 'a great deal' about the environment (83%) than randomly selected members of the community (65%)

Question 2a: *What would you say is the single most important environmental issue in the Great Lakes today?*

31% of respondents listed 'Water Quality' as the single most important environmental issue, followed by 26% listing 'development' or 'over population', and 12% listed 'loss of native vegetation/protection of biodiversity'.

Question 2b: *And the second most important environmental issue in the Great Lakes?*

21% listed 'development' or 'over population', and 'loss of native vegetation/protection of biodiversity' as the second most important environmental issue. 18% listed 'Water Quality' as the second most important environmental issue.

Question 3: *How important do you think the following environmental issues are for attention in the Great Lakes? (Respondents were asked to tick a chosen level of importance for each environmental issue listed with a choice from 'very important'; 'important'; 'somewhat important'; 'not important' or 'unsure').*

The graph below summarises the results of this question.

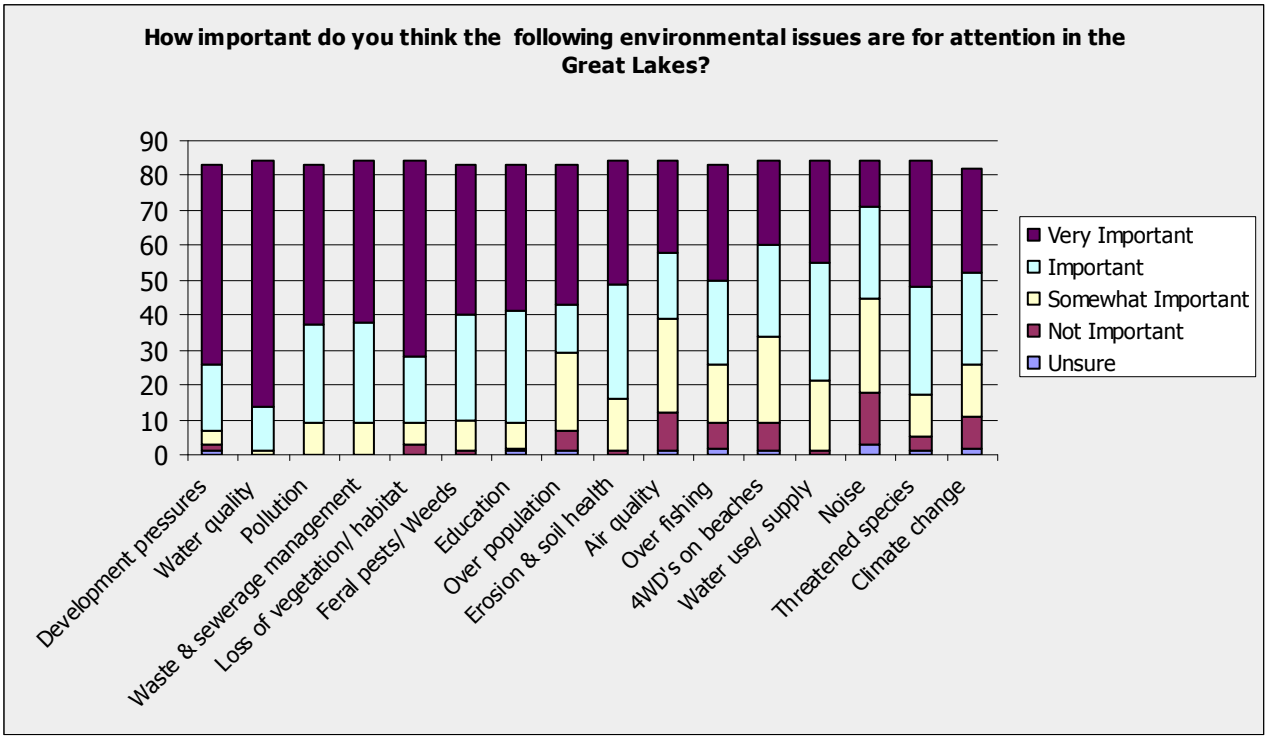


Figure 61.

The most popular environmental issue to be considered Very Important was Water Quality (83%). This is an increase from last years survey results. Development pressures was the second most popular issue to be considered Very Important (69%). Loss of vegetation/habitat were considered Very Important by 67% of the people responding to the survey (Figure 61).

Question 4: *What are your main sources of information about environmental issues in the Great Lakes? (Respondents were given a list of possible sources and asked to tick as many as applicable).*

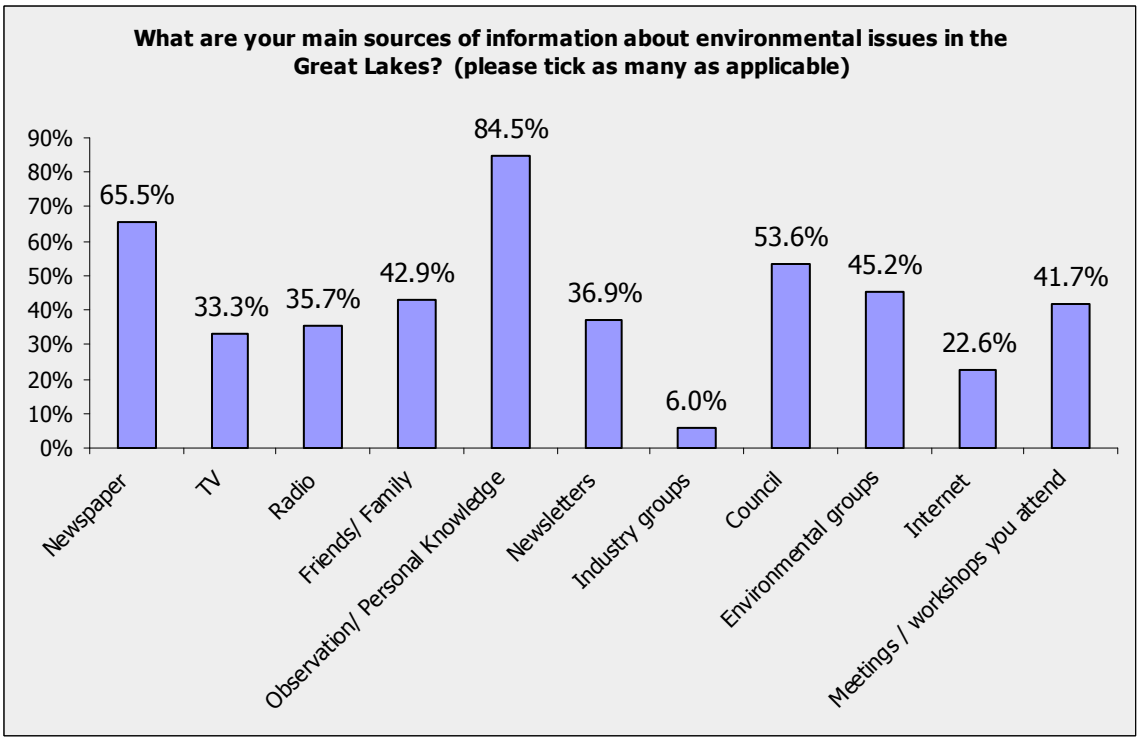


Figure 62

The majority of respondents reported obtaining their environmental information from observation/ personal knowledge (84.5%) newspaper (65.5%), and Council (53.6%), and environmental groups (45.2%), see Figure 62. Respondents from community groups and people that requested the survey were much more likely to get their environmental information through environmental groups, council and newsletters that randomly selected members of the community were.

***Question 5**: How healthy do you think each of the following elements of your local environment are?*

The graph below (Figure 63) summarises the results of this question. It shows that over 50% of respondents consider most of the elements of our natural environment to be adequately healthy or very healthy (with 'adequate being the most popular answer for all environmental elements). However this year, the category 'Urban Centres' showed a high ranking of 34% of respondents answering 'unhealthy'.

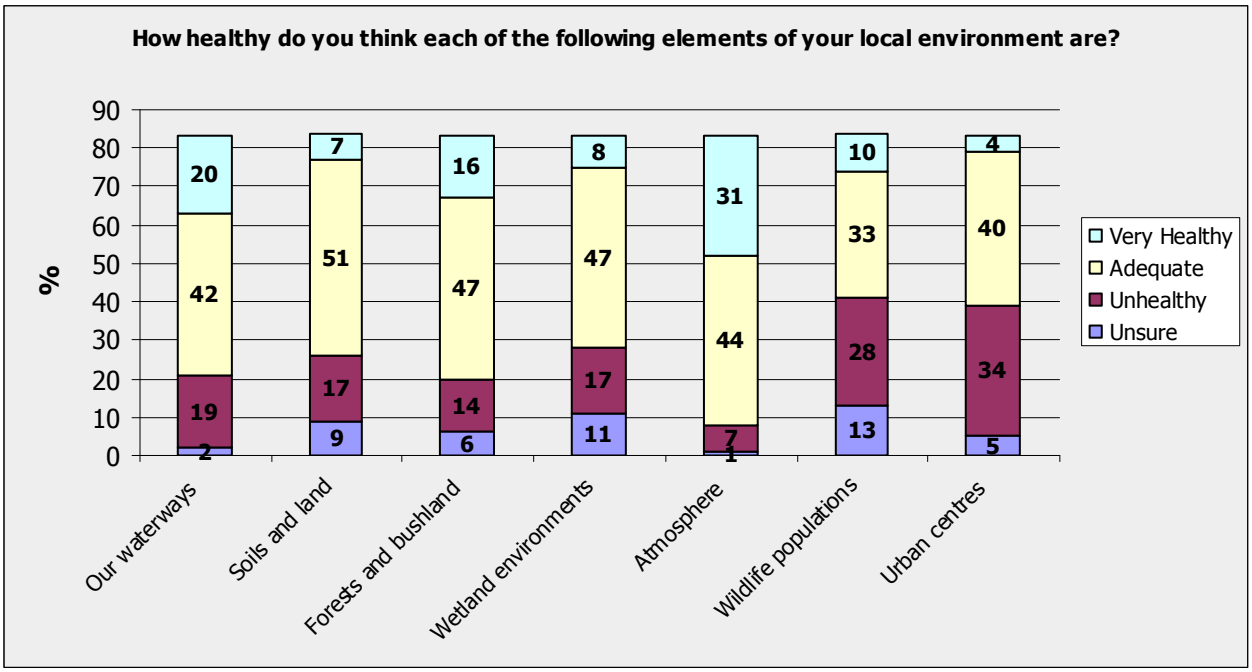


Figure 63

Question 6: *Have you heard of the following Great Lakes Council initiatives? (Respondents were given a list of plans and projects and asked to tick yes or no for each)*

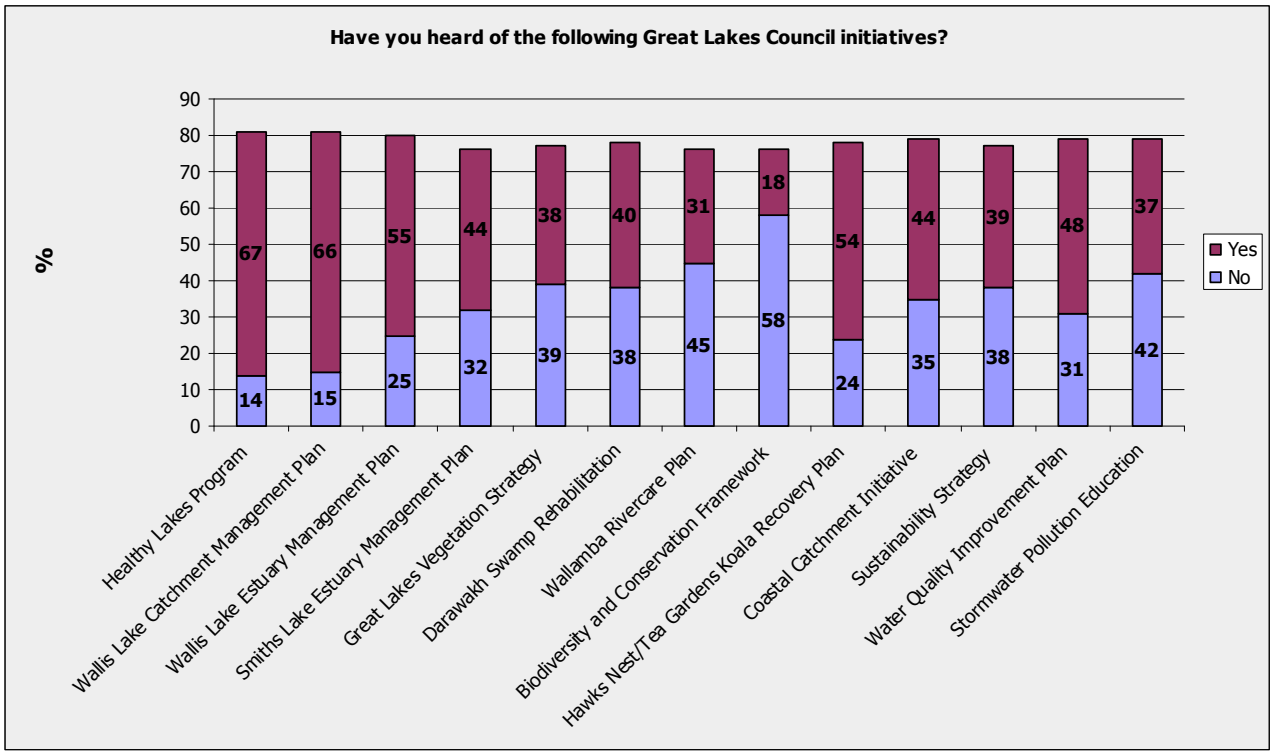


Figure 64

This year the Wallis Lake Catchment Management Plan and the Healthy Lakes Program (Figure 64) are shown to be the most known initiatives (same result as last three years).

Question 7: *How satisfied are you with Council's current management of the environment?*

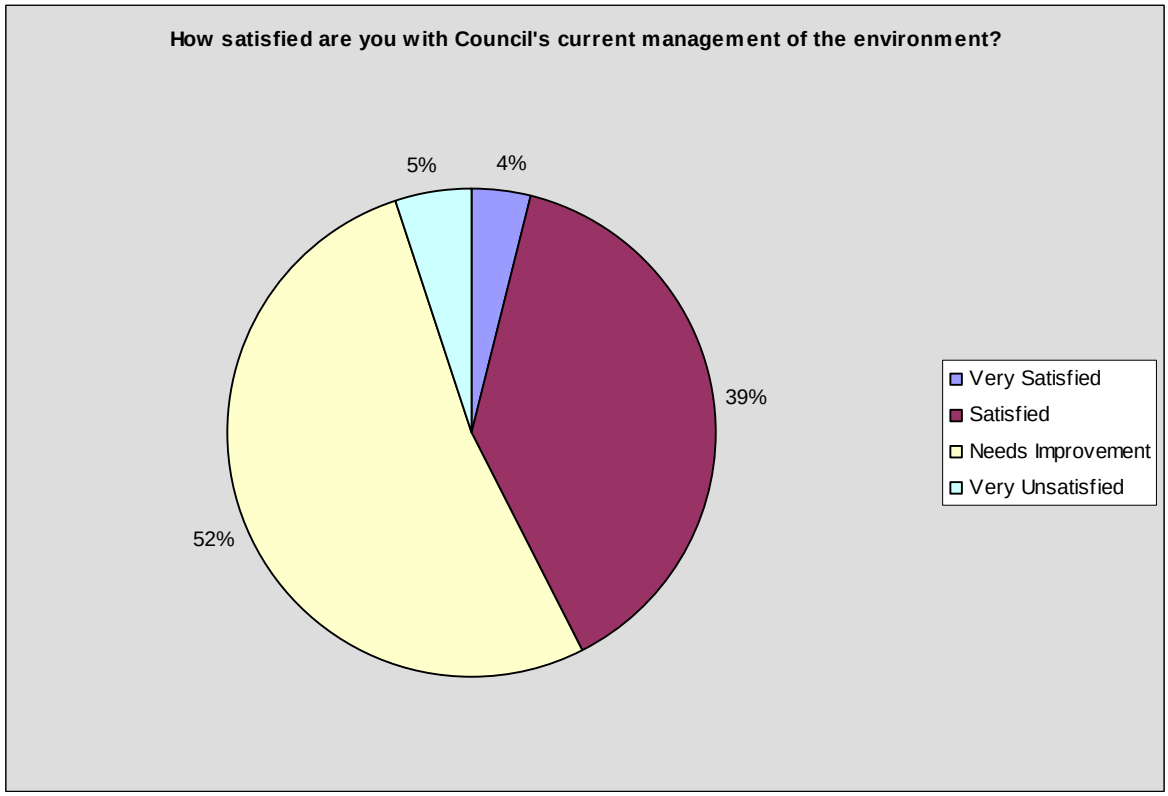


Figure 65

52% of respondents suggested Council needs to improve their management of the environment, as shown by the graph above. 43% were either satisfied or very satisfied, whilst 5% were very unsatisfied (Figure 65).

Question 8: *How important is it for council to use the following environmental management strategies? (Respondents were given a list of strategies and were asked to rate them as 'very important'; 'important'; 'somewhat important'; 'not important' or 'unsure')*

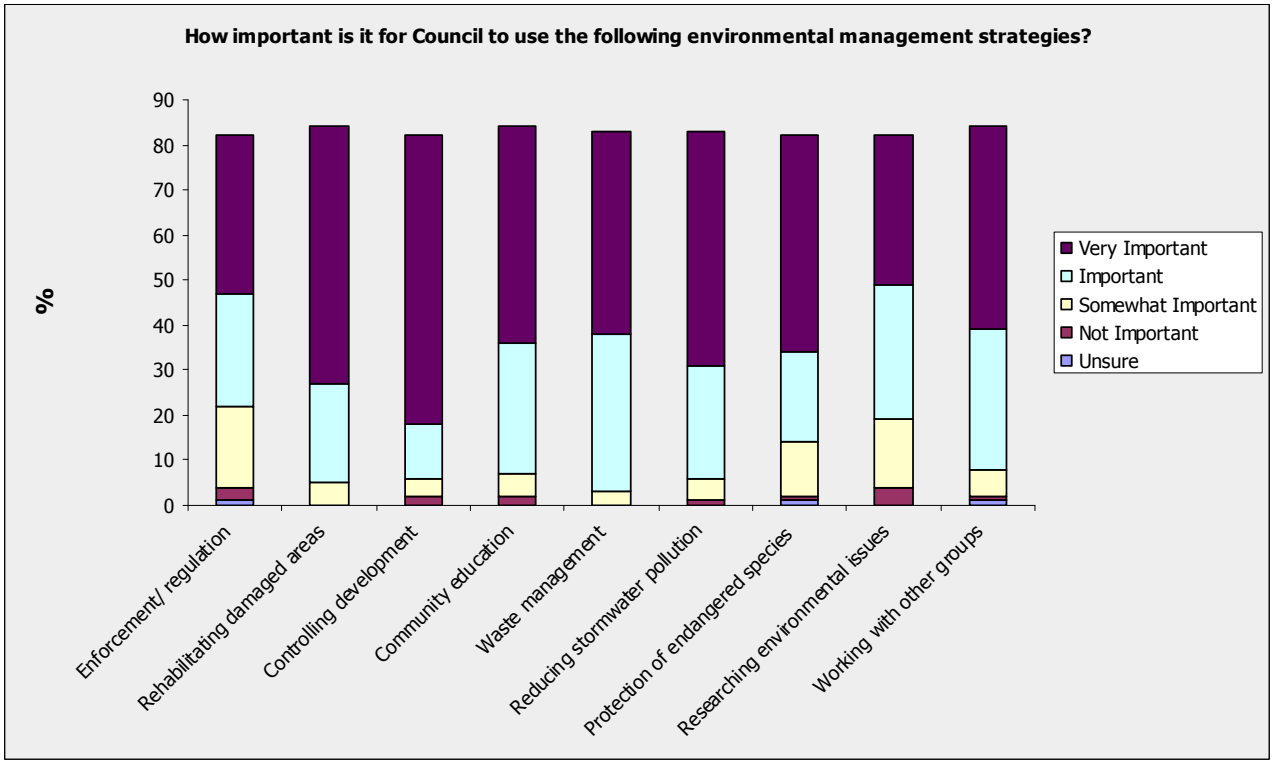


Figure 66

The graph above (Figure 66) shows the most popular action to be considered Very Important was controlling development (78%), rehabilitating damaged areas (68%).

All actions listed were considered to be either Very Important or Important by more than 40% of all respondents.

Question 9: *Which of the following environmental practices did you undertake last year -please tick all applicable*

Results shown by graph below.

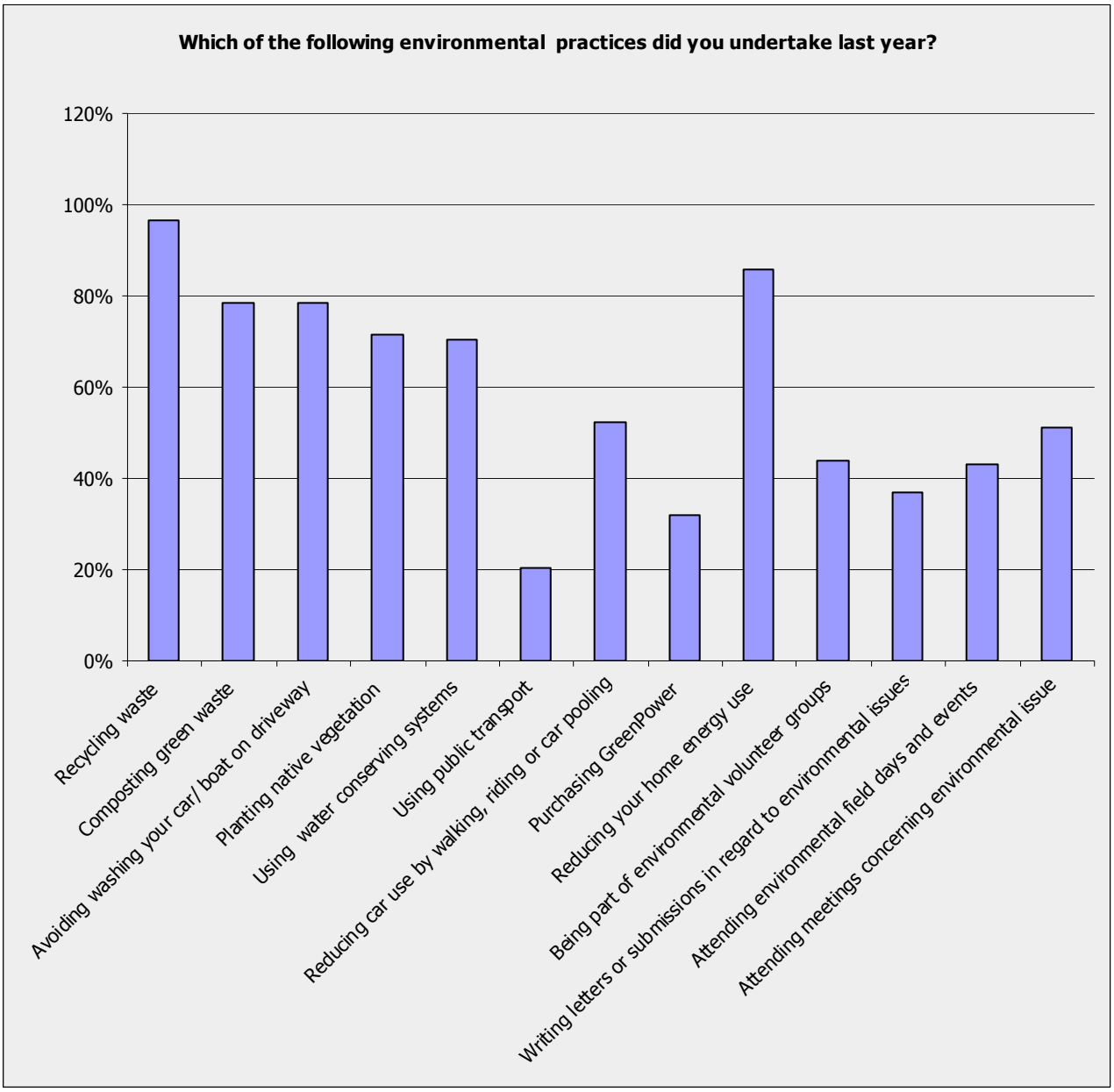


Figure 67

Recycling, composting and reducing home energy use were the most commonly selected activities.

Question 10: *What does the term 'sustainability' mean to you? (Respondents were asked to choose from a number of options)*

There were no right or wrong answers for this question, respondents simply chose a definition of sustainability that meant most to them. Some people chose more than one definition. The graph below (Figure 68) shows the most popular responses.

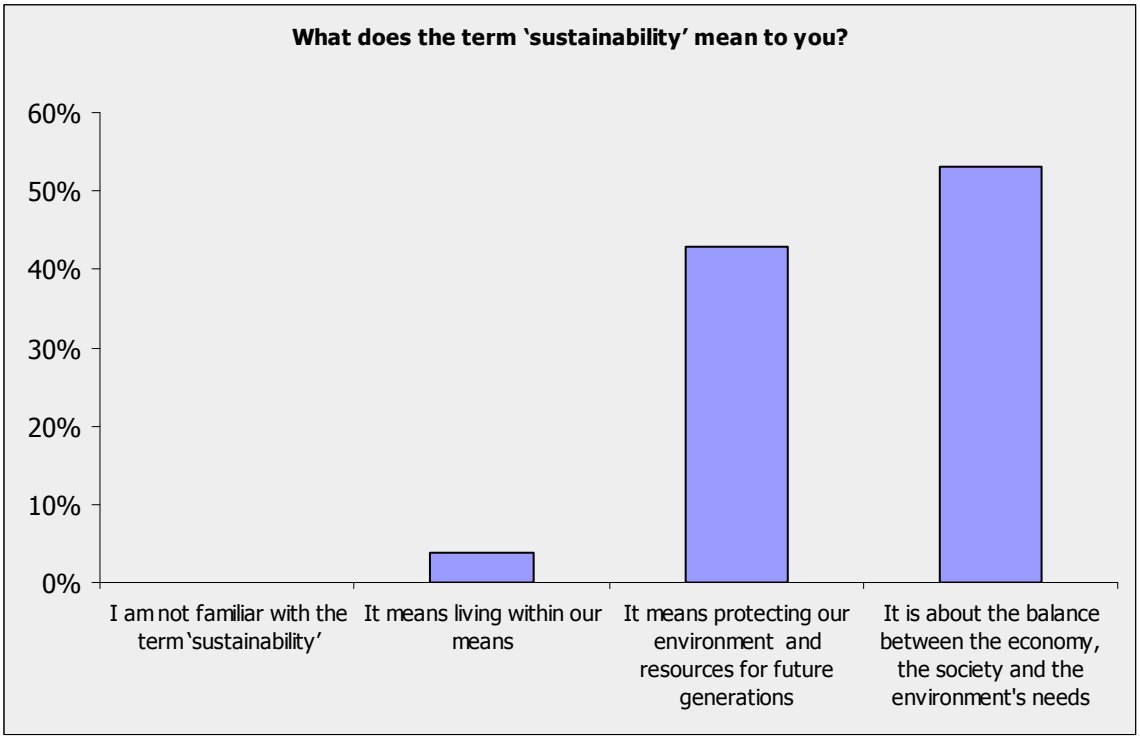


Figure 68

Question 11: *What is your vision for a sustainable Great Lakes environment? What would it look like? How would it be different to today?*

This question allowed respondents to formulate their own answers, these are listed below.

1	opening up to ideas of more residential development in smaller towns, ie Bulahdelah, North Arm Cove etc.
2	To stay how it is and to stop allowing development in areas where native veg is destroyed. A cycleway that allows you to go from one end of the LGA and more preferably a system that interlinks all major centres in NSW
3	improving conditions and services for humans and wildlife
4	More bushland reserves held as carbon sequestered areas
5	I would love to see all houses to be able to have energy saving devices incorporated into them. This should be forced for all new homes, and more Ruddy style handouts for older homes to be retro fitted. As well as an increase in bike paths around the area to allow the safe passage and encourage people to commute in this fashion.
6	a place where my children and grandchildren can enjoy the land and all it offers and not a concrete jungle devoid of the biodiversity of life
7	A localised, co-operative economy that puts community needs including healthy natural systems first. Localised, decentralised provision of human needs that supports the ecological processes which support this provision. This would be facilitated by co-ops for supply of human needs including food, shelter and clothing, and by a conscious effort to move toward regional self sufficiency for these human needs including materials and tools. Efforts to decrease dependence on crude oil and other fossil fuels could include advanced municipal composting and energy capture systems (human waste and other organic wastes), localised electricity generation using wind, tidal, wave and solar power, pedal powered transport in urban centres, wind/oar powered transport on waterways, efficient public transport joining urban and village centres.
8	I envision a natural landscape, visually uncontaminated by incongruous exotics (Norfolk Island Pines in particular) and gaudy hybrids that don't belong here, and that deter small endangered birds. I envision a built environment featuring the best and most beautiful of the numerous beautiful species indigenous to the Great Lakes region. Species we should cherish and seize every opportunity to cultivate in our gardens, as appropriate, and in the design of public parks and reserves. The Great Lakes region will then look very different from today. More like yesterday, before we

	haphazardly replanted with whatever exotic plants took our fancy that would grow here. It would look unmistakably The Great Lakes region, its dominating exotics, invasive intruders (such as Radiata and other exotic pines) and its haphazard, 'dogs breakfast' landscape gone forever, its 'sense of place', 'sense of unity' and regional identity restored. In the years ahead, this will be a certain drawcard for members of the GL community and visitors alike, weary of the visual confusion and loss of identity in towns and settlements across this land.
9	A Council that accessible and not council and its staff being unresponsive to residents
10	Significant improvements in: - Soil conservation - Water protection - Native vegetation protection - Sustainable energy generation - Energy efficient housing
11	encourage better designed homes rather than the blight of "brick venereal" that are not attractive nor built energy efficient. How many of these new homes have an "after build" energy inefficient (read cheap Chinese) air conditioner installed in the twelve months immediately after completion? maybe council should require a DA for all after build aircon installations on new homes from a set date.
12	Controlled development. Healthy ecosystems and waterways.
13	No more clearing of native vegetation, re-establishment of viable wildlife corridors between isolated remnants of our original vegetation, management of domestic animals to preserve our precious wildlife, removal of bitou, asparagus fern and other weeds that threaten the total destruction of our coastal headland and dune ecosystems, a system of coastal walking tracks from Forster to Hawks Nest to allow people to see what an incredible part of the world we have been entrusted with, no 4WDs on beaches, particularly those less than 2km long and those in national parks
14	Most cars in Forster have only one passenger. People would perhaps chose to make errands on foot or pushbike if given a chance. Cars still get the best view in town with car parks right at the pristine water front! Visitors from overseas can only shake their heads at so much lack of imagination and creativeness. The car still dominates the town like a dictator, time has come to start working on a town made for people of all ages to enjoy. Little street should be turned into a walking and cycling promenade. If they can do this in a huge city like Hamburg and New York, why not here? When the first pedestrian shopping areas were created 20 years ago (!) in Europe, the shop keepers and locals were crying out that they'd all loose business. But the visionary decision makers pushed it through and soon everybody was pleased and no shop lost money. On the contrary, people enjoy safely strolling through those pedestrian areas and shop more than before. Thinking outside the square is necessary, being brave and at times making decisions which are not backed by the entire community. It's like with children, sometimes they have to be forced to eat vegies for their own good!
15	We should be moving more towards a low water and energy usage community. Medium density developments in existing urban areas should be encouraged rather than expanding single dwelling housing into wetland and coastal bushland areas. Approval for high rise developments should be dependent upon implementation of sustainable technologies in their design. Existing industries should have encouragement programs /regulation to use sustainable technologies including our main industries fishing aquaculture and tourism. Great Lakes should be promoting itself more as a clean environmental destination showcasing best practice sustainability and reduction in carbon emissions. Recognising that sea level rise will have massive effects on our low lying areas.
16	No development on low lying coastal areas. No development on foreshore or flood plains. Self sufficient community that does not rely on the use of unsustainable environmentally degrading fossil fuels to survive. Less packaging, more bartering. Less waste accumulation, followed by well planned recycling and reuse programs.
17	More emphasis on the village nature of such areas as Smiths Lake, Blueys Beach, Boomerang Beach, etc. .... there is presently an imbalance between holiday properties versus residential. More emphasis on passive aquatic activities such as swimming, kayaking, sailing, recreational fishing in small quiet waterways such as Smiths Lake. This would be much healthier for the lake. A shuttle bus service (small quiet vehicles) from centres such as Forster to outlying areas would reduce car pollution.

	Elimination of 4-wheel drive vehicles on beaches presently dangerous, beaches are scarred with deep wheel tracks, and contribute to beach erosion.
	better house design so as to use less power more solar power more wind power action not talk E.g. build the walk around Smiths Lake better public transport e.g. Smiths Lake to wherever
18	Community gardens
19	There would be fewer high-rises which concentrate populations, increase waste through poor recycling and green waste disposal and increase pressure on resources. More inner urban space would be designated as parks for families and the community to enjoy.
20	To maintain the natural environment by concentrating development in existing urban areas; rehabilitating degraded habitats and providing opportunities for alternative business/farming/cultural etc activities.
21	I would like to see a council area that has a good balance between development and protection of a diverse range of environmental habitats. I would love to see 4wds removed from all beaches - I love the walk along Sandbar beach but HATE to see the environmental damage done by the 4wd activity on the grassy dunes. The destabilisation of the dune area will only create a problem when we have future big sea events. I love the work council has done towards the Bitou bush control along the coast and only hope this can continue as more follow up work is needed. I love the helpful council staff - our induction by council environmental staff was great and my husband and I often go walking with a pair of secateurs and a bottle of glycophosphate and do our bit for weed removal in the more remote areas. I would like to see council be more proactive in the establishment of REAL wildlife corridors not just notional ones that are in reality, inadequate. I would like to see more control over clearing bushland for development - I would love to have a walking track/route from Forster to Cape Hawke - this would be a real drawcard
22	Get people to use it and become interested in it, then they will care about it.
	All new development to be low rise and environmentally friendly i.e. using renewable energy and materials to construct and maintain them. There would be a lot more people on pushbikes using bike paths all the way from Pacific Palms to Tuncurry. THERE WOULD BE NO more BIG SHOPPING MALLS like Stocklands. THERE WOULD BE a regular and efficient public bus service from Bungwahl to Forster. There would be cool street advertising selling recycling, renewable power, growing your own food, and enjoying low impact recreational activities (not high speed jet powered boat rides up and down the coast). There would be a lot of smiling and healthy faces of all ages. There would be many more govt grants and incentives to retro fit homes to upgrade to "greener" living. The tourist influx in summer would be managed in such a way that their waste and impact on the environment was lessened and they were charged an environmental holiday levy! Children at school would be as keen about environmental programs as sport and taught accordingly. DEVEOPMENT WOULD BE LIMITED in size ,scope and place so that plants and animals could travel throughout the region to maintain their health and numbers. The water in the ocean and lakes would be crystal clear, free of pollutants and there would be no rubbish on the high tide line.
23	Sounds achievable to me!
24	Healthy waterways, bushland and fishing stocks. Sustainable urban, rural and agricultural

	development for current and future generations.
	Enhanced regeneration of native vegetation throughout the urban areas. An effective public transport system that encourages its use and thus reduce the number of vehicles on the road. i.e. reduce maintenance and emissions. I once lived in SunValley Idaho that provided a free bus service that looped around the urban areas. Eco style development; buildings not to exceed the tree line; i would like to see it made compulsory for air conditioner installation to coincide with solar power. i.e. buy an air conditioner buy the equivalent in solar power. Air-conditioning is a luxury Looking towards the future with sewerage waste treatment, installation of a urine separation system. This can reduce many of the issues involving treatment of nutrients and provide an opportunity to treat and recycle these nutrients as a fertilizer. i.e. the majority of nitrogen and phosphorus is
25	passed in urine.
	Larger focus on slow food/local produce and better education on caring about the future of the
26	environment.
	Extension of good quality environments, protection of these, rural settlement based on environmental constraints, higher density urban to protect rural areas, pristine water, good river and
27	wetland habitats for fish and birds in the face of climate change.
28	Places where future generations can walk, fish, ride as I did when I was young.
	- both sides of all bridges on dirt roads could be sealed - privet and lantana cleared from creek and river edges
29	- picnic areas maintained/set up in suitable places
	Preserve environmentally valuable and fragile areas from development and degradation especially in the coastal zone. Encourage access to environmentally valuable and scenic areas while preserving their values. Development to be concentrated away from coast (say 15 mins) while still reasonably
30	accessible to coastal areas.
	1. A very carefully planned, monitored and supervised (by qualified personnel) development programme 2. Maintain our seaside village environment 3. Slightly increase population, a few more 'services' but still maintaining a sea side village
31	atmosphere.
	I realise that it is inevitable that G.L population will rise particularly coastal towns. I would sincerely hope that the council remains vigilant re: inappropriate over development, housing density, need for retention of sufficient native vegetation/wildlife corridors. This areas natural beauty/ resources are
32	highly prized.
	1. No high rise buildings in coastal townships 2. Protection of our waterways from siltation and nutrient runoff
33	3. More bushland reserves and passive recreation parks
	Maintain a sustainable level of development with appropriate service. Stop over fishing and control
34	waste water
	- promote rural village atmosphere for LGA - review and develop strategies that take into account climate change - development to be away from coastal strip - preserve this natural resource - preserve healthy hinterland environment with protected zones in the catchment - promote sustainable farming in the catchment to improve quality of whole LGA
35	- more public transport in the LGA and linking to other LGA's
	1. University appointed environmental scientific panel to champion the natural environment over the 'Natural' greed/short-sightedness/ignorance of vested interests who use 'Sustainability' as a veil to hide ongoing cancerous degradation of our natural environment. Holistic, more environmentally sensitive 'precautionary principle' based.
36	Long term environmentally protective rather than short term exploitive/expedient.
	- Clean and healthy river (Myall) - Healthy fish and wildlife population
37	- Erosion and siltation in Port Stephens under control and monitored.
	- treat environment and waterways free of rubbish (garbage) - free of invasive weeds and feral animals
38	- preservation of local flora

	- wind farms - no littering or polluting - green waste composted and sold back to ratepayers - roof runoff/tank overflow through absorption beds not feed out to street - replacement of trees felled in building/development with TREES
39	- small clusters of housing not blanket coverage with token wildlife corridors and stagnating ponds
40	Leave a few areas free of building. Make even small areas friendly to the environment and fauna. Our wildlife contributes to our enjoyment of life.
41	Pristine lake and beach environment with moderate development. High rise buildings controlled and kept to specified areas.
42	Why not be a 'go ahead' Council? (Don't say lack of funding!) I think that sometimes groups or studies are set up that 'duplicate' each other, and Council choose which results suit them to implement - OR - just ignore, unless a critical issue (like the 'Oyster scare') forces them to do so.
43	When I first visited this area in 1950 it was in a primitive but natural state. Development is important but it needs to be controlled. Tourism also is not the be all and end all as it emanates from development and improvements and it becomes our master. Turn back the clock is my dream.
44	- Stipulate maximum population - stop urban sprawl - reduce commercial fishing
45	A sustainable Great Lakes environment has stable ecological zones in which there is an energy balance supporting living species where populations are stable. Zero population growth.
46	I believe that our current environment is sustainable. We should continue with the planting of native trees and shrubs and the eradication of feral plants. The quality of the water in our rivers and lake systems is vital to our well being. Protection from soil and sand erosion is necessary.
47	Making everyone aware that their everyday existence results from an economic, social and environmental need that at times can never truly be balanced.
48	The Great Lakes system i.e. especially Wallis Lake plus the islands left undeveloped. Also the Nine Mile Beach hinterland left as pristine as possible
49	Greater master plans for controlling traffic through the built/commercial areas. Great use of memorial drive precinct for family recreation and outdoor cafes (no cars). Greater use of marinas and restaurants along Little street.
50	Controlled development - preservation and improvement of Wallis Lake as the major asset of the area, reduced influence of ultra green pressure groups.
51	A more caring community caring for their own properties and public areas and roads. Planting natives rather than exotics, getting rid of green waste by mulching or tip disposal, avoiding dumping of rubbish
52	Suitable and supported developments. Smiths Lake Village development should be monitored and the village atmosphere and native vegetation should be considered.
53	Clear guidelines for future urban development within communities taking care to protect the environment at the same time. No further encroachment into wetlands. Keeping communities informed with regards to developments which affect their communities.
54	There would be a sustainable balance between development and the environment AND a sustainable balance between the environment and especially primary industry.
55	A balanced approach to both urban and rural development, protecting our farmland and keeping pollution to a minimum.
56	Environment (beach) cannot be changed. Tides decide the environment. 4wd accessibility and animal use could be monitored. Dogs running loose on beach at all times.
57	My vision for a sustainable Great Lakes is a less developed town. I think the main impacts on the natural environment of the Great Lakes are over population/development and introduced species. A sustainable Great Lakes would not have these issues.
58	Unclog the Myall Lakes, Leggs Camp ran by local Council. Implement Green Power systems, wind generation, solar etc and including recycling/separating waste.
59	Pristine lake/beaches surrounded by public green space
60	To continue developing along current lines. Reduce the red tape and make decisions earlier and act on them within quicker timeframe.
61	A lot more development of the tourist trade. Forster lacks an identity i.e. it needs to promote the area, beaches, lakes, oysters, fishing. We have a good range of accommodation from Caravan parks, motels, quality apartments. We need to get better use of these.
62	To think of the environment instead of dollars and cents

63	That everyone pull together to reach a common goal to make our beautiful towns to prosper and kept clean in all aspects.
64	Shared responsibility for a sustainable Great Lakes environment. We are hopefully all working toward this in a personal and local level. Educating tourists as important as well as educating kids starting at primary level. The difference would hopefully be a more aware way of life and making everyone responsible.
65	Future housing development would ensure that a coastal village atmosphere was maintained by regulating lot sizes, restricting removal of mature trees.
66	The Great Lakes should be more user friendly for pedestrians and cyclists. Cycleways should be integrated together, not stop and start over and over. No more highrise please! Future planning should incorporate access for more than motor vehicles.

***Question 12**: What actions do you think are most important for achieving the vision you have described above? (in Q 11)*

1	Decisions need to be made in regards to land usage, instead of giving people false hopes have the land declared national parks or the like instead of "maybe, maybe"
2	Rezoning significant areas to environmental protection. Every time a road is upgraded resealed etc, a cycle way is included.
3	Carbon trading scheme enacted
4	A change in policy for new developments. An increase in bike paths. But don't want the bike paths to trash large amounts of lake / ocean foreshore.
5	Education
6	Participatory (empowering, not coercive) education on the way in which ecological processes can be harnessed to supply human needs. Support for a community exchange economy (local, cashless, interest free currency as a means to allow community abilities to be equitably matched with community needs). Support for co-op structures, community supported agriculture, community gardening, urban agriculture, local manufacturing. Zero waste policy, bans on ecologically odious products like non-reusable packaging. Ecological tariffs on produce imported to the region- based on distance transported, embodied energy, labour and environmental standards of region of departure.
7	* Setting a good example * Public discussion, (internet) campaigns, workshops, seminars, field days * Newsletters * Legislation
8	Councillors being accessible and maybe a" ward" system of election
9	Hands on interaction between individuals and natural environment with guidance
10	Council should look at villages like Noosa, Byron Bay, and others where there is no or limited high rise and in the main much better designed homes. Maybe council should require a DA for all after build aircon installations on new homes from a set date.
11	Strict development conditions. Lots of rehabilitation and protection works.
12	1. Planning recognition that we should only develop land that has already been cleared 2. A real priority being given to maintaining and building wildlife and climate change corridors 3. Much stronger controls of domestic animals in urban areas near the bushland interface 4. A huge coordinated effort to remove weeds from our most threatened areas before we lose the values of those areas, perhaps forever 5. An appreciation that people will not value what they cannot see - hence an interconnected series of coastal walking tracks the whole way from Forster to Hawks Nest 6. Removal of 4WDs from our shorter beaches and those in/adjacent to national parks
13	Council needs to be given greater legislative power. It cannot be that council, who is working towards creating a better place to live in for all residents, has to live in fear of wealthy land holders who can sue council on their decisions. This place is too much a developer's heaven, where the biggest gun is always right. Gun meaning money here. Precise zoning, clear definitions that leave no grey zones or loop wholes for those who have the money and consequently lawyers to fight their way through to the development they wish to pursue.

	Further, many regulations are printed on glossy paper but no one follows up on these things. Impact studies are presented, at times even by neighbour land holders who definitely have a vested interest in the outcome of the study and consequently, the entire enterprise is a waste of council funds and leads only to window dressing. Duty done, regulations are observed, but no or little results are achieved or even negative ones. Bear in mind human nature. At the end of the day, people who work for the council work for the community and it should not be that they all too often have to bear the brunt of disgruntled individuals, who see only their side of the coin. Council must be equipped with the right tools to do their job properly and that includes adequate legislation.
	I would like to see Great Lakes continue the good work in the catchments reducing sediment loads and nutrient exports to the lake. The health of or waterways is key to life in Great Lakes. I think there should be careful consideration of any further development on the low lying wetland areas e.g. to south of Forster. Council should formulate/debate/ and implement a policy of coastal retreat in event of sea level rise or coastal erosion. The ludicrous and costly situation at Jimmys Beach should never be repeated. Wallis Lake should have been included in the Marine Park, but as it wasn't there should be a proposal developed for aquatic reserves of no fishing areas within the lake e.g. Wallingat river to ensure future stocks are sustained. Black market amateur fishing should be cracked down upon. Alternative industries for fishing community should be encouraged. Unsustainable activities should not be subsidised. e.g. Water skiing should be properly regulated in the Wallamba river. It is an unsustainable activity where environmental costs are too high and are not adequately borne by the participants. New developments should aim to be carbon neutral. There should be greater council assistance or
14	control to encourage use of low emission and sustainable energy technologies.
15	Ban development on coastal low lying areas, floodplains, foreshores. Get back to basics. Harden up!
	Ban 4WDs from beaches. Turn Smiths Lake into a 4 knot maximum zone. More attention to planning approvals.
16	Subsidise a small vehicle bus service.
17	Starts with the individual of course.... However councils need to think "PEOPLE BEFORE PROFITS"
	Zoning! I don't believe that Forster in particular has great facilities for children and youth to use.
18	This increases pressure on the surrounding reserves and national parks.
19	Maintaining and expanding existing environmental programs; integrated long-term planning
	Adequate environmental mapping of the Council area. Continued funding for the removal of Bitou bush and increased planting in these areas where needed Much stricter controls of vehicles on beaches - especially after high seas remove much of beach- these are the times we should show some control and maturity and close the beaches until they recover. Not just let cars drive over the dunes. Further environmental education - especially in school holidays. Weed removal and education can be fun !! Adequate assessment of wildlife corridors and a plan for their protection and expansion
20	(environmental covenants should be encouraged with land holders)
21	Open/dredge the lake, make it navigable. So fish can easily migrate through the estuaries. Poor water flow is allowing algal blooms to occur.
22	Council planning and research by environmental experts to put in place strict guidelines for human activities and development. Educate the community in a fun and cool way - children are the best hope.
23	Enforcement of environmental regulations and policies. Education and building capacity of community to understand and take positive actions to reduce impact on the environment.

24	Council taking the initiative, leading by example.
25	Scare tactic advertising. More frequent food markets.
	- reviewing plans - research and best practice - experienced officers to help community to properly deal with issues - excellent integration of environmental management into planning and engineering
26	- seal roads
27	Less population, look after and improve parks and recreation areas we already have.
	- employ road workers who know a little about roads, as opposed to nothing - encourage the formation of volunteer groups in local communities to clear vegetation etc
28	- promote and publicise active groups
29	proper control of rezoning
30	Strictly adhering to point 1 above
	Recognition that pure greed can govern D/A's and there will be increasing demands on our environment - so the absolute necessity for Council to continue to listen to concerns of residents and not allow overdevelopment.
31	Education and raising of awareness of fragility of this environment.
	1. Careful planning of foreshore development
32	2. Implement adequate stormwater controls in both village and rural areas
33	Local government to have overall control in conjunction with local community,
	- work more closely with adjoining councils - improve country road infrastructure - improve transport i.e. public transport - return system on local community reps to council eg. village reps
34	- work more closely with environmental groups
	- holistic natural environment/ecosystem 'landscape' policies/strategies/implementation plans - broader non-political/non-vested interest approach to protecting our unique natural environments/ecosystems - greater education on the need to protect the natural environment and ecosystems - placing a truly reflective 'economic' present/future 'value' on maintaining/protecting our natural
35	environment/ecosystems
	Adequate research and follow up data monitoring.
36	Further improvement to river banks and foreshores
	- consultation ++ - public education, cooperation and initiatives (e.g. war against weeds)
37	- establish a local botanic garden
	- Council initiatives - appropriate solutions e.g. instead of dredging a beach and dune area, dredge a silted up river and place car tyre structures underwater off Winda Woppa to break the SE Seas - concept planning e.g. Nth Shearwater EIS etc
38	- Encouraging tourists to live/visit respecting our standards
39	Continued sustainable development very closely monitored in and along lake and beach. No high rise for one mile beach area.
40	Keep development and population within controllable limits or else you have the tiger by the tail and cannot let go. Too many statements are made in support of tourism and not enough emphasis is made for the need for sustainability. This is typical of the Australian Eastern Seaboard.
	1. Sustainability depends upon stopping the growth imperative 2. A balanced environment within the limits of available and reproducible resources to sustain ALL life of plants and animals 3. Sustainability depends upon population limits within renewable resources and energy from sun.
41	No to Council increasing TOURISTS and population.
42	As human and vehicular traffic increases it becomes necessary to stabilise river banks and beaches. Boat speeds should be restricted in all enclosed areas. No vehicles should be allowed on beaches. Dredging to increase water depth is necessary in some areas. Provide better surfaces for push bikes to increase their use - decrease cars.
43	Educating the 'NIMBY' idealists that they have a moral responsibility to accept/adapt to changing circumstances/environments in order for them to continue to enjoy everyday vices
44	No further extensions of oyster farming activities. No linking of adjacent islands to any part of the foreshore. No commercial/residential development of Tuncurry/Nine Mile beach hinterland

45	Council needs to be more proactive in the development and planning of the built environment. e.g. Main Street programs for Wharf Street and Little Street and Memorial drive
46	Allow a steady growth of the area while mindful of the need for adequate infrastructure capacity. Devote sufficient funds and labour to manage the tourist and residents requirements of Wallis Lake. Recognising that first and foremost, the Great Lakes area is a place where people live in harmony with the environment.
47	Council and volunteers group maintenance and improvement of bushland. Minimising rubbish dumping and adequate punishment for offenders. Street policing of vandalism. Avoiding overcrowding such as the proposed new development in Green Point. Improving drainage where it is inadequate.
48	Regulations adhered to regarding development. Regulations re-visited and if necessary these regulations should be changed to prevent destruction of native fauna/flora.
49	Encourage and promote community groups. Staff who can interact well with the community and who have good general knowledge/common sense/education.
50	A management plan to sustain these balances to give development and industry a future BUT at the same time protecting the environment.
51	Council must enforce all laws in regard to development pressures and not allow urban sprawl to develop.
52	More restrictions on development. More action on introduced species.
53	Remove National Parks from control of the Myall Lakes and find ways to separate waste and find a use for it.
54	Council and State Gov must put aside land near lake/beach for public space. Tourists mostly come here for the natural beauty and lack of development - lets keep it that way.
55	Solid, well researched information, then 'proceed'.
56	1. Build the planned civic precinct - very important! 2. Further improve the entrance to Tuncurry 3. Attractive signage on Pacific Highway (people complain about almost missing the turn off) 4. Develop better and more restaurants 5. Develop Wharf St as a boutique shopping area
57	Reducing further development of our wetlands in coastal towns
58	That Council should have more vigilant observations of people spoiling our town with graffiti, rubbish, clean gutters and drains.
59	education/enforcement/control/awareness/networking/managing.
60	Careful consideration should be given to all residential development in the future so that developers can not destroy native bushland unnecessarily for the sole purpose of maximising the number of small building lots.
61	Promotion and education of better lifestyle choices to keeping fit and healthy. Restriction of further high density housing. Funds allocated to pedestrian/cycle ways.
62	Placement of garbage bins in pedestrian areas. Better stormwater disposal and filtering

***Question 13**: Who do you think is most responsible for making the Great Lakes a sustainable place to live?*

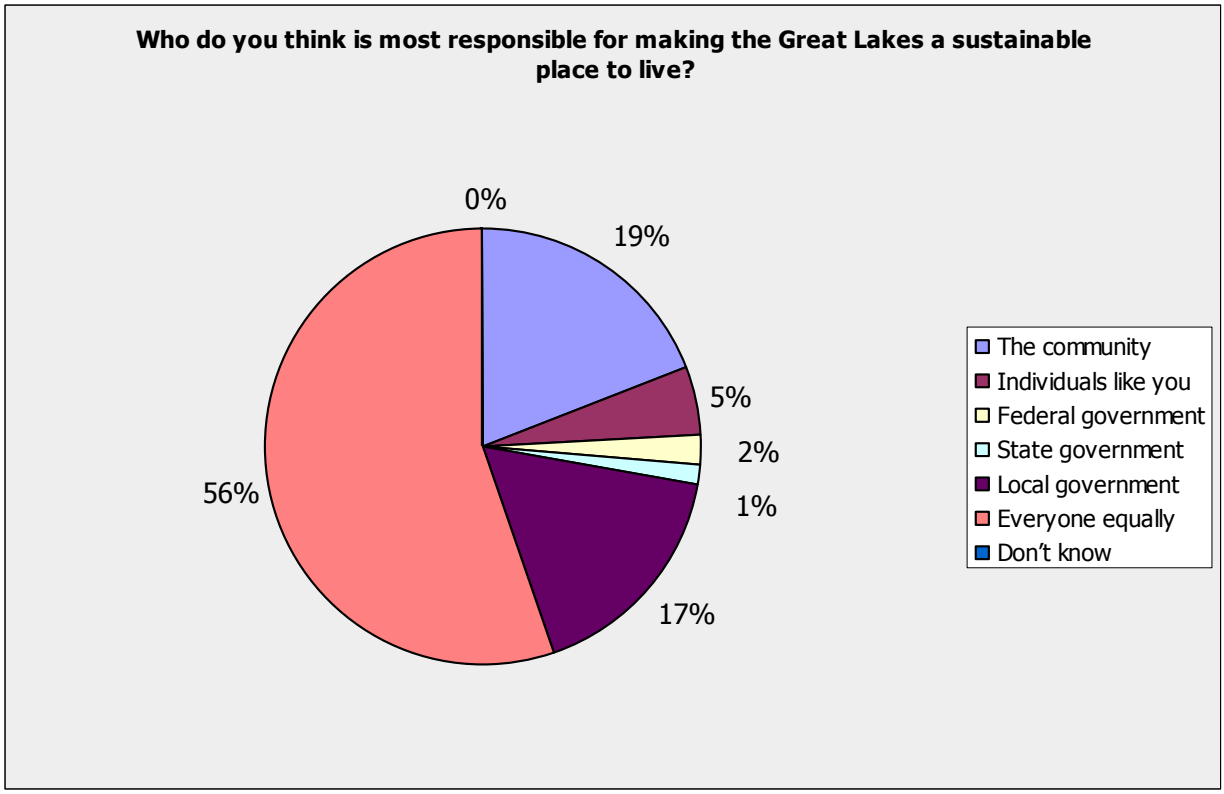


Figure 69

The graph above (Figure 69) shows that the most popular answers to this question were 'Everyone equally' and 'The community'. 'Local Government' was the next most popular group to be considered the most responsible for making the Great Lakes sustainable. Please note many respondents chose more than one answer for this question.

Trend Analysis

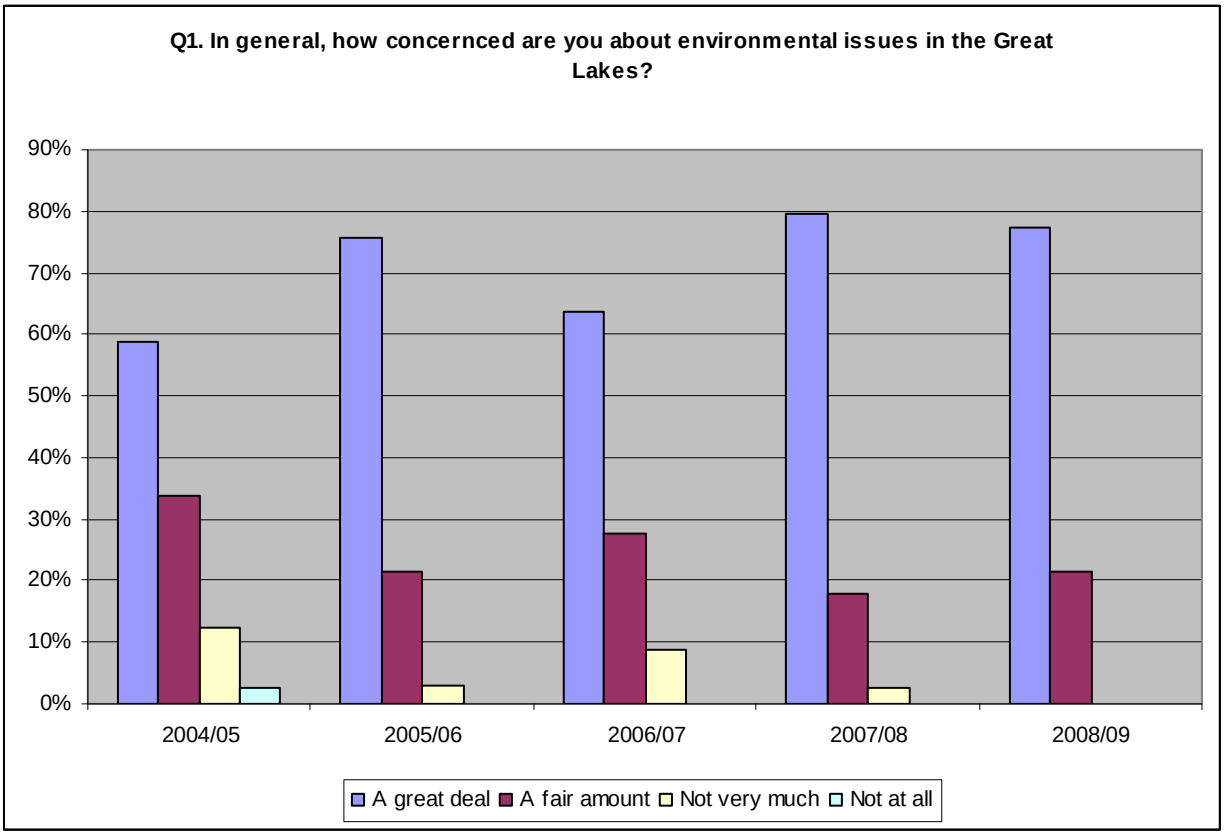


Figure 70

Majority of residents care either ‘a great deal’ or ‘a fair amount’ about the local environment, and is consistent across all five years of data collection (Figure 70)

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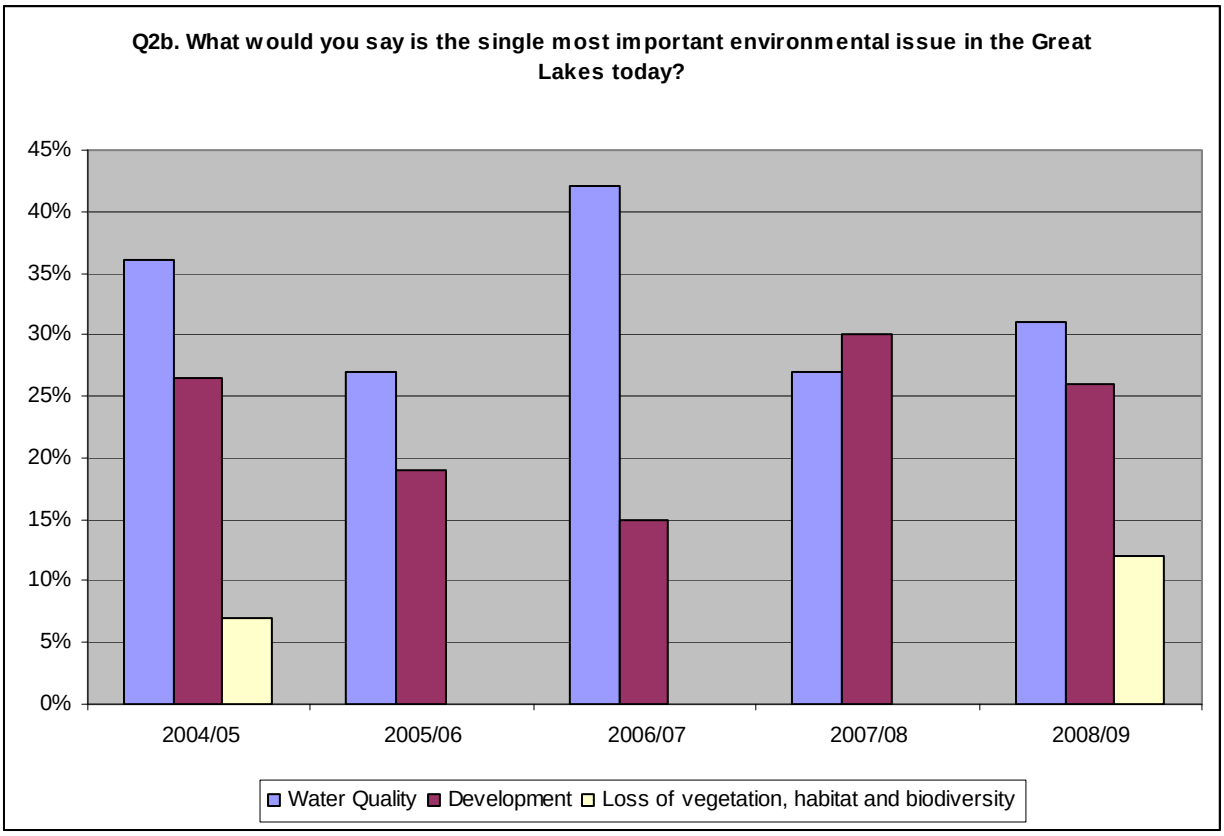

Figure 71

Both water quality and development are rated high as important environmental issues (Figure 71). However, water quality was rated highly in the first part of the reporting period and there has been a shift to development pressures in the latter part of the reporting period.

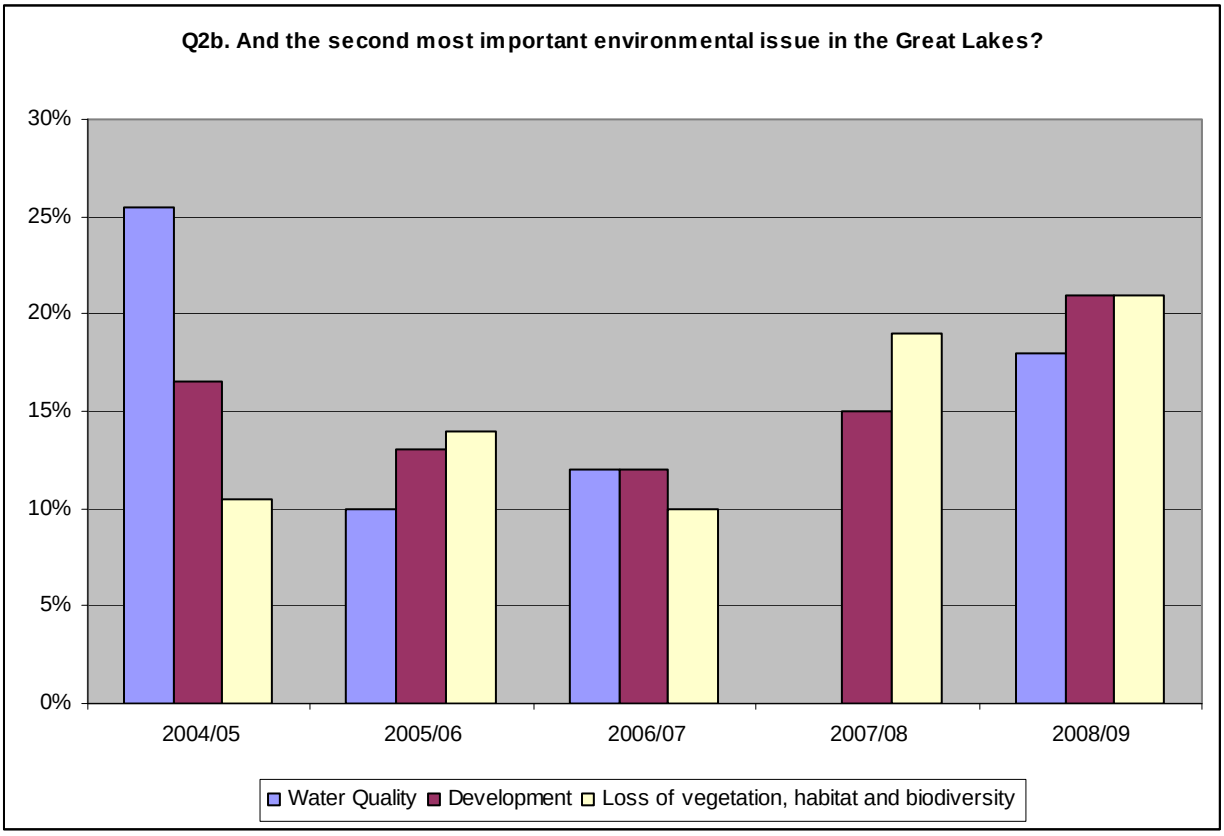

Figure 72

Loss of vegetation, habitat and biodiversity was rated highly for the second most important environmental issue and increases over the five year period, along with development pressures (Figure 72).

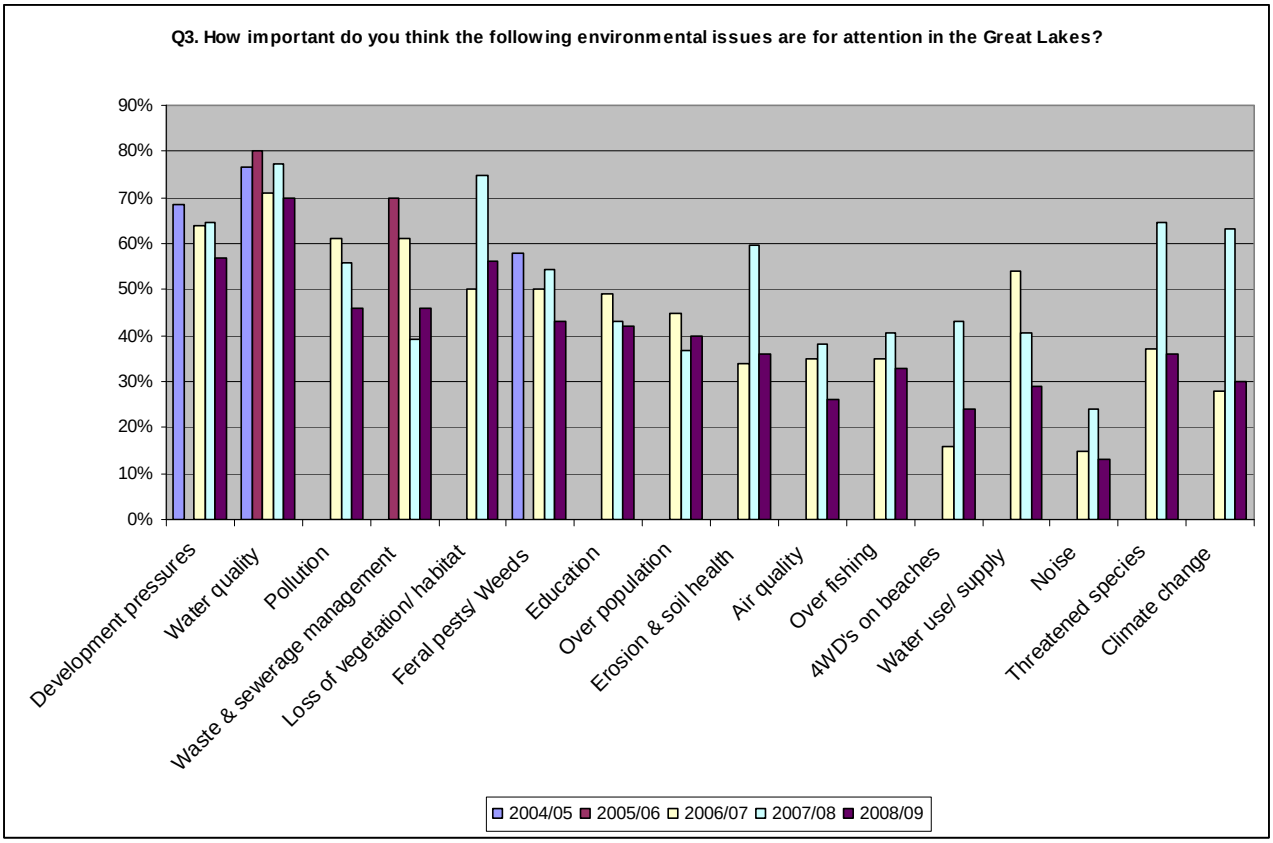

Figure 73

There is limited data for the 2004/05 and 2005/06 reporting period and as such, limited trend analysis can be performed on this data. However it can be seen on the above chart (Figure 73) that development pressures, water quality and loss of vegetation and habitat are the three main pressures that are and have been a concern to the local community over the five year reporting period.

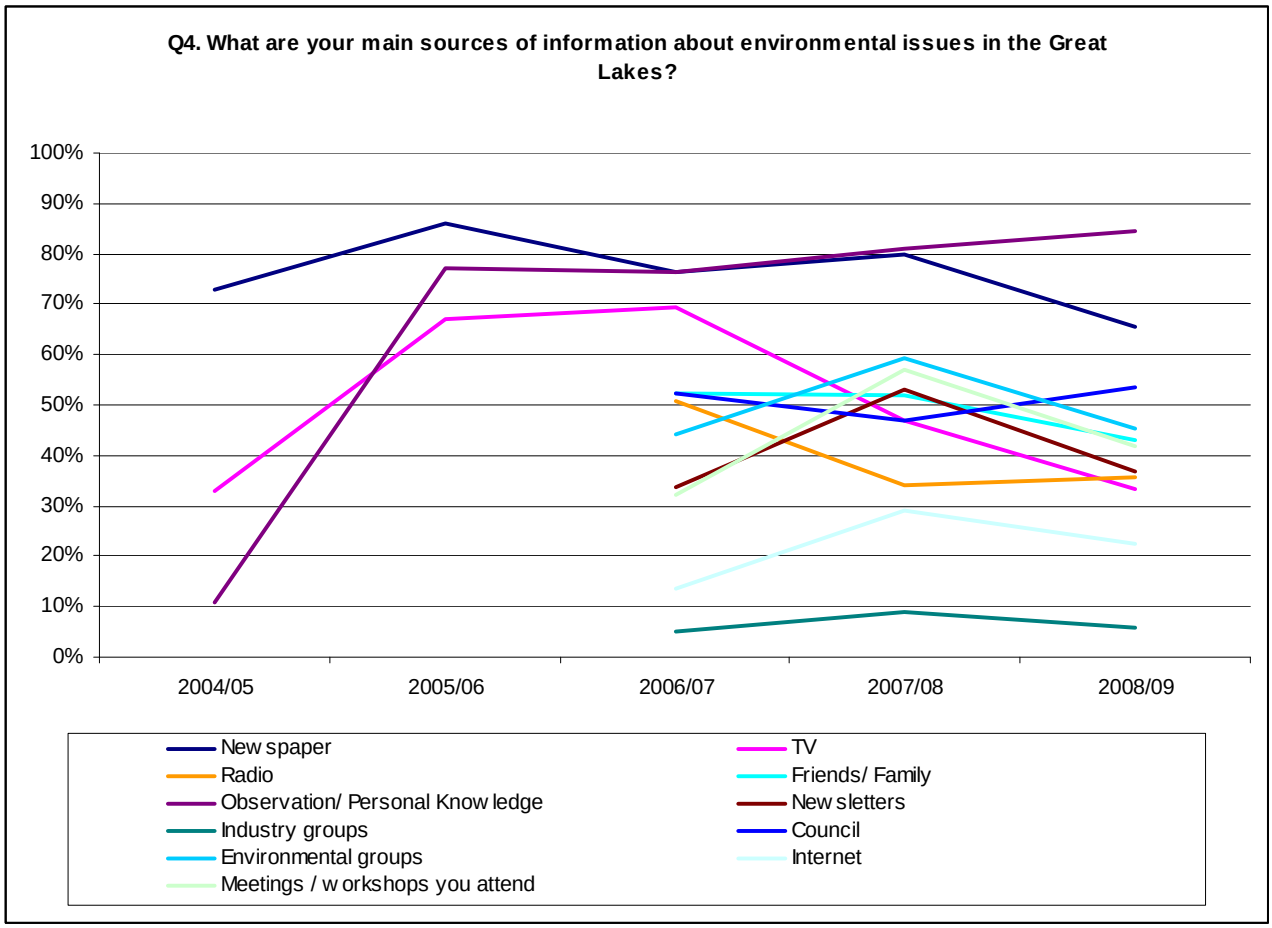

Figure 74

Again there is limited data for the five year period, but it can be seen in Figure 74 that there has been a slight shift in the way that the community sources its information on environmental issues. There has been a move away from newspaper and television as a source and the community is relying on information gained through personal knowledge or observation, and information distributed by Council.

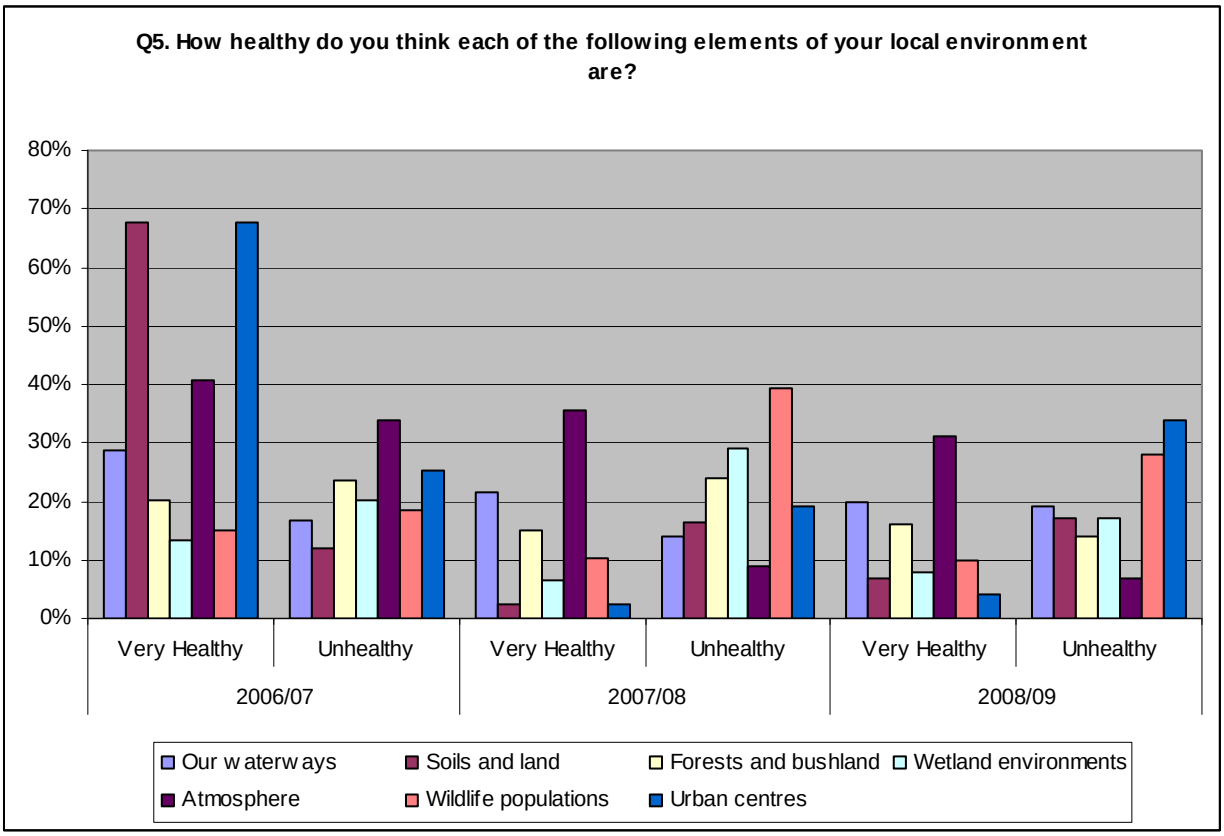

Figure 75

There is also only three years worth of data for this question which means limited analysis, but the last three years of data is available, and some basic conclusions will be drawn from this. The chart shows (Figure 75) that there has been a decline in the community's perception of what is 'Very Healthy' since 2006/07.

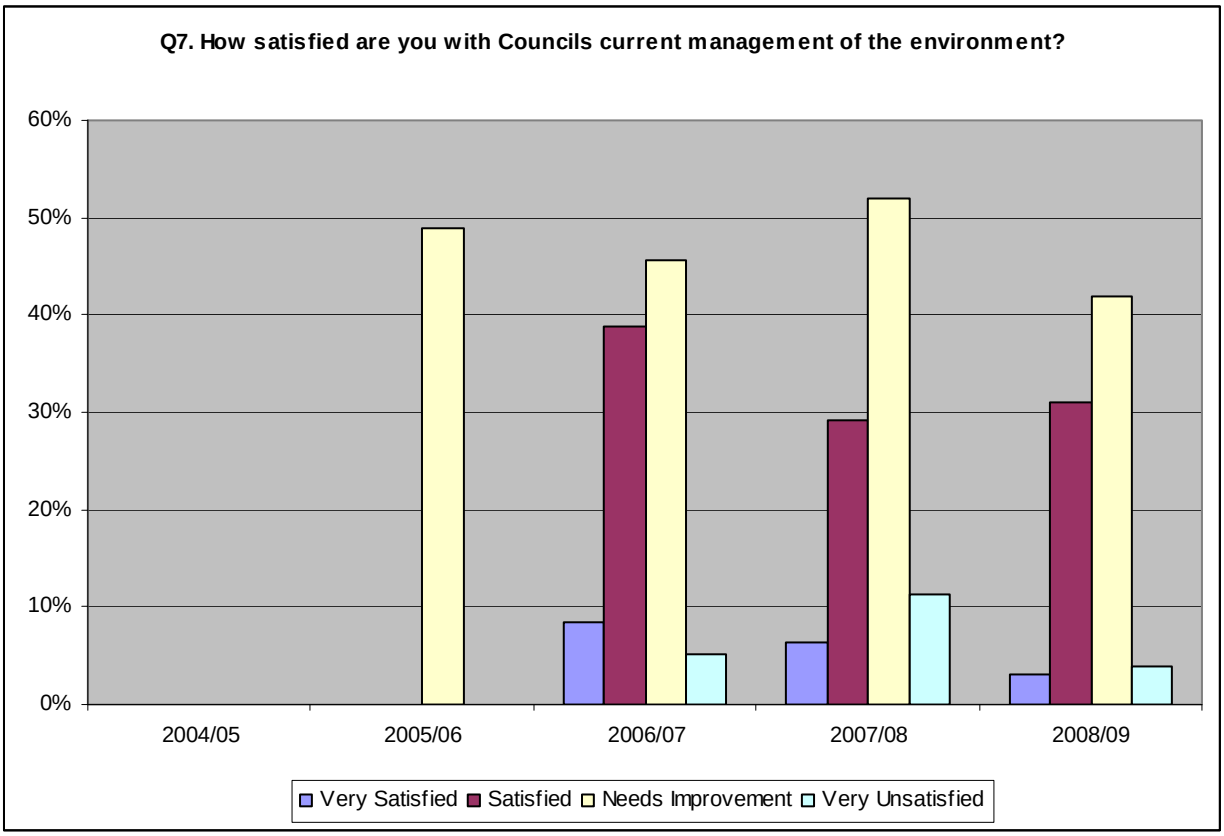

Figure 76

As with most of the other questions, there is only 3 years worth of complete data (see Figure 76). Over those 3 years however there has been a general decline in the satisfaction of Councils management of the environment, and an increase in the perception of the need for improvement.

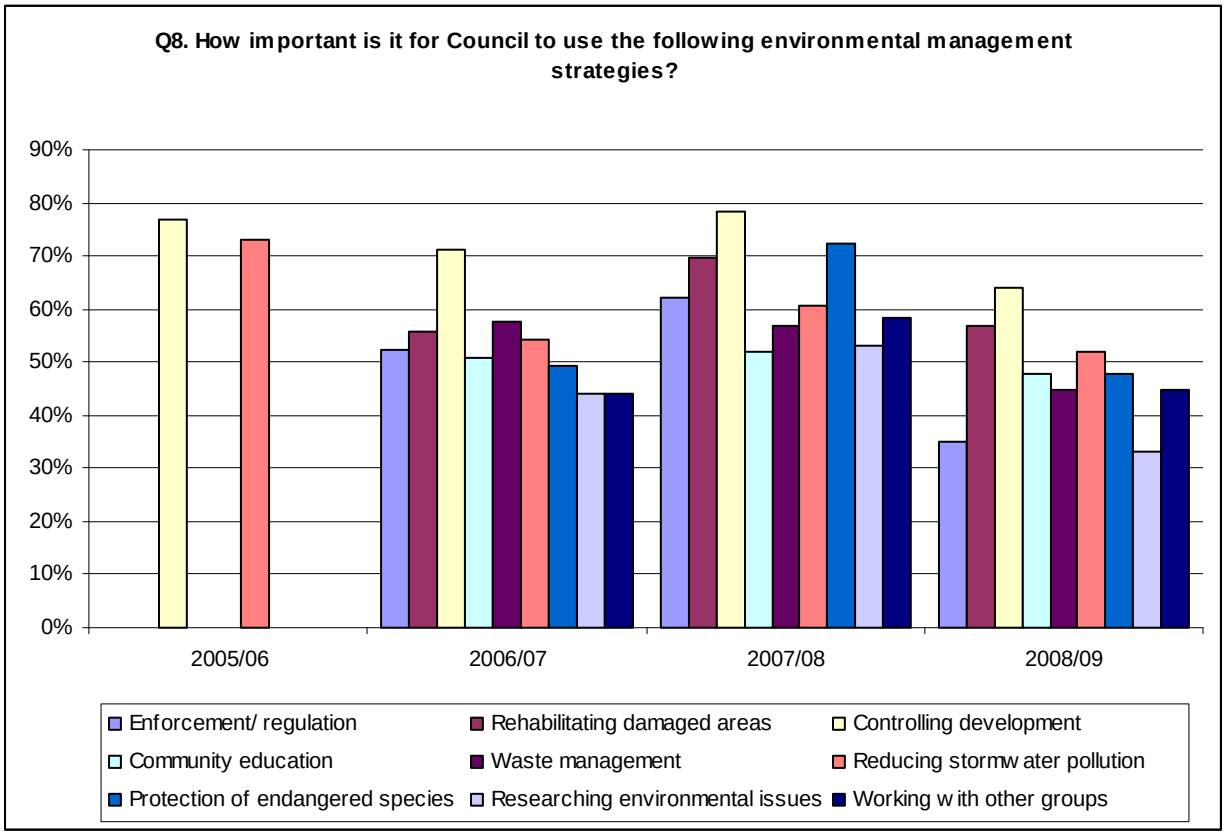

Figure 77

Controlling development, reducing stormwater pollution and the rehabilitation of damaged areas appears to be what the community feels is important for council to take action on (Figure 77). Again it should also be noted that the data set from these conclusions are drawn are incomplete, and can only be made on the last three years worth of data.

Summary

The results indicated a high level of awareness and concern about the Great Lakes environment, with a range of issues identified. The residents generally felt a strong attachment to the local environment and were particularly concerned with ongoing environmental decline through pollution, over-development and loss of biodiversity. The results also indicated a good awareness of Council environmental initiatives and support for all initiatives and management strategies through which Council can help improve or protect our environment.

The results from this survey will be used to inform future education programs and environmental strategies.

10.2 Community Submissions

To encourage feedback from the general community, Council sourced information from a number of environmental groups and progress associations throughout the LGA. Submissions were received from the Frewins Walk Group, North Arm Cove Residents Association, One Mile Beach Dune Care, and the Pindimar Bundabah Community Association. A summary of these submissions has been provided below.

Two other groups, the Wootton Weeders and the Bungwahl/Tarbuck Bay & Districts Community Action Group completed surveys rather than provide submissions. These surveys are included in the survey results in the above section 10.1.

Frewins Walk Group

For the period of 1st July 2008 to 30th June 2009-08-20

Our group consists of 5 active members and we meet on site (Frewins Walk area on the southern end of Pebbly Beach) every Friday from 7:30am to 10am.

1. We maintain the grass areas at the top parking area to the lower access entrance adjacent to the primary school area
2. Weeds in the bush areas are a continuous job for 2 or 3 of our group
3. Rubbish and weeds along the walking track also need regular attention
4. Pruning of trees and other vegetation growing along the walkway is regularly required.
5. We thank the Council for the assistance in spraying weeds etc. along the pathway and bush areas. Also for supplying young rainforest trees where required.

North Arm Cove Residents Association

Environmental Issues of concern to NACRA

1. The lack of adequate stormwater drainage and silt traps in the village, resulting in scouring of road verges and subsequent sediment run-off entering North Arm Cove

2. The need to remove derelict oyster racks from the foreshores of the Cove. Whilst Great Lakes Council is not directly responsible for this, it could lobby the relevant authorities to ensure that this is carried out.

3. Lack of hazard reduction burning around the village leaves the area vulnerable to wildfire with its subsequent destruction of native vegetation and fauna habitats (also the possible destruction of much of the built environment). If this is not Council's direct responsibility, then once again it could lobby the relevant authorities.

One Mile Beach Dunecare

Environmental Issues of Concern

The One Mile Dune Care Group is very concerned about the condition of the water flowing from the creek into the ocean on One Mile Beach.

During 2008/09, the John Ward board walk has been extended from the existing board walk across a very substantial new bride and further along behind the dunes. The bridge crosses One Mile Creek, which drains the golf course and adjacent residential areas. In periods of substantial rainfall this creek flows across the beach into the pristine ocean.

This year during big seas, high tides and heavy rainfall, the creek has become extremely polluted and smelly adjacent to the bridge.

This walkway is very popular and is constantly used and enjoyed by locals and tourists who remark on the fact that it is in a polluted condition and then drains into the ocean.

The One Mile Dune Care Group has 28 members working diligently in two groups (Wednesdays and Saturdays) each week caring and maintaining a clean and healthy dunal system and vegetation.

Our group would like to suggest that Council and the Golf Club combine to consider suitable ways to clean up this creek, which appears to be polluted with chemicals and other foreign matter (such as plastic containers, cans and bottles).

Perhaps a settling pond and litter trap could be installed upstream of the bridge.

The One Mile Dune Care Group would be prepared to help with cleaning and maintenance however we are mostly seniors and could not be involved in heavy construction work.

Other concerns of the group are:

- Stormwater entering the ocean in a polluted condition at the southern end of the beach
- An increase in the number of feral foxes in the dunal areas and surrounding housing developments

The One Mile Dune Care Group would like to express its appreciation for the ongoing support of Council and Council staff for our work and thank you in anticipation of further discussions.

Pindimar Bundabah Community Association

The Environmental issues that concern our group most are:

- Healthy water ways,
- protection of foreshore,
- improving local wild fish stocks,
- sustainable development,
- sustainable agriculture
- protection of environment and values.

Our group has been involved in:

- Clean Up Australia Day 2008
- Removing weeds (Bitou Bush and cactus) from foreshore
- Swift Parrot and Dolphin Surveys for 2008
- Promoting protection of local environmental assets within the communities
- Promotion of sustainable development and agriculture within the communities
- Attending local meetings & participate in regional networks to progress environmental issues

We think Council and the Community should help improve the state of our environment by:

- Council officers should actively enforce environmental protection regulations and policies (eg breaches on SEPP 14 wetlands, illegal clearing of native vegetation)
- Individuals should work together to protect and enhance environmental values (planting trees, land management practices and sustainable living practices).
- Council and Community should work together to do the above. Council Officers need to be supportive and encourage community engagement in protecting and enhancing environmental assets; sometimes community members feel that Council officers are critical of local complaints or concerns about environmental destruction or degradation.

10.3 Community Volunteers

Great Lakes Council facilitates and supports many voluntary groups that work on council property across the LGA. This includes, weeding, revegetation works, water quality monitoring and an underwater group. The following table provides and outline of the groups and their main activities.

Group	Work Location	Vegetation Community	Weeds	Main tasks (Group)	Meeting Time / Frequency
Blueys Beach Dunecare	Blueys Beach	Coastal Heath with Littoral Rainforest patches (on headland and at southern end of beach).	Bitou (*Chrysanthemoides monilifera* var. *rotunda*), Senna (*Senna pendula* var *glabrata*, Mother of Millions (*Bryophyllum* sp.), Lantana (*Lantana camara*), Turkey Rhubarb (Acetosa sagitatta), Glory Lily (*Gloriosa superba*), Gazania (*Gazania rigens*), Asparagus Fern (*Asparagus aethiopicus*)	Bitou Bush removal along beach, Asparagus Fern on Headland Trail, Senna, Lantana	One Saturday per month, 2-3 hours
Bennetts Head Landcare	Bennetts Head	Themeda Grassland next to cliff, with scattered rainforest patches, adjacent to large mown areas. Large rainforest area to the south of LookOut	Lantana (*Lantana camara*), Mother Millions (*Bryophyllum* sp.), Madiera Vine (*Anredera cordifolia*), Paspalum, Kikuyu.		Friday mornings, 2-3 hours.
Boomerang Beach DuneCare	North Boomerang	Coastal Heath / Scrub, Tuckeroo patches throughout (hind dune and in southern area near toilet), Themeda Grassland at foot of Boomerang Head.	Main threat = Bitou (*Chrysanthemoides monilifera* var. *rotunda*), also Asparagus fern (Asparagus aethiopicus), Senna (*Senna pendula* var *glabrata*), Gazania (*Gazania rigens*), and Lantana (*Lantana camara*)	Working from northern end, targeting bitou and other emergent weeds, replanting.	Thursday mornings, 8:30am, 2-3 hours
Burgess Beach CoastCare	Burgess Beach	Littoral Rainforest, with *Cynanchum elegans* (3 populations).	Climber weeds (see mgt plan), Senna (*Senna pendula* var *glabrata*), Lantana (*Lantana camara*), Bitou (*Chrysanthemoides monilifera* var. *rotunda*)	Awaiting approval to commence works	Monday mornings, 8am, 2-3 hours
Burraneer Saltmarsh	Burraneer Road	Saltmarsh, Mangrove, Casuarina / Sclerophyll forest	Lantana, Senna, Ipomoea, White Passionflower, *Asparagus aethiopicus, Araujia hortorum*	Primary and follow-up weeding	As required (only one volunteer)
Coomba Aquatic Club Landcare	Coomba Aquatic Gardens	Wetland - Saltmarsh, Casuarina / Palm Forest; Peninsula - Eucalyptus tereticornis/ spotted gum/ casuarina, with rainforest emergents along southern flank.	Moth Vine (*Araujia hortorum) Passiflora suberosa, Ipomoea cairica, Asparagus aethiopicus, Asparagus asparagoides, Senna pendula* var. *glabrata*, *Senecio mikanioides*	Ground Maintenance (Mowing, track maintenance, amenity maintenance), follow-up weeding on peninsula bushland and wetland.	Thursday mornings, 8:30am, 2-3 hours
Coomba Foreshore Group	Coomba Foreshore	Swamp Oak, Forest Red Gum with rainforest emergents.	Lantana *(Lantana camara*), Madiera Vine (*Anredera cordifolia*), *Passiflora subpeltata, Ipomoea cairica, Asparagus aethiopicus*, Grass weeds (Rhodes, Panic Veldt, Kikuyu).	Most of the primary weeding is complete (Lantana removal along path), follow-up weeding of vine weeds and lantana, planting.	Tuesday mornings, 9am, 2-3 hours
Coomba Road Saltmarsh	Opposite 16 Coomba Road	Saltmarsh, Mangrove, Mown edges	*Asparagus aethiopicus, A. asparagoides, Ipomoea cairica, Araujia hortorum*.	Follow-up weeding, planting	As required

Group	Work Location	Vegetation Community	Weeds	Main tasks (Group)	Meeting Time / Frequency
Darawank Park	Wallamba River, Darawahk	Mown park, with Casuarina edge along Wallamba	Mother of Millions, *Senna pendula* var. *glabrata*, *Lantana camara, Cinnamomum camphora, Ipomoea indica*	Mowing, planting	Weekly, Thurs morning 8-10am
Friends of Booti Booti - Elizabeth Beach (NP)	Elizabeth Beach	Littoral Rainforest, Coastal Scrub	Climbing Asparagus (*Asparagus plumosus*), Lantana (*Lantana camara*), Bitou (*Chrysanthemoides monilifera* var. *rotunda*)	Track fence posts removed, primary weeding along track completed	Inactive
Friends of Booti Booti - Shelley Beach (NP)	Shelley Beach	Littoral Rainforest, Coastal Scrub (including Melaleca armillaris stands), Coastal Heath, Themeda Grassland, Wet and Dry Sclerophyll forest	Lantana *(Lantana camara*), Bitou (*Chrysanthemoides monilifera* var. *rotunda), Passiflora subpeltata, Araujia hortorum*	Followup weeding around Shelley beach and up to fire trail.	Third Thursday of each month; 8am, 3 hours
Friends of Pebbly Beach	Bennetts Head	Littoral Rainforest (Frewins Walk), Coastal Scrub (Banksia, Themeda).	*Asparagus aethiopicus, Lantana camara, Tradescantia albiflora, Senna pendula* var. *glabrata, Senencio mikanoides, Ipomoea cairica, Ehrharta erecta*	followup weeding, track maintenance, mowing, landscaping	Friday mornings, 7:30am, 2-3 hours.
Green Point CoastCare	Green Point Foreshore	Casuarina, Palm Forest, Forest Red gum with rainforest emergents	*Ipomoea indica, I. Cairica*, *Senna pendula* var. *glabrata*, *Asparagus aethiopicus, Lantana camara, Tradescantia albiflora*	follow-up weeding, planting,	Thursday mornings 8:30am, 2-3 hours
Myall Koala & Environmental Support Group	Koala Reserve, Hawks Nest	Various, Swamp Mahogany, Broad-leaved Paperbark, Blackbutt	*Ipomoea indica, I. Cairica, Senna pendula* var. *glabrata, Asparagus aethiopicus, Lantana camara, Tradescantia albiflora, Chrysanthemoides monilifera* var *rotunda*.	follow-up weeding, planting,	Various
Nabiac Landcare	Bullocky Wharf, Nabiac	Swamp Oak, Forest Red Gum with rainforest emergents.	*Ligustrum lucidium, Cinnamomum camphora, Lantana camara, Tradescantia albiflora*	follow-up weeding, planting,	Wednesday mornings, 8-11am
One Mile DuneCare	One Mile Beach	Littoral Rainforest with *Cynanchum elegans*	Yucca, *Asparagus aethiopicus, Senecio mikanoides, Ipomoea cairica, I. Indica, Solanum seaforthianum, Ochna serrulata, Senna pendula* var. *glabrata*	follow-up weeding, planting	Weekly, Wednesday morning, 8:30am, 2-3hours
Pindimar CoastCare	Pindimar Foreshore	Mangrove, mown foreshore with scattered remnant trees	Opuntia, Bitou (*Chrysanthemoides monilifera* var. *rotunda), Gazania rigens*	weeding	Various
Smiths Lake Foreshore Group	Frothy Coffee, Smiths Lake	Swamp Oak/Broad-leaved Paperbark; Dry Sclerophyll Forest (Grey Gum, Spotted Gum; Blackbutt, Angophora) with rainforest patches (in gullies) and heath on sand hills.	*Lantana camara, Olea africanus, Chrysanthemoides monilifera* var. *rotunda, Ipomoea indica, Thunbergia elata, Asparagus aethiopicus*	follow-up weeding	Weekly, Wednesday morning, 9am, 2-3hours
Smiths Lake Landcare	Cellito Beach	Littoral Rainforest, Coastal Scrub, Themeda Grassland on Sea-cliffs	Bitou (*Chrysanthemoides monilifera* var. *rotunda*), Senna (*Senna pendula* var *glabrata*, Lantana (*Lantana camara*), Cape Ivy (*Senecio mikanoides*), Moth Vine *(Araujia hortorum*), Brazillian Nightshade (*Solaum seaforthianum*)	follow-up weeding , planting, garbage removal,	Weekly, Monday morning, 8-11am

Group	Work Location	Vegetation Community	Weeds	Main tasks (Group)	Meeting Time / Frequency
The Sanctuary Group	The Sanctuary, Forster Community Nursery, Tuncurry	Broad-leaved Paperbark; Wet heath; Angophora/ Blackbutt/ Banksia	*Cinnamomum camphora, Lantana camara, Lonicera japonica, Senna pendula* var. *glabrata, Ochna serrulata*	follow-up weeding; Nursery work	Weekly, Tuesday morning, 8-12
Tarbuck Bay BushCare	Tarbuck Foreshore	Swamp Oak / Eucalyptus grandis	*Ipomoea cairica, Thunbergia elata, Chrysanthemoides monilifera* var. *rotunda, Lantana camara, Senna pendula* var. *glabrata*	Currently only mowing	Inactive
Tuncurry DuneCare	Tuncurry Beach	Coastal Scrub / Tuckeroo	Asparagus aethiopicus, Lantana camara, Senna pendula var. glabrata, Ipomoea cairica, Gloriosa superba	follow-up weeding, planting, rubbish removal	Weekly, Friday mornings 8:30am, 2-3 hours
Tuncurry Flora Reserve	Tuncurry Flora Reserve	Blackbutt / Angophora	-	follow-up weeding , planting, garbage removal,	Weekly, Monday 9-11am
Seal Rocks Community Group	Seal Rocks Headland	Littoral Rainforest	Asparagus plumosus, Senna pendula var. glabrata, Chyrsanthemoides monilifera var. rotunda, Asparagus aethiopicus	follow-up weeding, rubbish removal	Quarterly, Saturday mornings 9am, 2-3 hours
North Arm Cove Environment Group	Cove Bvd Foreshore Reserve	Dry Sclerophyll Forest	Asparagus aethiopicus, Lantana camara, Chrysanthemoides monilifera var. rotunda	Primary and follow-up weeding	Weekly, Thurs morning 8-10am
Great Lakes Underwater Group	Blackhead to Port Stephens near shore reefs.	Marine	None found to date	Monitoring marine biodiversity and collecting marine debris	Various
Dad's Navy	Pipers Creek	Estuarine	None found to date	Estuarine clean-up, water quality testing	As needed
Forster Community Gardens	Penenton Creek	Sub-tropical rainforest on Floodplain; mangrove. Riparian	Anredera cordifolia, Senna pendula var glabrata, Asparagus aethiopicus, Lantana camara, Cinnamomum camphora, Neph	Vegetable gardens and riparian regeneration	Tuesday mornings, 9am, 2-3 hours
Great Lakes Coastal Land Management Network	Region Wide	N/A -	N/A -	Representative Committee formed to discuss coastal priorities for volunteer groups and funding in the Great Lakes Area.	Meet quarterly

Response

Council will continue to support the actions of community groups involved in on-ground environmental management activities.

Table 10. Identified need for action regarding community involvement

Identified Need for Action	**Recommended key projects or actions** for consideration in next year's Management Plan	Relevant Council section	Are there existing resources for action Y/N	Commence by/ Timeframe
Continue to implement actions that target improvements in and protection of water quality (area of significant community concern)	• Implement actions identified in the Water Quality Improvement Plan • Wallis Lake Catchment Management (progress implementation), • Healthy Lakes Program (continue and expand initiatives)	Natural Systems	Y	Ongoing
Continually develop actions to address issues recognised as very important to the community, such as protection of vegetation and biodiversity and the control of development so that it is sustainable and environmentally appropriate.	Implement Sustainability Strategy	Natural Systems, Whole of Council	Y	Ongoing
Develop and implement an education program aimed at increasing the empowerment of community members to have input into environmental management	Develop Education for Sustainability strategy and environmental initiatives	Natural Systems	Partial	Within 2yrs
Recognise the preference of the community for information on environmental issues to be sourced from newspapers and utilise this in education initiatives (and education strategies)	Develop Education for Sustainability strategy and environmental initiatives	Natural Systems	Y	Ongoing

11 Environmental Plans and Strategies

It is generally recognised that sound environmental management and the achievement of key environmental outcomes needs to be based on effective planning principles. Consequently, Great Lakes Council has developed a range of Plans and Strategies to guide natural resource management and identify/ implement high priority actions across a range of natural resource management issues. This includes catchment and estuary management, urban stormwater management and threatened species recovery planning.

The State of the Environment reporting framework is an ideal vehicle in which to achieve enhanced and strategic natural resource management. One of its key aims is to report on environmental achievements, but also this revised SoE procedure is intended to formulate a holistic and strategic action plan that addresses priorities and which is incorporated in the Management Plan, budget and work plan program. In this manner, the SoE can identify and describe the actions within relevant plans and strategies, report on achievements and outline and propose models to address priority actions within a strategic and holistic manner. This process will ensure that important and well resourced plans and strategies are not ignored or inadequately referenced.

The relevant environmental plans and strategies that are active, operational and in the process of being implemented with Council as a lead agency or nominated partner are listed below against a summary of their progress. A more detailed outline of the achievement of Council's projects and programs arising from the plans are found in Appendix 1, Great Lakes Councils Environmental Special Rate Report 2009.

Table 11: Relevant active plans and strategies

Water Quality Improvement Plan, Wallis, Smiths and Myall Lakes Great Lakes Council 2008				
Number of Actions	Actions completed or ongoing	Actions commenced	Actions yet to commence	Planned Review
44	19	3	22	2015
Smiths Lake Estuary Management Study and Management Plan Webb McKeown & Associates 2001				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
54	21	3	23	Overdue
Wallis Lake Catchment Management Plan Great Lakes Council 2003				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
95	46	16	31	Overdue
Lower Wallamba River Rivercare Plan Skelton, S 2003				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
23	12	3	8	-

Wallis Lake Estuary Management Plan Great Lakes Council 2005				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
158	52	40	65	2010
Darawakh Creek and Frogalla Swamp Wetland Management Plan WetlandCare Australia 2004				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review date**
15	7	5	3	-
Hawks Nest and Tea Gardens Endangered Koala Population Recovery Plan NSW DEC 2004				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
21	4	14	3	2007
Wallis Lake Stormwater Source Control Study Jelliffe Environmental 1999				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
26	**11**	**5**	**6**	**-**
Tea Gardens, Hawks Nest and Bulahdelah Stormwater Management Plan Jelliffe Environmental 2000				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
No data	No data	No data	No Data	No Data
Port Stephens/ Myall Lakes Estuary Management Plan Umwelt (Australia) 2000				
Number of Actions	**Actions completed or ongoing**	**Actions commenced**	**Actions yet to commence**	**Planned review**
68	10	12	46	Overdue

To maintain a strategic approach to environmental management the progress of these plans and strategies need to be reviewed annually. An annual review of environmental plans and programs should also be used to evaluate the effectiveness of these programs in improving the environment. Obviously, this review should be based on the findings and outcomes of this SoE report, with specific reference to the outcomes of the key environmental indicators. Further, the results of the community survey should be considered as this outlines those key aspects of environmental management that are important to the Great Lakes community. The outcomes of this review should be reflected in the management systems of Great Lakes Council and be reported in subsequent SoE reports.

12 Acronyms & Abbreviations

DECCW	Department of Environment, Climate Change & Water
DNR	Department of Natural Resources
DPI	Department of Primary Industries
ESD	Ecologically Sustainable Development
GIS	Geographic Information System
GLC	Great Lakes Council
GPT	Gross Pollutant Trap
GTCC	Greater Taree City Council
HCRCMA	Hunter Central Rivers Catchment Management Authority
HRC	Healthy Rivers Commission
LEP	Local Environment Plan
LGA	Local Government Area
MER	Monitoring Evaluation and Reporting
MCW	MidCoast Water
NPWS	National Park and Wildlife Service
NRM	Natural Resource Management
NSW	New South Wales
OECD	Organisation for Economic Corporation and Development
PAL	Participatory Action Learning
POEO Act	Protection of the Environment Operations Act
PSR	Pressure – State – Response
SoE	State of the Environment
TPO	Tree Preservation Order
WONS	Weed of National Significance
WQIP	Water Quality Improvement Plan
WSUD	Water Sensitive Urban Design

13 Appendix 1 - ESR Report

GREAT LAKES COUNCIL

ENVIRONMENTAL SPECIAL RATE

SUMMARY OF ACHIEVEMENTS 2004 – 2009
AND
JUSTIFICATION FOR INCREASE AND PERMANENT ESTABLISHMENT

Prepared by:
Natural Systems, Great Lakes Council

Great Lakes COUNCIL

22nd April 2009

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List of Acronyms Used

CAP	Catchment Action Plan
CCI	Coastal Catchments Initiative
CFOC	Caring for Our Country
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DA	Development Application
DEWHA	Department of Environment, Water, Heritage and the Arts
DOTARS	Department of Transport and Regional Services
DECC	Department of Environment and Climate Change
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EMS	Environmental Management Strategy
ESD	Ecologically Sustainable Development
ESR	Environmental Special Rate
FLALC	Forster Local Aboriginal Land Council
GLC	Great Lakes Council
GLUG	Great Lakes Underwater Group
GHG	Greenhouse Gas
GPT	Gross Pollutant Trap
GTCC	Greater Taree City Council
HCRCMA	Hunter/ Central Rivers Catchment Management Authority
HLP	Healthy Lakes Program
IWCMP	Integrated Water Cycle Management Plan
KLALC	Karuah Local Aboriginal Land Council
KWG	Koala Working Group
LEP	Local Environmental Plan
LGA	Local Government Area
LGMA	Local Government Managers Australia
LGSA	Local Government and Shires Association
MCW	MidCoast Water
MP	Management Plan
NHT	Natural Heritage Trust
PAL	Participatory Action Learning
NPWS	National Parks and Wildlife Service
NRM	Natural Resource Management
NSW	New South Wales
SLEMP	Smiths Lake Estuary Management Plan
TIDE	Taree Indigenous Employment and Development
WSD	Water Sensitive Design
WSUD	Water Sensitive Urban Design
WQIP	Water Quality Improvement Plan

14 INTRODUCTION

14.1 Background

The Great Lakes Local Government Area (LGA) contains a range of outstanding natural values, including significant coastlines, rivers and lakes, diverse vegetation communities as well as habitats for biodiversity and threatened species.

The basis of the economy of the region depends upon the maintenance of, and in some cases, the repair, of the natural systems and landscapes. This would ensure the continued sustainability of industries such as tourism, fishing, oyster growing, grazing production and sustainable timber production.

Where natural values and functions have been depleted or impaired through past land use pressures or inappropriate management, the objective of environmental management must be to identify the risks, threats and pressures and to implement measures to actively restore the natural systems and re-establish the natural functions and processes.

This was graphically represented by the Wallis Lake Hepatitis A contamination event during 1996 and 1997, which served as a wake-up call to recognise and acknowledge the link between the health of the environment and the local economy and the real value of healthy, functioning natural systems and landscapes. This single tragic event provided the motivation to focus greater awareness and management strategies on catchment and environmental health.

In the wake of the Hepatitis event in Wallis Lake, Great Lakes Council moved quickly to establish the Wallis Lake Catchment Management Plan Steering Committee, whose primary role was to oversee the production of the Wallis Lake Catchment Management Plan. During the preparation of the Plan, it was recognised that ongoing, recurrent environmental funding was critical to facilitate and deliver on-ground environmental outcomes, including both protection of existing assets and values as well as restoration of degraded or impaired landscapes.

This was not only associated with Wallis Lake, but identified as a need to achieve an enhanced environment for the benefit of the LGA as a whole.

Consequently, the need for an Environmental Special Rate (ESR) was identified.

Prior to the ESR, Council's environmental expenditure was approximately $90,000 per annum, plus what could be matched through State and Federal Government grants.

The concept of the ESR was initially raised in 1999, as a direct response to the identification of priority actions identified in the Wallis Lake Catchment Management Plan Community Issues Paper and Draft Interim Action Plan. Community participation in the planning process strongly supported a special environmental rate. Council received widespread community and industry support for a 5% ESR. As such, the concept was given in-principle support in 2000 and subsequently approved by Great Lakes Council in 2001, following the receipt of 35 letters of support for and only 3 letters against the ESR from the community.

The community support for a rate rise was a clear demonstration of the benefits of the clear and active consultation as well as community recognition of the need to better protect, manage and restore the environment.

During 2001, the Minister for Local Government approved the establishment of an ESR for Great Lakes Council over a three-year period between 2002 and 2004.

An application to extend the ESR for an additional ten years was submitted in 2004 with approval granted for a five year extension of the program by the Ministers office through to 2009.

The approved rate of the ESR was 3.89%, which has yielded funding of natural resource management programs and outcomes across the LGA (**Table 1**). The ESR has delivered outstanding community benefits and attracted substantial external funding. This is discussed further below.

This report demonstrates how these funds have been utilised in wide-ranging environmental programs across a range of project areas, including water quality, catchment and estuarine health and restoration, biodiversity and threatened species management and community education for sustainability.

This report focuses on the period 2004 to 2009.

Table 1 Environmental Special Rate Proceeds 2002 to 2009

Year	ESR Funding Proceeds
2002	$500,000
2003	$516,500
2004	$593,768
2005	**$611,600**
2006	**$634,561**
2007	**$768,068**
2008	**$710,694**
2009	**$743,756**

Importantly, the ESR funds have been consistently used by Great Lakes Council to successfully lever additional external State and Commonwealth funding, to increase the environmental expenditure. During the last 5-years, the ESR generated some $3,468,679 to which there was $9,732,985 of additional and external contributions, yielding a total expenditure on the environment of **$13,201,664** ($2.64M per year on average). As such, the ESR was, on average, multiplied by 2.8-times in external funding support over the last 5-years. This is a spectacular result, demonstrating the significant and critical value of the ESR to the improvement and management of the local and regional environment and the attractiveness of the environmental programs of Great Lakes Council for co-investment by the State and Commonwealth Government.

The outcomes from the ESR continue to gain momentum and goodwill from the community because it has achieved significant on-ground outcomes and benefits and has exhibited sound and effective leadership, extension and empowerment by Local Government. Great Lakes Council is recognised for its achievements in estuary and catchment management.

This is important because Local Government is a primary land management authority and is the tier of government that is closest to the community.

The ESR has been used to address past environmental problems, implement appropriate natural resource management plans, instigate actions to proactively prevent future environmental problems and provide support for improved management of both public and private lands. It has been used to invest in the treatment of environmental issues that affect sustainability and reverse the cost burden to the local community associated with degradation and repair. A key element of the ESR expenditure has been associated with partnerships to achieve strategic, agreed environmental outcomes.

As such, the ESR has been effectively and relevantly expended for the betterment of the LGA, the community and the regional economy.

14.2 Purpose and Objectives of this Report

The overall purpose of this report is to profile the environmental outcomes and achievements of the ESR for the period 2004 to 2009 and outline the future directions of natural resource management within Great Lakes including an estimate of proposed future expenditure.

The report aims to fully justify to the Minister of Local Government the critical need for the ESR to be increased and to be permanently established within the Great Lakes LGA.

This is important so that the results and outcomes achieved to date can be effectively consolidated, the community support that has been established can be further developed and that the significant momentum in protecting, conserving and restoring the environment of the Great Lakes can be maintained and improved.

The objectives of this report are to:

- Provide a summary of the projects and outcomes facilitated through the ESR during the period 2004 to 2009;
- Provide details of the budget of the ESR, including the matching contributions from external funding sources;
- Outline a proposed strategy for the future direction of the program to capitalise and extend upon the considerable momentum generated to date, including a five-year proposed expenditure table; and
- Provide justification for permanent establishment of an increased ESR to adequately service the future environmental programs and strategies identified.

15 ESR ACHIEVEMENTS

15.1 Introduction

The Great Lakes Council ESR has achieved demonstrable, significant and outstanding environmental outcomes during the period 2004 to 2009 across a range of project areas, including (but not limited to):

- Employment of natural resource professionals across a range of skill areas
- Water quality protection and improvement
- Estuarine and catchment protection and management
- Rural land management
- Sustainability
- Biodiversity conservation and management including vegetation conservation and threatened species management
- Community education and engagement

The net gains resulting from the practical, educative and research and planning initiatives facilitated by the ESR will have lasting benefits to the condition and integrity of the Great Lakes natural environment.

Furthermore, given that the Great Lakes economy critically depends upon the condition and integrity of the environment to support tourism and production industries (fisheries, oysters, grazing), these projects will also be associated with a range of social and economic benefits and outcomes.

It could reasonably be argued that the improvements in productivity of the natural environment and the remediation of environmental degradation and disrepair combined with the resultant economic and communal benefits associated with the ESR would, over time, exceed the ESR expenditure for the betterment of the entire LGA and for a net positive economic outcome.

Many of the projects established through the ESR are innovative and dynamic, with the knowledge and the outcomes shared amongst other agencies and authorities in a manner that will benefit environmental management systems on a whole. Several projects undertaken by Great Lakes Council that are facilitated by the ESR have achieved national and state recognition and awards.

Projects such as the Sustainability Strategy, Wallis Lake Wetlands Strategy and the Water Quality Improvement Plan for Wallis, Smiths and Myall Lakes are all fine examples of the effective, dynamic and innovative approach adopted in planning for the environment and in empowering the community.

This has been duly recognised by relevant awards, including but not limited to:

- **Winner Overall and Winner Division B: LGSA Excellence in the Environment Awards Biodiversity Management Award 2008**
- **Winner Overall and Winner Division B: LGSA Excellence in the Environment Awards Integrating Natural Resource Management in Planning 2008**
- **Highly commended: LGMA Sustainability Award 2008**
- **Winner: National Riverprize 2004**
- **Runner-up: National Riverprize 2003**

As importantly, the successes have been recognised by the community in respect to the enhanced quality of the local environment.

In this report, we have provided a summary of the employment facilitated by the ESR and the range of projects and outcomes that have been achieved over the five year period of program implementation between 2004 and 2009.

This information is used to provide the justification for permanent establishment of an increased ESR to ensure that the considerable momentum generated to date can be sustained and accelerated and that the current outcomes can be consolidated and extended.

15.2 Employment

The ESR has been utilised for the establishment of a dynamic and effective Natural Systems Branch, which operates under the Planning and Environment Division, at Great Lakes Council

Presently, the team contains nine (9) members, who individually and collectively, design, deliver, manage and review the environmental programs and administration of the ESR. Overall, this team has effectively incorporated sustainable natural resource management protocols and policies as a viable, functioning and effective core function of Great Lakes Council. The team consists of four (4) permanent staff, three of which are core-funded through the ESR and five (5) temporary staff funded through grants and project funds. The Branch currently comprises the following staff:

Position	Current Personnel	Summary of key duties and responsibilities
Manager – Natural Systems	Mr Gerard Tuckerman	o Management and financial responsibilities o Staff supervision o Overall program reporting/ review o Technical expert – water quality and treatment o Post-graduate training – sustainability
Coastal Catchments Initiative Coordinator	Ms Prue Tucker	o Management – water quality improvement program o Coordinates implementation of water quality program o Budgeting, reporting and review o Facilitates estuary management programs
Catchment Coordinator*	Ms Stacey Tyack	o Management – rural sustainability programs o Management – catchment programs o Facilitator of rural education programs o Technical expert – environmental education
Catchment Officer*	Mr Joël Dunn	o Assists with rural sustainability programs o Assists with catchment programs o Delivers rural education programs o Recognised expertise in community extension
Sustainability Coordinator	Ms Naomi Soustal	o Management – urban sustainability programs o Coordinates integrated sustainability outcomes o Recognised expertise in environmental education o Facilitates community education programs
Senior Ecologist	Mr Mat Bell	o Management – biodiversity/ ecology programs o Technical expert – ecology/ impact assessment o Coordinates vegetation management programs o Post-graduate training – restoration ecology
Coastcare/ Bushcare Officer*	Ms Isabelle Strachan	o Facilitates and coordinates community programs o Management – marine education and research o Assists and coordinates funding bids o Project management and reporting
Environmental Officer	Ms April McKay	o Coordination – environmental education o Author – State of the Environment reporting o Facilitates community environmental programs o Assists marine education and water quality programs
Assistant Environmental Officer	Mr David Hopper	o Assists with environmental projects o Supervises on-ground works o Assists with program reporting o Contributes to funding bids and reporting of outcomes

* *These positions are part-funded by the ESR and part-funded by the Hunter/ Central Rivers Catchment Management Authority. As such, project responsibilities are partly aligned to achieving documented outcomes of the HCRCMA Catchment Action Plan*

The Natural Systems Branch forms a technical unit with expertise and skills in diverse project areas including water quality, catchment management, environmental systems, ecology/ threatened species, community consultation and environmental education.

This Branch then significantly and effectively networks with other Officers from all Council departments, including engineering, parks and recreation, corporate and community services and planning.

Furthermore, the Natural Systems Branch facilitates extension and networking with partnering agencies such as the Department of Environment and Climate Change, Hunter Central Rivers Catchment Management Authority, Department of Primary Industries, Department of Local Government as well as the wider community.

15.3 Partnerships and Community Connections

The successes achieved to date through the use of the ESR by Great Lakes Council owes significant gratitude and credit to the agency and organisation partnerships that have been established and fostered and to the connections with the community that have been forged and maintained. This has been the focus of considerable effort by Great Lakes Council as it is recognised that partnerships and community connections add tangible benefit and value to all environmental projects.

Collaborative partnerships between the community and government have been established over a number of years across the Great Lakes. The ability for strong partnerships to deliver complex projects is well illustrated through the process undertaken by Great Lakes Council for the Coastal Catchments Initiative (CCI) and development of the Great Lakes Water Quality Improvement Plan (WQIP) (funded by the Commonwealth Government). The CCI was undertaken in partnership with government agencies, industry groups and the community, with the planning process focused on providing opportunities for awareness raising, capacity building and joint learning. Stakeholders were engaged through a number of different processes, committees and working groups to provide expertise, strategic input and overall direction to the project. The CCI was based on rigorous science and modelling that generated complex information and issues, which nevertheless were communicated and resolved through the determination of partners to deliver the project.

The legacy of the approach to partnership establishment and maintenance is a consortium of partners committed to delivering environmental actions and outcomes across the Great Lakes LGA. This consortium continues to be fostered and expanded to include additional partners and catchment wide land management programs that will not only deliver water quality, but biodiversity enhancement and protection through collaborative, landscape scale actions.

In this respect, Great Lakes Council has forged and maintains effective partnerships with, but not limited to, the following:

- Commonwealth Government:
  - Department of Environment, Water, Heritage and the Arts (DEWHA)
  - Department of Transport and Regional Services (DOTARS)
- NSW Government:
  - Department of Environment and Climate Change (DECC)
  - Hunter/ Central Rivers Catchment Management Authority (HCRCMA)
  - Department of Primary Industries (DPI) – Fisheries and Agriculture
  - Department of Lands
  - Department of Planning
- Local Government and Local Authorities:
  - Greater Taree City Council
  - MidCoast Water
  - Port Stephens Council
  - Hunter Councils Environment Division
  - Mid North Coast Regional Organisation of Councils
- Community-based NRM organisations:
  - Landcare groups (eg. Karuah – Great Lakes Landcare)
  - Coastcare groups
  - Great Lakes Coastal Management Network
- Education institutions:
  - Australian National University – Fenner School of the Environment and Society
  - Great Lakes College
  - Local schools
- Aboriginal community:
  - Forster Local Aboriginal Land Council (FLALC)
  - Karuah Local Aboriginal Land Council (KLALC)
  - Taree Indigenous Employment and Development (TIDE)
- Industry and community:
  - Wallis Lake Shellfish Program
  - Wallis Lake Fish Co-operative
  - Great Lakes urban and rural communities
- National and Regional NRM organisations:
  - Conservation Volunteers Australia
  - WetlandCare Australia

Finally, it is recognised that community engagement underpins all elements of the activities of natural resource management by Great Lakes Council and is integral to successful implementation and outcomes. Great Lakes Council and project partners have a history of successfully engaging the community in capacity building, education, devolved grants and supporting volunteers in NRM works such as bush regeneration, catchment management and water quality monitoring. There remains an ongoing commitment to build on existing programs into the future to build momentum and capitalise on achievements.

In this respect, key efforts shall be devoted to, but not limited to, the following:

- Facilitation of rural participatory action learning groups that aim to achieve a high level of engagement with landholders, empowering individuals to improve sustainable agricultural management practices; and
- Continued engagement of the urban community leading to behavioural change and enhanced environmental outcomes. A significant focus of the urban program shall comprise education for sustainability to better manage and protect water quality. The community program includes a dedicated schools program as well as collaborative partnerships with community groups and individuals across the LGA.

Therefore, it is herein recognised that much of the successes of the ESR to date could have only been achieved through the partnerships and community support that have been identified, fostered and maintained. It is envisaged that the ESR would assist maintain and expand these partnerships and community connections in the future to capitalise on past successes and build on the significant momentum that has been already generated.

16 INDIVIDUAL PROJECT REPORTS

The ESR has, amongst its outputs and outcomes facilitated thirty-two (32) major projects:

- Great Lakes Sustainability Initiative
- Urban Sustainability and Wallis Lake – a partnership approach
- Sustainability Strategy
- Coastal Catchments Initiative
- Structural Solutions for Water Quality
- Great Lakes Catchment Committee and Rural Incentives Scheme
- Rural Land Management Program
- Crawford Catchment Management Plan
- Karuah Catchment Management
- Fish Passage Barriers Project
- Waterwatch Program
- Darawakh Wetland Restoration Project
- Wallamba River Erosion Control
- Smiths Lake Estuary Management Plan Implementation
- Port Stephens Estuary Management Plan Implementation
- Wallis Lake Estuary Management Plan Implementation
- Wallis Lake Wetland Strategy
- Vegetation Strategy
- Biodiversity Conservation Framework
- Threatened Species Management
- Hawks Nest/ Tea Gardens Endangered Koala Recovery
- Common Mynah Control Program
- Coastcare
- Marine Education
- Seagrass Education
- Envirofund Projects
- Cellito Beach Regeneration Program
- Coomba Aquatic Gardens Project
- Smiths Lake Education Program
- School Environmental Education Program
- Healthy Lakes Program
- Environmental Events and Green Dates

Within this report, one-page project overviews have been provided for these below.

16.1 Great Lakes Sustainability Initiative

PROJECT JUSTIFICATION

Councils are required to address sustainability and balance social, environmental and economic values in all aspects of decision making and operations as outlined within the *Local Government Act 1993*. Realistically this is difficult to achieve and the environment, although recognised as the foundation for the regions economics and lifestyle, is often compromised in the process. Together with growing demands on infrastructure, services and our natural assets the need to work more effectively, incorporating sustainability principles is critical to protecting the longevity of the region for current and future generations. As such, GLC is embarking on the preparation, adoption and implementation of a Sustainability Strategy.

Sustainability Advisory Committee Members

PROJECT OBJECTIVES

To work towards a sustainable future Council has focused on achieving several key objectives as a first step in a wider sustainability initiative. Theses initial objectives include:

- To facilitate a collaborative approach to work towards becoming a more sustainable organisation through discussion and on ground action;
- To increase the capacity of staff to incorporate sustainability into their everyday decision-making and operations
- To be leaders in sustainability and showcase our efforts to the local community and businesses
- To guide the development of a sustainability strategy; to coordinate sustainability initiatives within the organisation; and
- To access adequate funding to deliver sustainability projects.

PROJECT DESCRIPTION

The Great Lakes Sustainability Initiative commenced with the development of a sustainability strategy and staff training focused on sustainability principles and their application.

This prompted the need to establish a Sustainability Advisory Committee (S-Team) to facilitate a coordinated approach towards sustainability within the organisation. Comprising representatives from each department, the dedicated team has focused on guiding the development of the Great Lakes Sustainability Strategy, undertaking energy and water audits, providing a forum for discussion and collaboration, offering support to staff undertaking sustainability initiatives in their everyday work practices, working through the Sustainability Health Check to gauge the organisations progress towards becoming more sustainable and accessing $1.16 million to implement tangible sustainability projects such as treated effluent reuse.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$10,000	$0	Staff In-kind	$10,000

PROJECT OUTCOMES / BENEFITS

The initiative, although in its infancy, has delivered considerable outcomes over the past 16-months. These include:

- The formation of a sustainability advisory committee;
- The completion of the sustainability health check;
- The development of the sustainability strategy;
- The undertaking and implementing energy and water audits resulting in reduced energy and water use; and
- Accessing significant funding to deliver tangible sustainability projects.

In addition there is a realisation within the organisation that sustainability makes good business sense and that it requires a whole of organisation approach to be successful signifying a changing in culture and thinking within the organisation.

FUTURE DIRECTION / NEXT STEPS

In the immediate future there is opportunity to incorporate sustainability and its principles into corporate planning processes through the newly proposed integrated planning processes to establish a framework for sustainability and cultural change. The initiative to date has focused on Councils operations and ideally will expand to the wider community. Additionally the initiative will guide the implementation of the sustainability strategies action plan.

16.2 Urban Sustainability and Wallis Lake– a Partnership Approach

PROJECT JUSTIFICATION

The need to be more sustainable makes good business sense with substantial benefits from a social, environmental and economic perspective.

This realisation led to the establishment of a partnership between Great Lakes Council, Greater Taree City Council and MidCoast Water in a collaborative effort to improve the overall efficiency and effectiveness of environmental performance of each organisation and the everyday activities of the Wallis Lake Catchment community.

The consortium was successful in securing significant funding through the State Government to deliver such a program. The initiative will also work towards addressing several actions outlined in several plans and strategies including the Water Quality Improvement Plan and the IWCMP.

The entrance of Wallis Lake at Forster/ Tuncurry

PROJECT OBJECTIVES

The programs objectives are to:

- Increase the capacity of Councils to adopt and implement sustainable water management;
- Investigate opportunities for resource recovery and reuse of oyster shell;
- Improve urban amenity, estuarine health and biodiversity through protecting/ rehabilitating public open space;
- Maintain a healthy Wallis Lake ecosystem through implementing planning procedures, institutional arrangements and policy for water sensitive urban design (WSUD);
- Establish a treated effluent reuse systems and water efficiency; develop GHG initiatives for waste services and water management; and
- Engage the community and Council to develop and adopt procedures to address institutional and systemic change for sustainability.

PROJECT DESCRIPTION

An alliance of local government, business and community has collaborated to ensure the future sustainability of Wallis Lake. The initiative will focus on tackling key sustainability issues such as urban stormwater management, water quality and use, greenhouse gas emissions, waste management, business and household efficiency and effluent discharge, resource conservation and biodiversity and lead to a change in organisational practices to improve overall sustainability.

This will lead to amended/ new policies, systems and procedures that reflect sustainability principles and best practice. The overall program is made up of several projects which include; treated effluent reuse and water efficiency; Environmental Management Strategy (EMS) development; institutional arrangements for WSUD; home and business energy/water audits; wetland restoration and rehabilitation; waste management GHG audit; oyster shell recovery and reuse.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
Various projects	$1,160,000	Staff In-kind	$1,160,000

PROJECT OUTCOMES / BENEFITS

The projects ultimate outcomes include:

- Reduction in acid discharge and heavy metal pollution through wetland restoration;
- Increased community capacity to address sustainability at home and in the workplace;
- Development and implementation of an EMS;
- A documented greenhouse gas emission mitigation action plan;
- Improved water quality resulting from improved policies and procedures;
- A water efficient treated effluent reuse system; oyster shell reuse program established; and
- Good working partnerships established between partnering organisations, business and residents to work collaboratively and progressively towards creating a more sustainable Wallis Lake Catchment.

FUTURE DIRECTION / NEXT STEPS

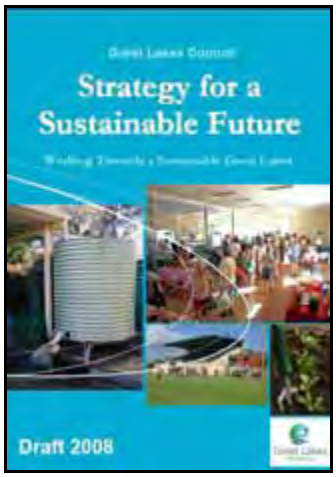
Commencing late in 2008 the program is currently in the initial planning phase and will be implemented over the next three years, due to be completed in October 2011. Outcomes will inevitably extend beyond this timeframe and monitoring will continue beyond this date to establish the full extent of the projects impact. The consortium will continue to foster a good working partnership to address sustainability issues through a collaborative approach and to showcase leadership within the community.

16.3 Sustainability Strategy

PROJECT JUSTIFICATION

Councils are required to address Ecologically Sustainable Development (ESD) principles in decision making as stated in the NSW *Local Government Act 1993*.

The need to develop a sustainability strategy had long been identified within Great Lakes Council's Management Plan to satisfy this obligation. Community expectation also drove this requirement with residents turning to Council for information and leadership on sustainability issues. Funding from the NSW Environmental Trust initiated the development of such a document which has also been driven by the ESR to ensure community environmental values are equally weighted with economic and social considerations well into the future.



GLC Strategy for a Sustainable Future

PROJECT OBJECTIVES

The GLC Strategy for a Sustainable Future was developed as a first step to integrate social, environmental and economic values into everyday operations and decision making. The documents objectives include:

- Providing strategic direction for sustainability programs, initiatives and projects;
- Engaging the community and stakeholders in planning for sustainability and on-ground action;
- Promoting and generating an understanding of sustainability and its principles within council and the community;
- Identifying the communities key sustainability values;
- Providing a framework to work towards delivering the vision for a sustainable future; and
- Facilitating the incorporation of sustainability principles into everyday activities.

PROJECT DESCRIPTION

The strategy utilised the outcomes of several activities which included; a community survey; stakeholder workshops; sustainability staff and councillor training; the formation of a Sustainability Advisory Committee (S-Team); Sustainability Health Check; and Managers Forum workshop.

These methods were instrumental in highlighting the need to focus on Councils' in-house operations and planning, and led to the development of an action plan to progress the initiative further. The process also facilitated community and staff engagement and participation, capacity building and learning by doing opportunities. Importantly, the initiative has generated substantial momentum, acknowledges and builds on existing programs undertaken by Council and community and outlines a framework and clear direction for continual improvement. Actions have since been integrated into Councils Management Plan for implementation.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$20,000	Staff In-kind	$20,000

PROJECT OUTCOMES / BENEFITS

Stage 1 of council's sustainability program has been completed with the adoption of the Sustainability Strategy and integration of actions, to pursue the initiative further, incorporated into the organisations Management Plan. More specifically energy and water audits, infrastructure retrofits, ride to work day promotions and involvement, pilot climate change risk assessment, and resource recovery and reuse are among a variety of projects implemented by staff since the initiative commenced.

The ability of staff to develop and execute these projects clearly indicates their increased awareness of and capacity to identify and tackle sustainability issues for the benefit of the organisation and wider community.

FUTURE DIRECTION / NEXT STEPS

Council's framework for sustainability, outlined within the strategy, is a solid foundation for ongoing improvement and collaboration and will drive the implementation of stage 2 of the initiative. This will focus on the implementation of actions outlined within the strategy with a key focus on further developing the community's vision, objectives and goals for sustainability through the integrated planning process, facilitating organisational and community culture change and pursuing tangible on-ground projects.

16.4 Coastal Catchments Initiative

PROJECT JUSTIFICATION

The ecological, social and economic significance of Wallis, Smiths and Myall Lakes and their catchments have long been recognised at Local, State and International levels.

In recognising this significance, the Coastal Catchments Initiative undertook extensive modelling and scientific research to determine the impact of land based activities on nutrient loads and resulting ecological condition of the estuaries. Through partnerships with the community, agency and industry stakeholders a Water Quality Improvement Plan was produced outlining strategies to improve management of the lakes and their catchments.

Great Lakes Water Quality Improvement Plan

PROJECT OBJECTIVES

The Coastal Catchments Initiative sought to develop a Water Quality Improvement Plan (WQIP) for Wallis, Smiths and Myall Lakes that:

- Identifies the specific levels of nutrients and sediments that are required to support healthy lake ecology;
- Identifies the best way to manage land based activities to reduce loads of sediments and nutrients entering the lakes;
- Reviews the pollution control and faecal coliform management systems; and
- Engages with community members, industries and agency stakeholders to identify water quality issues, environmental values or the waterways and solutions for water quality improvement.

PROJECT DESCRIPTION

The Great Lakes WQIP outlines recommendations for protection and remediation of Wallis, Smiths and Myall Lakes and links catchment management actions to ecological improvements in the estuaries. It identifies priority actions for water quality improvement in rural and urban areas and outlines how pollution control systems and lake use activities can be improved to achieve additional benefits.

It is recognised that the plan will need to evolve to respond to biophysical, political and social uncertainties and a section of the plan is dedicated to adaptive management. To develop the WQIP urban and rural catchment models and an estuary response model were developed and integrated into a Decision Support System that was used to explore a range of management scenarios for inclusion in the WQIP. A number of research activities were also undertaken to inform the modelling and policy decisions in the WQIP these included mapping existing catchment management activities, land use mapping, cost benefit analysis of the actions and the exploration of an offset scheme for conservation associated with sustainable and appropriate development

BUDGET

ESR Budget	Grant Funds Received	GLC Other Funds	GLC In-kind Contribution	DECC In-kind Contribution	DECC Cash Expenditure	Total
$130,000	$2,090,000	$115,000	$131,516	$564,547	$31,134	$3,062,197

The Coastal Waters Unit in the Department of Environment and Climate Change (DECC) were key partners in the delivery of the Coastal Catchments Initiative and have therefore been included in this table.

PROJECT OUTCOMES / BENEFITS

The main outcome of this project is the WQIP with provides the strategic framework for water quality improvement. Through the Coastal Catchments Initiative a number of tools have been developed to assist with the implementation of the WQIP include the establishment of Development Control Plan for Water Sensitive Design (WSD), guidelines for Voluntary Planning Agreements with Developers, exploration of a water quality and development offset scheme, establishment of a decision support system to test future water quality management scenarios. Established a strategy for WSD to guide future urban area management and a Farm assessment tool to assist farmers with whole farm planning

FUTURE DIRECTION / NEXT STEPS

The next steps for the Coastal Catchments Initiative are to secure commitment from key stakeholders identified in the plan and to embed actions identified into the operations of each organisation. A water quality sub committee to the Great Lakes Catchment Committee has been established and tasked with this step. Securing funding to implement the WQIP is the fundamental step in implementing the WQIP. In this regard, the ESR is a critical element in the rational, effective and successful implementation of this significant and important program.

16.5 Structural Solutions for Water Quality

PROJECT JUSTIFICATION

Gross pollutants (litter, etc) as well as sediments and nutrients can cause significant water quality problems. To reduce these inputs, Council has constructed a number of structural solutions for water quality protection across the LGA, including litter baskets, gross pollutant traps and constructed wetlands. It is recognised that these facilities provide significant environmental services provisions for water quality treatment through filtering, polishing and pollutant uptake.

The effectiveness of these structures is dependant on their ongoing maintenance and the ESR funding has been used to both construct and deliver a regular maintenance regime to ensure continued sound water quality treatment across the Great Lakes urban landscapes.

Re-planting of a constructed wetland

PROJECT OBJECTIVES

The objectives of this project are to reduce the input of nutrients, sediments and gross pollutants to Wallis Lake by maintaining the effectiveness of existing water quality improvement structures through regular monitoring and maintenance of litter baskets, constructed wetlands and gross pollutant traps. As such, this is a fundamental and important action to ensure the protection of receiving waterbodies across the Great Lakes LGA.

PROJECT DESCRIPTION

Great Lakes Council has installed or acquired 252 litter baskets, 6 Gross Pollutants Traps (GPTs), 8 constructed wetlands and 3 Nicholas Ski jumps. One wetland, Bramble Parade, is currently being re-designed and to implement recommendations from the Great Lakes Water Quality Improvement Plan biofiltration trenches are currently being planned for the Pipers Bay catchment.

As part of this program, these structures are regularly monitored and maintained to ensure that they are operating effectively and efficiently. Litter baskets are typically cleaned out once every month and GPTs and wetlands are maintained on an as needs basis. Regular surveillance of wetlands is conducted and typical maintenance of wetlands involves ensuring plant communities are maintained including weeding, re-planting and the management of water levels.

With regards to reporting, the materials removed and the activities of maintenance and cleaning of all structural solutions that is carried out on a periodic basis is reported in the State of the Environment Report and used in educative efforts for the wider urban community. Monitoring and management of structural solutions is also conducted in an adaptive manner to ensure continued effective performance of these essential facilities.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$580,413	$122,264	Staff In-kind	$702,677

PROJECT OUTCOMES / BENEFITS

Each year structural solutions across the Great Lakes urban landscape prevent thousands of kilograms of pollutants from entering our lakes and receiving waterbodies. Such a result cannot be achieved unless these systems are functioning effectively. The ESR contributes to the monitoring and management of the installed structural solutions and the collation and publishing of monitoring data that provides an indication of the amount of pollutants being generated in the catchment and entering the stormwater systems. This data is used effectively in community education programs and in the evaluation of the future needs of the structural solutions program. The improvement of existing structures and the development of new structures will further improve the water quality and ecological condition of the local lakes and estuaries.

FUTURE DIRECTION / NEXT STEPS

Continued maintenance, cleaning and promotion of structural solutions are critical to long-term water quality outcomes across the Great Lakes LGA. There is a need to establish consistent reporting procedures for pollutant removal from the devices to assist with the interpretation of data in the State of the Environment Report. Ongoing implementation of the Healthy Lakes Program's stormwater education and awareness program is required to assist with reducing stormwater pollution generation in the catchment, the effective function of the installed structural solutions is essential as is the construction of new devices such as biofiltration trenches as recommended in the Great Lakes Water Quality Improvement Plan.

16.6 Great Lakes Catchment Committee and Rural Incentives Scheme

PROJECT JUSTIFICATION

The Wallis Lake Catchment Management Plan and Myall Lake Community Catchment Management Plan provide detailed pictures of the state of these two critical catchments.

Reporting on the issues that affect our catchments such as clearing, weed invasion and inappropriate soil, riparian and landscape management, the plans outline a range of actions to address this catchment degradation and reverse environmental decline.

To put these plans into action, GLC actively sought funding for the implementation of a Rural Incentives Scheme to engage and assist rural landholders to protect and restore natural systems.

Off-stream stock watering system installed to rehabilitate and protect the riparian zone

PROJECT OBJECTIVES

The objectives of this program are to:

- Oversee and supervise natural resource management in the catchment through the coordination of actions/ activities of both government and non-government organisations;
- Lead and support new visions such as agricultural diversity and carbon farming;
- Seek funding for catchment management works that provide both on-farm/ on-site and catchment wide benefits;
- Provide a conduit for community values and knowledge; and
- Act as an Advisory Committee for catchment implementation officers.

PROJECT DESCRIPTION

The Great Lakes Catchment Committee was established to guide the implementation of the relevant local Catchment Plans through the Catchment Coordinator. The Committee is formed by representatives of the local community, local and state government and Landcare and meets on a quarterly basis. The main focus of the committee is the supervision and direction of the on-ground implementation of land management works on private lands.

Great Lakes Councils' proven track record in Catchment Management and the implementation of rural incentive schemes have won the favour of the newly-established HCRCMA, with GLC being provided significant funds, partnership and technical support and advice to continue this work. This program involves landholders applying for funding, which they match with in-kind or financial contributions, to achieve natural resource management outcomes on their land that will ultimately assist in the protection and restoration of the quality of the wider catchments.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$145,550	$250,000	Staff In-kind	$395,550

PROJECT OUTCOMES / BENEFITS

This project has delivered significant, long-term environmental outcomes to the catchment. A total of eighty-eight (88) projects have been designed and facilitated and the following outcomes have been achieved:

- 457-ha of land permanently conserved within Registered Property Management Agreements;
- 113-km of stock exclusion fencing on riparian zones and 135-ha of wetlands and 56-ha of remnant native riparian vegetation protected;
- The provision of 169 off-stream watering points and 13.6-ha of actively eroding areas stabilised;
- The planting of 20,315 native trees and shrubs; and
- 364-ha of native bushland regenerated and protected.

FUTURE DIRECTION / NEXT STEPS

The Great Lakes Catchment Committee was formally created from the previous Wallis Lake Catchment Management Plan Implementation Committee in early 2009. The committee saw the need to broaden their scope and cover the entire LGA and its catchments under a single strategic committee. The future of the committee is to now oversee the extension of catchment management and to ensure that community engagement and on-ground works are implemented in a coordinated approach to secure the best possible outcome for our catchments and communities.

16.7 Rural Land Management Program

PROJECT JUSTIFICATION

Agricultural land accounts for a large proportion of land within the Great Lakes LGA. Accordingly, and as detailed in the Wallis and Myall Catchment Plans, the HCRCMA Catchment Action Plan and the GLC Water Quality Improvement Plan, agricultural practices have a major impact on the overall health of our environment.

Sustainable agriculture that maintains and improves the resource base of soil, water and biodiversity serves the best interests of individual landholders, the wider community and environment alike. This program links the need to maintain a viable local agricultural industry with the need to protect and enhance environmental values.

Wallamba Sustainable Farming Group inspecting a unique stock fencing system installed by one of the members

PROJECT OBJECTIVES

The project objectives are as follows:

- Facilitate a widespread understanding of farms as integrated living systems, and a holistic approach to rural land management;
- Promote networking, co-operation and information sharing between rural landholders;
- Promote land management practices which increase agricultural diversity, enhance biodiversity, eliminate soil erosion and reduce reliance on fertilisers and chemical inputs, thus reducing and reversing land degradation and water quality deterioration; and
- Promote land management practices which increase soil carbon sequestration.

PROJECT DESCRIPTION

Participatory Action Learning (PAL) is used as a proven adult learning strategy, giving participants' ownership of their learning experience and sustained outcomes of personal change.

PAL groups are established in sub-catchment areas to connect local landholders with each other and with facilitators. Landholders shape the agenda of group meetings within a framework designed to promote a holistic understanding of sustainable land management. PAL group learning is supplemented by professional workshops on key topics such as soil health, grazing management, carbon sequestration and biological agriculture etc. On-farm trials are subsidised to encourage the uptake of new practices. Demonstration sites promote good management practices. On-grounds projects are prioritised through Property Planning tools and funded through external bodies including HCRCMA, Wetland Care and Caring for our Country.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$400,722	$20,000	$400,722

PROJECT OUTCOMES / BENEFITS

Participants of the Rural Land Management Program have gone on to implement on-farm projects including weed management, revegetation, waterway protection, off stream stock watering facilities and improved grazing management infrastructure. They have also tried new practices in soil and pasture improvement, contributing to local knowledge.

The Rural Land Management Program facilitates the implementation of the rural land recommendations of the Water Quality Improvement Plan by individual land managers, through community driven engagement promoting groundcover management, nutrient management and protection of waterways. As such, it achieves key and strategic on-ground environmental, economic and social improvements.

FUTURE DIRECTION / NEXT STEPS

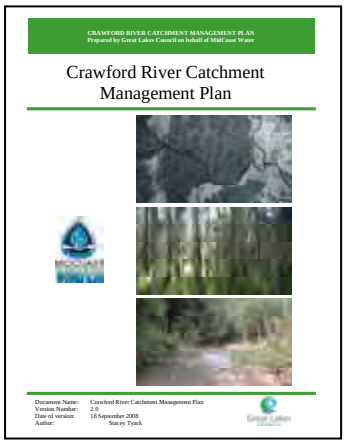
The participatory education framework has been well received, and it is planned to expand the group learning process to support local groups in all sub catchment areas across the Great Lakes. We will continue to promote best practice grazing management, as grazing remains the largest land use. We are also pursuing a vision of diversification of agriculture in the Great Lakes, to ultimately support a diverse and sustainable local food economy in a healthy environment.

16.8 Crawford Catchment Management Plan

PROJECT JUSTIFICATION

The Crawford River Catchment, lying to the west of Bulahdelah, is the water supply catchment for the town. Water quality monitoring that has been conducted in the catchment has revealed low pH and high levels of sediment, metals, nutrients and faecal coliforms. As with many NSW rivers, Diffuse Source Water Pollution accounted for the majority of pollutant loads in the Crawford River.

A whole of catchment approach was required to tackle such a diverse diffuse source of pollutant loads. The development of a Catchment Management Plan was required to detail recommendations for holistic management of water quality issues and provide the framework for a 'catchment to tap' approach.



The Crawford River Catchment Management Plan

PROJECT OBJECTIVES

The project adopted the following objectives:

- Investigate a broad range of information and modelling to provide understanding of the current state of the catchment including land tenure, vegetation and soil types, land capability and vulnerability, potential pollution sources, local and regional vegetation corridors and threatened species;
- Involve all stakeholders including government agencies such as Forests NSW , DECC (NPWS), MidCoast Water, private landholders, industries and the community of Bulahdelah; and
- Develop the framework for a pilot program for whole of catchment methods to improve water quality.

PROJECT DESCRIPTION

GLCs previous experience with holistic catchment management and community engagement was employed to produce a plan which was informed by a broad collation of physical and historical information and extensive community engagement.

The plan placed a high priority on stakeholder engagement, recognising that recommendations are more likely to be implemented in a sustainable manner if landholders and agencies on the ground are involved in the planning process. Stakeholder engagement included mail outs, private landholder surveys, workshops and field days, the establishment of a Sustainable Grazing Group to provide training and skills sharing for producers, landholder site visits and on-ground project development. Additional studies during the preparation of the plan included a gravel roads audit, riparian assessment, water quality monitoring and modelling of catchment processes.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$106,800	Staff In-kind	$106,800

PROJECT OUTCOMES / BENEFITS

The development of the Crawford River Catchment Management Plan has synthesised a diverse range of inputs and values and the current state of the catchment:

- To identify priorities for immediate on-ground works;
- To identify future investigations to guide long term management;
- To established an on-going community support and on-ground works program;
- Provide for the establishment of a new and very active Landcare group; and
- Forged partnership between government agencies, Landcare and the local community.

FUTURE DIRECTION / NEXT STEPS

It is emphasised that the Crawford River Catchment Management Plan is to be used as an adaptable tool which should respond to forthcoming information and on-ground experience which will continue to emerge as its recommendations are implemented. Support for both individual landholders and the Crawford Landcare Group will be continued.

Importantly this support should include access to field days and professional workshops as well as technical expertise to design property plans and on-ground projects.

16.9 Karuah Catchment Management

PROJECT JUSTIFICATION

The Karuah River Catchment is a large catchment within the Great Lakes LGA. However, it has received limited attention in past years, whilst work has focused on the Wallis Lake and Myall Lakes Catchments. The Karuah River and catchment feeds into the Port Stephens Estuary which is managed by Port Stephens Council and is a gazetted Marine Park.

To manage water quality in the Port Stephens Estuary, a collaborative approach between the two councils is required. In addition, the HCRCMA Catchment Action Plan, outlines the Karuah Catchment as a priority area for the protection and regeneration of native vegetation, controlling and treatment weeds and the protection and enhancement of wetlands.

Native riparian regeneration on Branch Creek after stock exclusion

PROJECT OBJECTIVES

The extension of community support into the Karuah Catchment is still in its infancy and has focused on two small trial areas.

The objectives of Great Lakes Council in partnership with the Hunter Central Rivers Catchment Management Authority (CMA) and Karuah Great Lakes Landcare are to:

- increase community skills, knowledge and engagement across the Karuah catchment,
- undertake on-ground works which have both on farm scale and catchment wide benefits, and
- Establish a partnership for catchment management including the Karuah community, Landcare and local and state government agencies.

PROJECT DESCRIPTION

The project is facilitated through a combination of landholder field days, professional workshops on key topics such as strategic grazing and soil health, organisation of technical assistance, distribution of general information to rural landholders and individual farm visits. Individual farm visits allow in-depth one on one discussion with landholders, assistance with property planning and assistance with grant applications for the implementation of on-ground works. These discussions focus on both farm scales as well as catchment wide land management issues including clearing, weed invasion, soil, riparian and landscape management. From this on-ground projects are designed and funded through external grants including HCRCMA and WetlandCare Australia.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$90,000	Staff In-kind	$90,000

PROJECT OUTCOMES / BENEFITS

Seed workshops and on-ground projects have generated significant interest within the Karuah Catchment community, providing a strong indication that continued work in this area will realise great benefit both in terms of community skills, knowledge and engagement and the interest and capacity of landholders to undertake on-ground works.

On-ground works have benefits both on and off the farm, improving catchment health and the health of Port Stephens Estuary. The promotion and establishment of sustainable agricultural practices will have long-term economic, social and environmental benefits and the implementation of ongoing working partnerships between stakeholders will assist in proactive catchment management.

FUTURE DIRECTION / NEXT STEPS

The future direction and next steps of this project include the following:

- Committed officer (or part there of) for the Karuah catchment landholders;
- Regular local field days and professional workshops targeting farming practices and environmental management in the Karuah catchment; and
- Promotion of upcoming rounds of incentive funding for on-ground works.

16.10 Fish Passage Barriers Project

PROJECT JUSTIFICATION

River connectivity and fish passage has been disrupted in the Wallamba and Coolongolook Rivers (of the Wallis Lake Catchment) through the installation of road crossings. These crossings impact native fish populations by interrupting spawning and seasonal migrations, restricting access to habitat and food resources and altering habitat condition and water quality.

Both Locketts Crossing (Coolongolook River) and Clarksons Crossing (Wallamba River) have been listed as high priority crossings for removal by the Department of Primary Industries, by the Wallis Lake Catchment Management Plan and the HCRCMA 'Reducing the Impact of Road Crossings on Aquatic Habitats in Coastal Waterways'.

The derelict causeway on the Wallamba River at Clarksons Crossing

PROJECT OBJECTIVES

The objectives of this project are to:

- Restore fish passage and connectivity through removing fish barriers or the installation of fish-ways that allow fish to pass barriers and improve fish habitat;
- Remove derelict, unsafe historical road structures; and
- Engage the local community and improve their knowledge and understanding of native fish movement and passage barriers

PROJECT DESCRIPTION

State and Local Government agencies including Great Lakes Council, Greater Taree City Council, the Hunter Central Rivers Catchment Management Authority, the NSW Department of Primary Industries (Fisheries) and MidCoast Water are working collaboratively to address the social and environmental issues associated with these fish barriers.

Extensive research and data collation is undertaken to determine feasible management options, as well as directing the community consultation process. The removal of the barrier of the installation of an appropriate fish-way is then subject to an appropriate environmental assessment, including technical evaluation leading to relevant project consideration and approval. All such studies and assessments are undertaken with appropriate input and expertise as well as reference to the relevant strategies and plans.

BUDGET

ESR Budget	GLC Other Funds	Grant Funds Received	In-kind Contribution	Total
$0	$10,000	$44,563	Staff In-kind	$54,563

PROJECT OUTCOMES / BENEFITS

Implementation of these projects will aid the restoration of native fish passage, reduce the public safety risk and lead to improved water quality within the Wallamba and Coolongolook Rivers, through the reinstatement of natural flows and river function.

It is expected that the extent of algae infestation and fish kill events (namely at Clarksons Crossing) will lessen and the general aesthetics of these segments of river will be restored. This project will increase the community's awareness of the impacts imposed by barriers such as weirs, road crossings and floodgates on river environments through ongoing extensive consultation, media and project information dissemination.

FUTURE DIRECTION / NEXT STEPS

The future direction of these programs is set-out below:

With regards to Locketts Crossing, all research and data collation is complete, a design has been completed and funding has been sourced. The installation of a fish ladder is being undertaken in March-June 2009. For Clarksons Crossing, the future works shall include surveys (cross sections and a longitudinal profile), salt intrusion modelling, legal advice in relation to removal of the structure, continued community consultation, a Review of Environmental Factors and finally the construction and implementation of the most feasible option to enhance fish passage at this location.

16.11 Waterwatch Program

PROJECT JUSTIFICATION

Waterwatch is a nationwide water quality monitoring program aimed at educating and empowering schools and communities on water quality issues in local areas.

Great Lakes Council adopted the facilitation of this project in 2004 and it is funded through the ESR. Council's support for Waterwatch is a component of the Healthy Lakes Program to protect and enhance water quality in the local rivers, creeks and estuaries.

In order to properly manage water quality, the acquisition and recording of water quality trends is of critical importance. Waterwatch contributes knowledge about the state of the area's water systems. It is also very useful as an educative tool for students and the community on water quality issues, trends, risks and threats and current state.

Stormwater Scamper participants learning about Waterwatch

PROJECT OBJECTIVES

Waterwatch aims to:

- Create awareness of water quality issues by involving all members of the community
- Form partnerships between the Waterwatch group and water authorities, local councils, businesses and industry;
- Record and collate information on water quality parameters through routine testing; and
- Inform Council and other relevant stakeholders to provide for and develop water quality management systems within urban catchments.

As such, the Waterwatch program is a very important component of the wider Healthy Lakes Program.

PROJECT DESCRIPTION

The Great Lakes Council facilitated Waterwatch program is delivered through the Healthy Lakes Program.

The project titled 'Reducing Stormwater Pollution at the Source' utilised the Waterwatch program as one of the main engagement methods to inform the community about stormwater pollution. There are a number of groups that regularly collect water quality data across the Great Lakes Region which forms a part of a larger online database to show water quality trends.

Council and MidCoast Water provide Waterwatch kits and assist water sampling and analysis as well as providing an educative tool for community, school groups and school excursions to involve them in participatory action learning on local environmental issues.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

The Waterwatch program hosts an online database on the website where volunteer groups enter their water quality data. This provides ongoing benefits in the detection of changes in water quality at the sites monitored. Community members that have been involved in the program have gone on to assist council officers in the delivery of further Waterwatch education to school groups.

The Waterwatch program has also greatly assisted in informing and educating the local community and local schools on risks and threats to water quality, the current state of the local creeks, rivers and estuaries and tools and measures that are important to protect and manage water quality in the future.

FUTURE DIRECTION / NEXT STEPS

The Waterwatch program is a very useful and versatile tool that can be adapted to align with any form of catchment education. The continued use of Waterwatch in the community and schools is highly beneficial in delivering environmental education. It is to be continued in this format in recognition of its benefits to data gathering and community education and empowerment.

16.12 Darawakh Wetland Restoration Project

PROJECT JUSTIFICATION

The Darawakh Creek/ Frogalla Swamp wetland is a 910-hectare coastal floodplain wetland that has been extensively modified by the combined effects of artificial drainage (22-km of drain has been established across the landscape), clearing and grazing as well as weed invasion and the effects of exotic fauna. The wetland itself is underlain by acid sulfate soil landscapes. During the 1990's, the artificial drainage network was found to have created conditions leading to the oxidation, generation and transport of severe acid sulfate discharges, including heavy metal contamination, across the wetland and to the Wallamba River. This discharge was described as being equivalent to a toxic waste dump. Council in 2002, with supporting agencies, embarked on a program to remediate the acid sulfate generation and discharge to improve the land and protect the Wallamba River, as well as restore and conserve the land.

Naturally regenerating in-filled drain in the Darawakh Creek/ Frogalla Swamp wetland

PROJECT OBJECTIVES

The over-riding objectives of this project are to:

- Progress the restoration of the wetland project area from its current condition towards a state that resembles its condition prior to broadscale clearing and draining works across the land;
- Remediate the landscape so that the natural potential acid sulfate soils that occur within it are returned, as far as is possible, to a stable, non-oxidising, non-reactive and immobilised state;
- To manage, as far as possible, processes within the landscape to restore functioning, self-sustaining, intact and resilient natural ecological communities to the land; and
- To protect the land from new and further disturbances and harm and conserve the land as a nature reserve.

PROJECT DESCRIPTION

The actions associated with this project were formulated by a Scoping Study (prepared in 1999) and a Management Plan (2002), which clearly identified that to meet the project objectives, the wetland project area needed to be publicly acquired, threatening processes and actions needed to be removed (grazing, etc), drains and levees needed to be removed to restore pre-disturbance hydrology and natural vegetation communities needed to be reinstated and restored on the land. Implementation of such actions commenced in 2003 and has been ongoing to the present time. These actions are expected to deliver a reduction in acid sulfate outflows from the wetland project area of between 60 and 80%, thus preserving and enhancing the quality and productivity of the lower Wallamba River. Substantial progress has been made with respect to the project, with significant achievements in relation to land acquisition, drain infilling and levee removal, weed control and management and facilitated natural regeneration of vegetation communities. A Memorandum of Understanding has been signed between Great Lakes Council and DECC to effect the transfer of the restored land to the public conservation estate.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$1,121,717	$3,109,205	Staff In-kind	$4,230,922

PROJECT OUTCOMES / BENEFITS

To date, this project has delivered:

- Acquisitions of all but two (2) outstanding holdings, of 63-hectares total that occur, within the critical wetland project area. Over 994-ha of land (both within the project area and on adjoining land has been acquired by Great Lakes Council and its partnering agencies (MidCoast Water and DECC) to date;
- 14.7-km of artificial drains and their adjoining levee bank have been removed or otherwise de-commissioned (66.5% of the total drain network) restoring natural hydrology to over 600-ha of the wetland
- Water quality monitoring has been enacted that demonstrate that significant acid sources are being stemmed;
- Significant areas of weed control have been undertaken using contract bushland regenerators and large areas of the wetland project area are being subject to supervised natural regeneration; and
- A Restoration Management Plan has been prepared to guide the land's further restoration and conservation.

FUTURE DIRECTION / NEXT STEPS

The project has yielded significant positive outcomes since its commencement and would not have been possible without the ESR funds, which have been directly applied and used to lever significant external funds. There remains more of the restorative works to complete to achieve the project outcomes, including finalising the acquisitions, restoring the pre-disturbance hydrology and continuing bushland regeneration and weed control works prior to the conservation of the land as part of an extension to Darawank Nature Reserve.

16.13 Wallamba River Erosion Control

PROJECT JUSTIFICATION

The Wallamba River is an important natural resource of the mid north coast of New South Wales. It is a vital link in the social, economic and ecological character of Wallis Lake and surrounds. As a result of the oyster crisis in 1997 Great Lakes Council has actively promoted the sustainable use of Wallis Lake and its tributaries to ensure improved water quality that enable the key industries of tourism, oyster growing, commercial and recreational fishing to continue. The Wallamba River is the major tributary of Wallis Lake and contains a significant portion of the oyster leases within Wallis Lake. Poor water quality has resulted in lost production form 63-hectares of oyster leases. The health of the Wallamba River has suffered from past removal of riverbank vegetation, stock grazing and significant impact from boat wash. Bank erosion has resulted in deterioration of water quality, loss of seagrass and impacts on private property.

Bank Erosion on the lower Wallamba River

PROJECT OBJECTIVES

The Wallamba Riverbank Erosion Management project aims to:

- Improve the sustainable management of the river by addressing bank erosion through tackling the impacts of boat wash, cattle access and vegetation loss;
- Improve water quality in the lower Wallamba;
- Engage all key stakeholders in identifying and negotiating solutions to the sustainable use of the river; and
- Work in partnership with landholders and agencies to implement riverbank management solutions.

The Wallamba River Memorandum of Understanding (MOU) developed as the central component of this project seeks to ensure that boating procedures and practices maximise user safety, responsibility and enjoyment; protect the recreational and environmental values of the waterway; and provide a consistent approach to existing and anticipated future issues.

PROJECT DESCRIPTION

Following from the Wallis Lake Catchment Management Plan and Wallis Lake Estuary Management Plan, a Rivercare Plan was prepared for the Lower Wallamba River to tackle the key community and industry concerns regarding water quality and sustainability issues associated with use of the river. The Rivercare plan identified, through stakeholder engagement, priority recommendations for improving the management of the riverbank. Key aspects of this Rivercare plan were addressed by way of an innovative engagement and negotiation process involving key stakeholder groups with an interest in the sustainable use of the Wallamba River. The MOU provided an agreed framework for the sustainable use and management of the river benefiting waterway users, riverbank landholders and the environment. As such a partnership approach to environmental management has been implemented by Great Lakes Council, providing landholders with funding to repair and rehabilitate the riverbank. The Wallamba MOU, through agreement, restricted water skiing to a 9-km zone. Council, landholders and funding partners are investing in bank protection within this zone. Investment includes rock revetment, rock fillets, mangrove establishment, fencing and regeneration.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$125,000	$370,864	Staff In-kind	$495,864

PROJECT OUTCOMES / BENEFITS

The project has delivered the following outcomes and benefits

- Agreement with user groups, landholders, caravan parks and agencies on the River's sustainable use;
- Rehabilitation of 3-kilometres of riverbank through installation of rock fillets, fencing and regeneration;
- Relocation of Manns Road from the riverbank to facilitate a safer access and revegetation of the riverbank;
- A plan for investing in bank protection work over the 9-kilometre ski zone;
- A model for addressing conflict over the recreation use of natural resources and environmental degradation;
- Sensitive resolution of a longstanding conflict; and
- Improvements in water quality through reduction in bank erosion, sedimentation and turbidity.

FUTURE DIRECTION / NEXT STEPS

Future project funds are required to continue the implementation of the Wallamba Memorandum of Understanding and the Lower Wallamba Rivercare Plan. Implementation projects include installation of rock fillets to promote the establishment of mangroves and fencing to exclude stock from the riverbank to promote re-establishment of a functional riparian zone. The key focus is to invest in bank protection within the 9-kilometre MOU ski zone. Designs are currently being prepared for most of the eroded bank within this zone. Landholders adjacent to the river continue to be engaged to assist in rehabilitation of the riverbank.

16.14 Smiths Lake Estuary Management Plan Implementation

PROJECT JUSTIFICATION

The Smiths Lake Estuary Management Plan (SLEMP) was adopted by Council in May 2001. An Estuary Management Committee was formed comprising key stakeholders and community representatives to guide the documents development and implementation. Initially the committee worked towards addressing erosion issues, a major contributor to nutrient inputs and sedimentation within the lake. Over recent years (2005 to 2009) the focus of this committee has shifted to address major development controls for water quality improvement, flooding issues, 4WD impacts and community education. The ESR is used directly to facilitate documented actions and outcomes required by the adopted Estuary Management Plan and administer the Committee, whilst indirectly the ESR employs, Council environmental staff with key responsibilities in administering and delivering outcomes of the plan.

The Smiths Lake Estuary

PROJECT OBJECTIVES

Several objectives were identified within the Smiths Lake Estuary Management Plan to guide its implementation. These are to:

- Protect and conserve the estuarine habitat and ecosystem;
- Protect recreational, commercial, cultural and aesthetic values;
- Initiate repair of past damage and prevent future degradation;
- Achieve ecologically sustainable use of estuarine resources;
- Harness community input to facilitate lake management by increasing community awareness, support and involvement; and
- Balance development expectations with other lake management objectives.

PROJECT DESCRIPTION

Revenue generated through the ESR has been used to secure substantial income through the Coast and Estuaries Fund for the implementation of several projects which contribute to the protection of water quality within the Smiths Lake Catchment. These projects include the following:

- Facilitation of the Smiths Lake Estuary Management Committee;
- Overseeing the development of the Smiths Lake Flood Study;
- Maintenance of gross pollutant traps installed during the 2001/04 period;
- Installation of signage restricting 4WD access to the northern end of Cellito Beach;
- General education and awareness (refer to report s3.29 of this report);
- The sealing of Tarbuck Bay Road to reduce erosion and runoff entering the lake; and
- Providing input on major developments in terms of water quality improvement.

BUDGET

ESR Expenditure	Grant Expenditure	In-kind Contribution	Total
$79,533	$58,000	Staff In-kind	$137,533

PROJECT OUTCOMES / BENEFITS

Management of the Smiths Lake Catchment through the Estuary committee has delivered several benefits. These include:

- The establishment of protocols for new residential areas that are sensitive to and protect local water quality;
- Reduced erosion hence sediment and nutrient loads entering Smiths Lake;
- A functioning and effective committee comprising key industry and community representatives;
- Access to resources through the Coast and Estuaries Program Fund, which are matched by ESR contributions; and
- Managed 4WD access and reduced impacts on dunal systems.

Thus, the Smiths Lake Estuary Management Plan implementation has greatly benefited the Smiths Lake environment.

FUTURE DIRECTION / NEXT STEPS

The Smiths Lake Estuary Management Committee will combine with the Wallis Lake Estuary Management Committee to integrate the achievements of these forums with broader strategic planning and regional outcomes through the newly established Coast and Estuaries Committee. This group will be responsible for reviewing the existing SLEMP and addressing ongoing issues within the Smiths Lake Catchment area among other water quality improvement projects.

16.15 Port Stephens Estuary Management Plan Implementation

PROJECT JUSTIFICATION

The Port Stephens/ Myall Lakes Estuary Management Plan was developed in 2000 through the joint Port Stephens Great Lakes Council Estuary Management Committee. Implementation has focussed on several priority projects including; development of the Port Stephens Foreshore Management Plan, development and implementation of the Myall catchment Plan and Water Quality Improvement Plan, implementation of the Tea Gardens/ Hawks Nest and Bulahdelah Stormwater Management Plan and efforts to secure commercial interests to progress the maintenance dredging of Corrie Channel. Significant on-ground implementation work is now occurring in the Myall Lake catchment to improve the quality of water received in the Myall Lakes (refer to Crawford catchment plan and Sustainable rural land management program case studies). More recently a funding opportunity provided by the State Government has served as a catalyst for advancing the dredging of the Corrie Island navigation channel.

North Arm Cove Foreshore

PROJECT OBJECTIVES

The project aims to progressively implement the recommendations of the Port Stephens Myall Lakes Estuary Management Plan to ensure the sustainable management of the waterways.

The plan is intended to guide the use and development of the estuary and its surroundings, so that the environment and lifestyle that are highly valued by the local community are protected and enhanced. A key priority has been the development of the Port Stephens Foreshore Management Plan. This plan provides a recipe for co-ordinated management of the entire foreshore.

PROJECT DESCRIPTION

ESR funds have contributed to:

- The development of the Port Stephens Foreshore Management Plan;
- The development of the Myall Lakes Water Quality Improvement Plan (part of the Great Lakes WQIP);
- Staff labour to progress the development and implementation of sustainable rural land management initiatives with landholders in the Myall and Karuah catchments;
- Staff labour to ensure water quality objectives are achieved for all new major developments and land rezonings in the waterway catchment; and
- Staff labour to progress priorities of the estuary management plan including sourcing funding for maintenance dredging of Corrie Channel.

BUDGET

ESR Expenditure	Grant Expenditure	In-kind Contribution	Total
$25,000	Port Stephens Council estuary grant	Staff in kind	$25,000

PROJECT OUTCOMES / BENEFITS

A collaborative approach to management of the Port Stephens/ Myall Lakes estuary has been developed with Port Stephens Council and other supporting agencies. This approach delivers co-ordinated management of this important natural resource. The collaborative approach was used to develop the foreshore management plan. This plan provides a blueprint for management of the foreshore by the two councils and other land managers. The project has delivered:

- A plan to improve water quality of the Myall Lakes backed by rigorous scientific assessment;
- On-ground implementation by working with rural landholders; and
- Ensuring new development meets water quality objectives.

FUTURE DIRECTION / NEXT STEPS

There is significant community expectation to implement the Great Lakes Water Quality Improvement Plan (Myall Lakes section). Efforts will need to be ongoing to ensure the long term improvement in catchment water runoff from the Myall and Karuah catchments. This can only be achieved by continuing to implement and progress innovative rural landholder engagement programs. Future projects will need to undertake maintenance dredging requirements to maintain access for the considerable commercial and recreational traffic accessing the Myall River and Port Stephens. Council is enthusiastic about focussing the community support for maintenance dredging by securing local funding through a small rise in the environmental rate which would allow Council to secure state government funds through the 50/50 funding model for maintenance dredging. Council is also working to complete the Pindimar Foreshore erosion study and plan following the completion of the overall Foreshore Plan.

16.16 Wallis Lake Estuary Management Plan Implementation

PROJECT JUSTIFICATION

Great Lakes Council facilitates and administers the Wallis Lake Estuary Management Committee and supervises the implementation of the Wallis Lake Estuary Management Plan (2005). Estuary management planning and the arrangement and function of estuary management committees is a very important and effective tool for bringing the full range of stakeholders together for the effective management, protection and restoration of estuarine systems, for preparing and documenting estuary management plans and action tables and for accessing external funding support for estuary management (such as NSW estuary funds). The ESR is used directly to facilitate documented actions and outcomes required by the adopted Estuary Management Plan and administer the Committee, whilst indirectly the ESR employs, Council environmental staff with key responsibilities in administering and delivering outcomes of the plan.

The Wallis Lake estuary

PROJECT OBJECTIVES

The objectives of the Wallis Lake Estuary Management Plan are set out on the EMP and reproduced herein. The Wallis Lake Estuary Management Plan aims to provide a strategic framework within which management measures can operate effectively to:

- Conserve, protect and enhance areas of significant cultural, ecological and aesthetic value
- Restore or remediate degraded areas
- Balance the recreational, commercial, social and cultural needs of the estuary
- Increase the economic value of the estuary in an ecologically sustainable manner, and
- Increase community awareness of estuarine processes and management issues.

PROJECT DESCRIPTION

The Wallis Lake estuary Management Plan was prepared and adopted in 2005. It sets out 149 specific actions to be implemented to meet the program's objectives which are grouped across eight (8) major themes of water quality and flow, ecology, fisheries, oyster aquaculture, sedimentation, foreshore management, waterway usage and community education. Some of the more major, specific projects of the Wallis Lake Estuary Management Plan have been reported elsewhere in this ESR report. The Plan documents implementation, costing and funding and attributes priorities. The plan was based on both scientific knowledge and research of the Wallis Lake system as well as significant contribution from stakeholders and the community. The Estuary Management Plan probably requires updating and amendment following the documentation of the Wallis Lake Water Quality Improvement Plan (2009), which has substantially added to knowledge of the issues and management responses to protect, preserve and restore the condition and function of the Wallis Lake Estuary. The current Estuary Management Committee is formed of representatives of stakeholders from government agencies and the community. The Committee is currently undergoing review.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
Various projects	$25,000	Staff In-kind	$25,000

PROJECT OUTCOMES / BENEFITS

To date, of the 149 listed actions, the following progress has been achieved to date:

- Fully commenced actions: 10 (6.7%)
- Ongoing actions: 45 (30.2%)
- Partially commenced actions: 37 (24.8%)
- Not commenced: 57 (38.3%)

As such, there has been considerable progress made with respect to the implementation of actions set-out in the plan. These have delivered major improvements to the condition, integrity and quality of management of the Wallis Lake environment. The ESR is of critical benefit to the continued implementation of the Wallis Lake Estuary Management Plan.

FUTURE DIRECTION / NEXT STEPS

The ESR, both with respect to direct funds and the officers it employs, is critical to the continued implementation, administration and review of the Wallis Lake Estuary Management Plan to build on key project successes, to commence actions that are yet to be instigated and to provide for major review and integration of relevant documents scheduled for 2010. The Estuary Management Committee is proposed to be amalgamated with the Smiths Lake Estuary Management Committee and is to be expanded to include coastal zone management planning as well during 2009.

16.17 Wallis Lake Wetland Strategy

PROJECT JUSTIFICATION

Wetlands are habitats of critical environmental, social and economic importance. They provide key environmental services functions, including the protection of water quality in rivers, estuaries and lakes, they provide fish and crab breeding grounds and provide habitat for significant biodiversity, including threatened species. The Wallis Lake Catchment Management Plan and the Wallis Lake Estuary Management Plan have identified the need to develop and implement a wetland strategy for Wallis Lake and the recently adopted Water Quality Improvement Plan recognises the critical importance of wetlands in protecting and enhancing water quality. The strategy seeks to document a set of guiding principles for wetlands, identify the specific wetlands of the Wallis Lake catchment and set-out actions for their appropriate and specific protection, management and, where required, their restoration.

Reed-bed fringed with swamp oak swamp sclerophyll forest- Darawakh Creek/ Frogalla Swamp wetland

PROJECT OBJECTIVES

The Wallis Lake Wetland Strategy seeks to:

- Establish a set of guiding principles for wetland protection and management in the Wallis Lake catchment
- Identify, map and describe all of the individual wetland systems of the Wallis Lake catchment
- Recognise and promote the value and importance of the wetlands of Wallis Lake
- Develop and document actions, strategies and implementation schedules to achieve relevant, effective and appropriate management, protection and restoration of key wetland systems
- Provide for the monitoring and adaptive management of the wetlands of Wallis Lake
- Derive a model that can be deployed for wetland systems elsewhere across the Great Lakes LGA

PROJECT DESCRIPTION

In order to properly manage wetland systems, there needs to be an understanding of the nature, function and condition of those systems. The first stage of this project has comprised a wetland vegetation classification project undertaken by Dr Stephen Griffith (a recognised wetland vegetation expert). The second stage has involved the identification of wetland project areas across the Wallis Lake catchment and twelve (12) such project areas have been identified. Specific and individual strategies are being documented for each area. These individual strategies follow a standardised template that includes a description of the wetlands, discussion of the values and attributes of those wetlands, documentation of existing management actions and a detailed wetland management strategy, implementation schedule and action plan, describing vision and objectives, actions, responsibilities, costing as well as monitoring, evaluation and review. All the specific area strategies follow an introductory/ guiding document, which has been prepared in draft. There has been a commencement of on-ground implementation of the draft strategy in the Minimbah area through the acquisition of a number of key wetland holdings and gazettal of such as Minimbah Nature Reserve.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$1,345,000	Staff In-kind	$1,345,000

PROJECT OUTCOMES / BENEFITS

The Strategy is in progress. The Stage 1 vegetation classification works have been completed and have identified that wetlands of Wallis Lake contain a diverse assemblage of significant native vegetation communities and are important landscapes in the environmental, social and economic context. The introduction/ guiding strategy has been prepared for public exhibition. It outlines seventeen (17) guiding principles and twelve (12) guiding actions to direct the appropriate management of the wetlands of Wallis Lake. The development of individual strategies for wetland project areas is defining the protection and, where required, restoration activities to manage wetlands in a sustainable, effective and appropriate manner for the benefit of the environment and the local community. Four (4) wetland area strategies are well advanced, including strategies for the Darawakh/ Frogalla wetland, estuarine island wetlands, Wallamba floodplain and North Tuncurry. On-ground implementation has commenced in the Minimbah Wetlands.

FUTURE DIRECTION / NEXT STEPS

This project now requires the finalisation of the Introductory/ Guiding Document and the completion of the 12 individual wetland project area strategies across the Wallis Lake catchment. Following the adoption of the completed strategies, there is a need for significant action to implement the identified actions within the strategies, including actions for conservation, restoration, education, monitoring and adaptive management. Following the completion of the wetland strategy for Wallis Lake, the model used shall be deployed to develop wetland management strategies and action plans for wetlands elsewhere in the Great Lakes LGA.

16.18 Vegetation Strategy

PROJECT JUSTIFICATION

Local Government is a primary land management agency and has responsibilities in planning and managing the natural environment. Council has recognised that vegetation management is a significant component in the attainment of sound outcomes for the management of biodiversity, catchment/ water quality, ESD and development assessment and strategic planning. Consequently, it is developing a Vegetation Strategy. There are two main components of the strategy, namely the mapping and description of vegetation communities of the LGA and the development of a framework for conservation, management and restoration, where required, of native vegetation. As such, the strategy seeks to document a vision and objectives for native vegetation management and guide Council decision-making to appropriately conserve, protect and restore native vegetation in recognition of its benefits and values.

Dry Sclerophyll Forest and Woodland - Bulahdelah

PROJECT OBJECTIVES

The Great Lakes Vegetation Strategy seeks to:

- Describe and map the current vegetation communities of the Great Lakes LGA
- Describe the current distribution and status of vegetation communities of the Great Lakes LGA
- Ascribe each of the mapped vegetation communities of the Great Lakes LGA a conservation significance in relation to its Commonwealth, State, regional or local values/ significance
- Identify the major threats affecting the vegetation of the Great Lakes LGA
- Document a series of recommendations grouped around major themes to appropriately and effectively manage, protect and where required, restore functional native vegetation communities in the LGA

PROJECT DESCRIPTION

Prior to 2001, Council supervised and administered the investigation and subsequent description and mapping of vegetation communities within the eastern portion of the LGA through the use of contract botanists and GIS support personnel. This project was partly funded through NHT funding and matching Council contributions. During the period to 2004, effort was directed to the compilation of the strategy document, including information on the conservation status of vegetation communities, key threats to native vegetation and its integrity as well as the documentation of an action plan to provide the framework for a holistic and proactive vegetation management strategy. In 2005, a Draft Strategy was approved for public exhibition, but this was delayed by the reforms to native vegetation and threatened species legislation and management in NSW at that time. Further, Council has been recently working with the Hunter Councils Environment Division with respect to regional vegetation mapping. Since 2005, there has been fine-scale refinement and upgrading of the vegetation mapping in key, priority areas. Information collated as part of this Strategy is used to satisfy Council's statutory responsibilities and effectively contribute to development assessment and strategic planning.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

In 2005, a Draft Vegetation Strategy was prepared for the eastern portion of the LGA, which included description and mapping of the vegetation community types over 200,000ha of land and reported on issues such as conservation status and key threats to vegetation. It also included a range of actions pertaining to the implementation of measures to rationally and effectively manage, protect and restore vegetation, including corridors, key habitats and significant communities. Such measures included commentary on the use of planning instruments and processes, establishment of decision-making frameworks, monitoring of vegetation change and promotion of community education and awareness. Since that time, the strategy has been used generally in decision making, but at the same time, is being updated to reflect amended State legislation relating to native vegetation and threatened species, is being revised and updated in key project areas and has been considered within a regional context through a partnership with HCED.

FUTURE DIRECTION / NEXT STEPS

The Vegetation Strategy document shall be revised, updated and exhibited to form a vision, guiding principles and guiding actions for Council's decision-making pertaining to native vegetation. The mapping will also be continually revised and updated, with specific priority localities (Hawks Nest/ Tea Gardens) or priority community mapping (wetlands, coastal floodplains, rainforests). There will be a need to continue the collaboration with HCED for Council's local mapping to inform the regional vegetation mapping products and decision-making and for Council's strategy to recognise and adopt the regional priorities and recommendations.

16.19 Biodiversity Conservation Framework

PROJECT JUSTIFICATION

The Great Lakes LGA is a highly biologically diverse region. Biodiversity conservation and management is critically important because it is recognised that the quality of life of present and future generations depends on conserving and restoring biological diversity and using natural resources sustainably. This is because biodiversity underpins the processes that make life possible – healthy ecosystems necessary for maintaining and regulating conditions on earth. For instance, biodiversity provides key environmental services functions associated with water quality protection, oxygen production, carbon capture, nutrient cycling, etc. Biodiversity also contributes to our way of life by providing areas of recreation, green-belts, amenity and culture. Further, it underpins the local economy through primary production (fishing, oyster-farming, timber production, grazing). Integrated biodiversity conservation is thus very important.

Eastern Grey Kangaroos in Coastal Saltmarsh at Coomba Park

PROJECT OBJECTIVES

It is recognised that a system for achieving effective biodiversity conservation and management within Council decision-making is critically important. The Biodiversity Conservation Framework/ Strategy seeks to document a Biodiversity Strategy that:

- Establishes a set of guiding principles for biodiversity conservation and management in the Great Lakes LGA
- Defines the existing biodiversity of the LGA and recognises the values and importance of biodiversity
- Documents a vision, objectives, guiding principles and guiding actions for biodiversity conservation
- Leads to the preparation and implementation of on-ground actions to conserve and restore biodiversity, including priority areas, corridors, education and awareness and adaptive monitoring and feedback

PROJECT DESCRIPTION

During 2002, Council completed a project that documented a Great Lakes Native Vegetation and Biodiversity Planning Framework Options Report and a Draft Biodiversity LEP. Since this time, Council has continued to consider the mechanisms relating to the adoption and formulation of effective protocols to implement biodiversity conservation principles. In 2006, Council was directed by the NSW Government to prepare a new principal LEP for the LGA and biodiversity conservation within this LEP framework is still being considered and developed. This includes consideration of the establishment of ecological landscape settings as part of the planning system to overlay and augment the new LEP zones, development of parameters pertaining to the development of biodiversity plans of management and biodiversity conservation incentive provisions (including development incentives for conservation). More recently, it has been recognised that Council should prepare and adopt a Biodiversity Strategy, with a vision, objectives, guiding principles and actions. As such, there is a need for ongoing ESR funds to strategically monitor, manage and conserve biological diversity and biological function across the Great Lakes LGA for the benefit of current and future generations.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

The Biodiversity and Conservation Framework recognises the critical need to better integrate biodiversity conservation protocols and actions within Council planning and decision-making. In this regard, several outcomes have been achieved to date. This includes the collation of a biodiversity database for the LGA and the commencement of the preparation of a Biodiversity Strategy. Furthermore, there has been a program to enhance understanding and awareness of biodiversity by Council staff and the general public, along with development of biodiversity planning mechanisms associated with the development of the new principal LEP. These outcomes have established the basis for an integrated and holistic strategy for enacting biodiversity conservation within the LGA, which will complement the outcomes of other associated projects, including the Vegetation Strategy, Wallis Lake Wetland Strategy, threatened species management, corridor planning and management and catchment initiatives.

FUTURE DIRECTION / NEXT STEPS

It is critically important to document a Biodiversity Strategy, which develops and implements a holistic and integrated biodiversity conservation framework across the LGA and provide the strategic platform and the tools/ mechanisms to enable proactive, innovative and effective biodiversity conservation, management and where required, restoration across the LGA. As such, there is a need for significant effort over the next three-years to document, publish and adopt the strategy and then an ongoing need for its rational and effective implementation, monitoring and adaptive management.

16.20 Threatened Species Management

PROJECT JUSTIFICATION

Council, as a primary land management agency, is significantly involved, both directly and indirectly, with threatened biodiversity management. It has direct obligations and responsibilities through threatened biodiversity recovery and threat abatement planning processes and priority action statements. Council decision-making, through strategic planning and the development assessment process, as well as the management of public lands and legislative obligations associated with the implementation of approved recovery plans and threat abatement plans can influenced threatened biodiversity management significantly. As a result, Council has commenced a program of improved threatened biodiversity data collation and management planning, including mapping processes for endangered ecological communities and endangered populations as well as the publication of action plans for specific threatened species.

Brush-tailed Phascogale captured at Minimbah – a vulnerable species

PROJECT OBJECTIVES

Council has a legislative responsibility to make sound decisions that serve to protect threatened biodiversity and which enhance the recovery of threatened biodiversity. As such, the focus of threatened species management is to:

- Retain inherent knowledge to make informed decisions pertaining to threatened biodiversity that enhances recovery prospects in nature and at worst, does not worsen the plight of threatened biodiversity
- Collate data and information on the habitat, ecology and status of threatened biodiversity to aid in decision making
- Document the recovery actions/ threat abatement actions to be incorporated in Council activities and decision-making to ensure that threatened biodiversity is appropriately managed, protected and recovered in nature

PROJECT DESCRIPTION

Council's Ecologist, who is employed through the ESR, has established and maintains a threatened biodiversity database and documents information sheets and action plans for threatened biodiversity. The intent of the information sheets is to summarise general data on lifecycle, habitat and ecology and provide relevant and current information on the distribution, habitat, status and ecology of threatened biodiversity within the LGA. This information is then utilised in the preparation of a list of conservation/ management actions to be implemented to protect, manage and restore that threatened biodiversity. Where a Recovery Plan is in operation, the information sheets are used as a means for documenting the relevant recovery actions and outlining a framework for the adoption of such actions. In this manner, Council is better able to meet its statutory obligations. Furthermore, detailed mapping of specific endangered ecological communities (especially coastal floodplain communities) has been pursued through this management framework and there is a commitment to the ongoing education and awareness of Council staff on threatened species and biodiversity conservation in order to enhance threatened species management performance.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

To date, Council has collated detailed lists of threatened species, populations and ecological communities within the LGA, through access to relevant databases, available literature and other sources. Furthermore, Council has commenced the documentation of threatened species information sheets and action plans, including the osprey, *Asperula asthenes, Tylophora woollsii* and others. Within this program, Council has also provided in-kind support for specific threatened species management programs. Holistic and proactive threatened biodiversity management shall benefit the quality and integrity of the Great Lakes environment generally and ensure that Council meets its statutory and moral responsibilities. The coordinated knowledge of threatened biodiversity is consistently and appropriately utilised in development assessment planning, strategic planning, assessment of Council activities, Council land management and in community education and awareness campaigns.

FUTURE DIRECTION / NEXT STEPS

There is a need to continue the documentation and adoption of threatened biodiversity information and action plans and encompass such in a guiding framework to ensure the continued accumulation of threatened biodiversity knowledge and facilitate the implementation of decisions/ actions to support recovery planning and threat abatement planning. Further, there is a need to develop threatened species survey and assessment guidelines for this LGA as well as continue to develop procedures for the mapping of threatened biodiversity and their habitat. There is a significant need to develop a program of monitoring threatened biodiversity status and performance in this LGA, to be used in an adaptive framework.

16.21 Hawks Nest/ Tea Gardens Endangered Koala Recovery

PROJECT JUSTIFICATION

After experiencing serious decline, the population of Koalas in Hawks Nest/ Tea Gardens was listed as Endangered in 1999. In 2004, the NPWS, with assistance from Council, prepared and approved a Recovery Plan for this population. Council is given significant responsibilities via decision-making and actions within the approved Recovery Plan to restore the koala population to a position of viability in nature. Council is thus working as a key part of an interagency team to protect this population and restore its viability. Further, Council has also recognised the need to protect and restore the koala and its habitats and act to reduce the threats to koalas which include habitat loss and fragmentation, dog attacks, road deaths, and risk of disease, for the benefit of the local community and biodiversity generally. This includes sound decision-making in DA assessment, strategic planning and reserve management.

A Koala moves through urban Hawks Nest – Tuloa Street (*Photo courtesy of Ian Morphett*)

PROJECT OBJECTIVES

The program seeks to work in partnership with other relevant agencies to make decisions and undertake actions that will assist the restoration of the koala population of Hawks Nest and Tea Gardens to a position of viability in nature. It seeks to do such through:

- Working as a partner in the implementation of the Approved Recovery Plan
- Making decisions with respect to development assessment and strategic planning that benefit the recovery of the koala population
- Educating the local community on the wider benefits, including biodiversity benefits of protecting the local koala population

PROJECT DESCRIPTION

Council was actively involved in the development of the Approved Recovery Plan for the endangered Koala population between 2002 and 2004. The Plan recognises the significant statutory role of Council in the protection and restoration of Koalas. Since the adoption of the Recovery Plan, Council has committed funding and the in-kind contribution of technical staff to the implementation of recovery actions outlined within the Recovery Plan, including the establishment and administration of a Koala Working Group (KWG), which consists of representatives of DECC, Council and the community. The KWG is supervising the implementation of the Recovery Plan and the framework for effective and rational interagency and community cooperation. The KWG has been successful in securing funding for the implementation of recovery actions related to Koala habitat mapping, monitoring, roadkill blackspot identification and establishment of a records database. Of the 21 listed actions, 1 action has been completed, 5 actions have been commenced but not completed, 12 actions have been commenced and are ongoing and 3 actions have not been commenced. In particular, Council has been involved in habitat mapping, assessment planning and community support.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$20,000	$1,000	Staff In-kind	$21,000

PROJECT OUTCOMES / BENEFITS

Key achievements and outcomes of this project include, but are not limited, to the following:

- The establishment and administration of the Koala Working Group to oversee the implementation of the Plan
- Progressing the implementation of the 21 recovery actions including habitat mapping, strategic planning and community education and awareness
- Development of working documents pertaining to strategic revegetation/ landscaping and assessment
- Contributing to on-ground koala habitat enhancement through replanting, weeding and reserve management

The outcomes of this project will benefit not only Koalas, but also urban biodiversity and amenity generally within the Hawks Nest/ Tea Gardens locality and serve as a model for similar initiatives elsewhere in NSW.

FUTURE DIRECTION / NEXT STEPS

There is a need for Council, relevant agencies and the community to continue the implementation of the 21 listed recovery actions set out in the Approved Recovery Plan. This requires a continuing in-kind and financial commitment from Council. There is a specific need for the continued administration of the Koala Working Group, the existing education and awareness campaign and the finalization of the urban habitat and vegetation mapping projects already commenced. Further, there is a need to continue in-kind contributions by officers employed by the ESR to the finalization and adoption of the revegetation/ landscaping strategy and survey and assessment guidelines.

16.22 Common Mynah Control Program

PROJECT JUSTIFICATION

After noticing an increase in population numbers of the pest species Common or Indian Myna (*Acridotheres tristis*) and screening ever-increasing calls from concerned residents, Great Lakes Council became a partner in a community education grant driven by community Hallidays Point Tidy Towns, in conjunction with Hastings Landcare, Manning Landcare and Greater Taree City Council.

This 12-month project sought to educate and engage the local community in a Common Myna control and education campaign and facilitate community trapping of this invasive and damaging exotic species. There is increasing concern with respect to the ecological and social effects of this pest animal, particularly with regard to biodiversity and health.

The Common (Indian) Myna is now a common sight in Great Lakes urban and some rural areas

PROJECT OBJECTIVES

The project aimed to produce high quality, relevant and user-friendly education materials pertaining to the problem of Common Mynas and explaining how residents can assist in the control of this species. As such, the projects partners sought to:

- Educate the community of the problem of Common Mynas;
- Engage the community to change behaviours to reduce opportunities for feeding and nesting by this species; and
- Oversee and supervise a community trapping program using appropriate Common Myna traps in an ethical, responsible and positive manner.

PROJECT DESCRIPTION

A steering committee of partner representatives met monthly during the life of this project to review control and education efforts elsewhere in NSW and to devise education materials (brochures, posters, bin stickers etc). They also coordinated workshops to deliver information to community and engage the wider urban and rural community in the trapping program. The Great Lakes Area ran two such workshops and engaged over 50-volunteers into the trapping program. Education materials were produced and distributed through council offices and events.

The steering committee were very mindful of deploying this program within established networks in a format similar and equivalent to other similar regional programs to ensure consistency of message and ethical deployment of the trapping program.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$23,500*	Staff In-kind	$23,500

* - This grant was provided to Manning Landcare and which GLC was a partner.

PROJECT OUTCOMES / BENEFITS

The project delivered several workshops (two in this LGA) which described the problem and demonstrated the trapping component of the project, delivering hands-on training in the construction and use of the Common Myna Trap. Six (6) postcards were designed, produced and distributed. One brochure and one handbook were also produced and distributed. One radio information segment was designed and aired on community radio. Four A3 posters were designed and one large banner produced for each partner. Public bin stickers were also produced and installed on public bins throughout each LGA. Further, using grant funds, trap materials were bought and used to construct traps with community members. In addition, 5 rosella nest boxes were constructed and used in demonstrations at field days. As such, the project served as an effective education campaign for the community on the risks and threats associated with this invasive species and the behaviours and tools available to control their expanding populations.

FUTURE DIRECTION / NEXT STEPS

The program is now being entirely run by community, with some support from Council (education materials; contacts etc). The volunteers complete all the trapping and data collection. There is a need to designate and resource a Council Officer to oversee and supervise the program through data entry, volunteer support and monitoring of the Common Myna population. Future funding would be required to expand the trapping program beyond its current reach and deploy additional management and control measures, such as better managing food scraps and pet feeding, instituting controls at major roosts and designing developments to retain a diverse and active native avian fauna.

16.23 Coastcare

PROJECT JUSTIFICATION

The Great Lakes LGA currently has twenty-six (26) volunteer "care" groups (including the over-arching 'network' group) with over 100 active members working on environmental projects within coastal and marine areas.

This membership translates into an average of 12,600 volunteer hours per year, which when valued equates to some $378,000 of voluntary effort for the enhancement and management of the coastal and marine environment.

This project serves to utilise this resource to broaden the scope of volunteer work, support the individual projects as needed, raise the capacity of volunteers with on-ground training and field days, seek funding to support groups and to raise membership and diversity of people involved in environment "care" groups. The project is derived from the HCRCMA CAP and conforms to several local plans.

Some members of the Great Lakes Coastal Land Management Network on a field trip to Sea Acres (Port Macquarie) in September 2008

PROJECT OBJECTIVES

The key project objectives of the Coastcare program facilitated by the Coastcare/ Bushcare Officer at Great Lakes Council are:

- To facilitate networking between "Care" groups;
- To derive external funding to support "Care" groups and their on-ground and educational programs;
- To engage and educate the broader community about pertinent environmental issues;
- To raise the profile and promote membership of volunteer and other environmental groups;
- To build capacity of local communities with regard to NRM and coastal and marine issues;
- To provide relevant training, education, and information to volunteers and the broader community; and
- To access funding to support natural resource management works in the Great Lakes LGA.

PROJECT DESCRIPTION

Great Lakes Bushland Volunteers work on around 200-ha of public land, where they treat environmental weeds, such as Lantana, Bitou Bush, Morning Glory, Senna, Asparagus fern and Morning Glory (and a host of others) and conduct other activities for restoration and regeneration. The groups work regularly at their designated site, treating target weeds, removing litter, replanting, installing wind barriers and dune stabilising fences and pedestrian accessways to beaches and foreshores. Council staff offers technical and practical support, providing training and guidance, as well as materials and tools. ESR funds are also used to match external grant funding for on-ground works and support. Since 2004, the Council has used external funding to employ contract regenerators to work alongside volunteer groups providing hands-on training and assistance with difficult aspects of each project (problem weeds, steep or difficult terrain). This model raises the skills and capacity of each group, and expands upon the on-ground works they complete. Council staff also runs and promotes field days to engage the local community into the projects.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$5,000	$178,000	Staff In-kind	$178,000

PROJECT OUTCOMES / BENEFITS

Great Lakes Bushland Volunteers work in 26 groups across at least 200-ha of Council managed land and National Park Estate. A conservative estimate of volunteer labour equates to around $378,000 per annum and over the period from 2005, has levered over $200,000 in federal and state funding. The groups have established successful bush regeneration works on public land, with additional flow-on benefits such as raising local weed awareness, engaging local communities in caring for "their patch" and social and health benefits for participants (largely retirees). The outcomes particularly for bushland quality and function have been immense and are beneficial to the community as a whole. An important element of this program includes the training, skills development and general and specific education that is facilitated by Great Lakes Council staff and contractors to the community volunteers.

FUTURE DIRECTION / NEXT STEPS

The program needs to be continued and managed in order to provide and facilitate networking opportunities between groups, funding to assist groups with ongoing, on-ground bush regeneration support and training, funding for the community nursery, direction and planning for on-ground works, engagement of new volunteers, promotion of volunteer works through media and internet and directing volunteers in out-reach community weed education. As such, the ESR is fundamental to the continued implementation and extension of this important environmental and community project across the Great Lakes LGA.

16.24 Marine Education

PROJECT JUSTIFICATION

With the completion of the HCRCMA Catchment Action Plan in 2006, marine protection and community education and engagement became an important focus for Great Lakes Council's Community Support Officers. Furthermore, with the implementation of the Port Stephens-Great Lakes Marine Park in 2007, marine conservation and awareness education became considerably more significant for adjacent local government areas, such as the Great Lakes area. As such, Great Lakes Council committed to the support of a Marine Education program, including organised lectures, field excursions and the formation and action of the Great Lakes Underwater Group (GLUG), which conducts scientific dives and undertakes marine clean-up activities across the near-shore marine environment.

GLUG team members on an organised dive in March 2009

PROJECT OBJECTIVES

The aim of the project is:

- To raise community awareness about marine science and conservation through a lecture series called the Marine Discovery Series;
- Organise and deploy extension activities and programs (such as Rocky Shore Education programs (Project Aware on the Rocks; Summer Coastcare Activities); and
- Engage local residents in an underwater volunteer group, which would then be trained and supported to collect fish data and assist the Marine Parks Authority with compiling local fish inventories and the care, protection and monitoring of the near-shore marine environment.

PROJECT DESCRIPTION

Community education has been delivered in several forms. The Marine Discovery Series is a series of evening lectures delivered by experts in their field, and has attracted people from all ages in good numbers. The Summer Coastcare field excursions were focused on Wallis Lake Seagrass biodiversity and significance, Aboriginal Cultural Heritage, near shore reef biodiversity and conservation and a rock-pool ramble. Each excursion was also well attended, with a large number of school-aged children and their carers participating.

Project Aware on the Rocks is a course-like project, where participant attend a series of lectures about rocky shore biodiversity and ecology, then each is required to produce a community education tool of their own choice (poster, brochure, power-point session) relating to rocky shore conservation. Two courses have been run with over 30 people completing projects.

Great Lakes Underwater Group (GLUG) formed in May 2008, and has a membership of over 65 people (not all are active). The group has successfully attracted two grants, and is currently working with the Marine Parks Authority to compile fish inventories for our region, as well as completing underwater clean-up dives. The membership expands constantly.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$600	$54,601	Staff In-kind	$55,201

PROJECT OUTCOMES / BENEFITS

The following project outcomes and benefits have been realised by this program to date:

- Seven Marine Discovery Lectures held with attendance of average of 25 people to each event;
- Two Project Aware on the Rocks community education programs run, engaging over 30 people;
- One Summer Coastcare program completed, with four activities engaging over 100 people in February 2009;
- GLUG formed in May 2009, and has completed 20 dives at 18 sites, four of which were clean-up dives.

All components of the project appear in the media frequently, with over 10 local newspaper articles published to date. As such, the marine education program has been innovative and has achieved real success in community awareness of the marine environment.

FUTURE DIRECTION / NEXT STEPS

GLUG has a current Community Coastcare grant with a completion date of July 2010 and will be diving regularly over the next 14 months. The 2009 Project Aware on the Rocks will be completed in late May with further external funding required to extend this course. It is envisaged that the Summer Coastcare Program shall be run annually, but this dependent upon relevant grant funding and the availability of a relevant supervising officer (engaged through the ESR).

16.25 Seagrass Education

PROJECT JUSTIFICATION

Wallis Lakes supports over 20% of the total seagrass beds in NSW and also and ranks in the top 3 estuaries in terms of aquatic production in NSW.

Seagrass beds are extremely beneficial in maintaining the health of estuarine environments, providing habitat and food for fish and other organisms, stabilising sediment thus decreasing turbidity and absorbing dissolved nutrients reducing toxic blooms. Seagrass beds, however, are extremely susceptible to catchment inputs such as sediment, nutrients and physical damage. Consequently seagrass communities are perfect candidates as biological indicators, their health and viability painting an accurate picture of catchment health. Great Lakes Council has continued its seagrass education program to monitor this habitat resource and inform the community of its values and functions to aid in pollution control and reduction.

Seagrass dip-netting provides an interactive and education opportunity for all ages

PROJECT OBJECTIVES

Council has responded to community needs and abilities with regard to seagrass monitoring programs and altered its seagrass program to deliver broader community education and awareness raising activities. All community engagement and education activities are aimed at raising awareness and educating people about the significance and protection of Wallis Lake seagrass bed, with broadscale monitoring of seagrass beds being completed externally by appropriate research agencies with relevant expertise (CSIRO and Department of Primary Industries) via satellite imagery. As such, the focus of this program has evolved from monitoring to community education with the intent to inform the public of the plight of local seagrass beds and their critical ecological roles and functions.

PROJECT DESCRIPTION

In this project, field days are conducted whereby community members are trained in seagrass monitoring techniques in partnership with the Community Environment Network (CEN). These field days are utilised as a fun and interactive tool to engage the community and raise awareness of the importance of seagrasses.

Other activities include dip-netting and field trips to showcase the marine organisms that live within the seagrasses. Extension of education into stormwater pollution and other threats to seagrass beds is easily delivered at these field days. The program includes both the general public as well as schools elements.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$3,900	$0	Staff In-kind	$3,900

PROJECT OUTCOMES / BENEFITS

This type of education fosters an understanding and ownership of seagrass beds which is vital to ensure the protection of these communities. Education on seagrasses and associated organisms transforms public perception of seagrass to one of custodianship and conservation.

Since 2005, Council staff has delivered 2 community field monitoring days, incorporated a dip-netting education component on two Stormwater Scampers (Primary Education Activity) and have also delivered Seagrass Education at two school holiday extension activities. Each activity has been well attended and feedback has been positive from participants. A seagrass activity component of the Stormwater Scamper Booklet has been devised, and at each activity, all species observed are recorded and reported to DPI to assist in data collation and adaptive management. During such activities regionally significant species are often identified and documented (sch as pipefish, etc).

FUTURE DIRECTION / NEXT STEPS

It is envisaged that there shall be a continuation of the delivery of seagrass education in the community as part of broader water quality improvement education. There is also the opportunity to develop a species list/ booklet of organisms that live within the Wallis Lake seagrasses to enhance education programs within the area. Seagrass will continue to be an important part of community education in the Wallis Lake Catchment and will link in with other programs, such as the implementation of the WQIP. As such, continued and expanded ESR support is important for the evolution of this program.

16.26 Envirofund Projects

PROJECT JUSTIFICATION

"Envirofund" was introduced by the Commonwealth Government as a branch of Natural Heritage Trust Funding for community groups to complete on ground restoration works and community education programs.

The GLC Coastcare/ Bushcare Officer has been responsible for applying for funding through Envirofund to support Community Volunteers with their restoration projects at a range of sites across the Great Lakes LGA.

Since 2004, 14 applications have either been made in the Great Lakes LGA for natural resource or cultural management or bushland restoration by the Coastcare/ Bushcare Officer or have been supported by the officer for external projects. Of these 10 were successfully funded and delivered.

Steve Brereton (DECC) delivers an Aboriginal Cultural Heritage Awareness session at Burgess Beach

PROJECT OBJECTIVES

The objectives of this particular program are to:

- Capitalise on volunteer efforts in the Great Lakes Area by levering Commonwealth funding to support on-ground works and extend education outcomes;
- Provide technical support and expertise to natural resource management community groups in grant preparation and project management across a range of bushland and cultural heritage management and restoration programs; and
- Extend the outcomes of Council management programs on public lands by working collaboratively with the community in the deployment of Commonwealth NRM funds.

PROJECT DESCRIPTION

Individual projects for both volunteer groups and external projects were designed and submitted to the funding agency, to raise funds for environmental projects in the Great Lakes Area. Projects included dune stabilisation works, weed management, community education and foreshore stabilisation works.

A large component of all the grants has been to place professional bush regenerators on the ground with volunteers on their designated work day. This model allows for hands on training and guidance of volunteer works on public land, and achieves real capacity building within these groups. Regenerators also complete additional weed control works outside of the groups' capacity.

This model has been successfully implemented for four years and will form the model for future volunteer support grants.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$86,560	Staff In-kind	$86,560

PROJECT OUTCOMES / BENEFITS

The following projects were successfully funded and delivered through the Envirofund program, GLC and the bushland volunteers: One Mile Beach ($13,715); Tuncurry Dunecare ($7,865); Coomba Foreshore ($11,870); Cellito Beach ($15,351); Smiths Lake Education Program ($6,255); Green Point ($7,636) and Volunteer Support and Aboriginal Cultural Heritage Education Program ($45,447).

External projects that have been support and developed by the Coastcare Officer include: McBride; Tobwabba Burial Ground Restoration (Forster LALC); and Charlotte Head Regeneration Program (NPWS).

A total of over $150,000 has been resourced through Envirofund for both GLC volunteer groups and external projects.

FUTURE DIRECTION / NEXT STEPS

'Envirofund' has now been superseded by the "Caring for our Country" program. Two grants were successfully funded for community groups in round one of the caring for our country funding. Volunteer groups will continue to be supported by council with applications through these funding avenues to provide on-ground support and training to groups. It is envisaged the ESR will continue to provide for the engagement of a dedicated and trained Coastcare/ Bushcare Officer to support the community groups in their funding and natural resource management endeavours.

16.27 Cellito Beach Regeneration Program

PROJECT JUSTIFICATION

This project has focused on the regeneration and protection of littoral rainforest (~11ha) and Themeda grassland on sea cliffs (~1ha), both of which are listed as Endangered Ecological Communities in NSW, as well as an area of coastal scrub (0.7ha). Two threatened plant species are known to exist on site, *Cynanchum elegans* and *Syzygium paniculatum* and these works protect significant local populations of these plants. Furthermore, a sizable population of the regionally significant *Stackhousia spathulata* is found on the foredune area. In addition, Cellito Beach contains two registered Aboriginal heritage sites. The landscape is under threat from weed invasion, human impacts (vandalism, illegal camping, human waste), erosion and rainforest dieback. Smiths Lake Landcare members work each Monday morning to maintain specific areas of the vegetation. Council staff, with assistance from the ESR, coordinates and facilitates these community efforts.

Weeds and dead native plants - Cellito Beach 2005

PROJECT OBJECTIVES

The project has adopted the following key objectives:

- Coordinate and conduct works that seek to reduce weed volumes within and around the significant vegetation communities of the land and to restore self-sustaining and viable natural vegetation communities;
- To reduce human impacts on EEC's and Aboriginal sites of the land
- To raise community awareness about weeds and other threats to the site;
- To support local Landcare volunteers with on-ground works and community engagement / education; and
- To protect remaining rainforest from further dieback and weed invasion.

The project has achieved key successes to date and has made progress to the attainment of the key objectives.

PROJECT DESCRIPTION

The project has seen the employment of professional bush regenerators to not only work alongside volunteers, but to treat weeds in areas not maintained by the group (steep hill areas, cliff edges, rocky outcrops). Weeds in the rainforest are treated systematically, selectively leaving a protective hedge on the sea-ward edge to minimise risks and threats associated with rainforest dieback and the effects of exposure and coastal wind on native vegetation. The most significant weeds include bitou bush, lantana, winter senna, cape ivy, moth vine and coastal morning glory and such species have been targeted in regenerative efforts. The project has also resulted in wind fence installation at five sites (about 25-metres length) along the sea-ward edge of the rainforest where vegetation vandalism has seen the retreat of the rainforest. Pedestrian access has been defined with board and chain paths and bayco® fences in front of sensitive forest areas. Rubbish is removed from the forest weekly to enhance the amenity and quality of the native landscape.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$32,583	Staff In-kind	$32,583

PROJECT OUTCOMES / BENEFITS

Since its inception, the project has achieved the following outcomes for the enhanced quality of the local landscape:

- Treated an area of 8-hectares for weed invasion, including primary and follow-up control and targeting the main weed species recorded on-site: *Chrysanthemoides monilifera* var. *rotunda, Araujia sericiflora, Delairea odorata, Ipomoea cairica, Lantana camara* and *Senna glabrata* var. *pendula*;
- One newsletter has been produced and disseminated to the community and users of the area;
- Three educative signs have been installed onsite;
- 3000 endemic tube-stocks of native flora species have been planted; and
- 30m of protective wind fencing has been installed, pedestrian access has been formalised and 30m of exclusion fencing has been installed.

FUTURE DIRECTION / NEXT STEPS

Current funding (CfOC) has been secured for 2009 - 2010 to consolidate regeneration works within the rainforest and on Bald Head (immediately north of Cellito Beach). Aboriginal sites are to be assessed and protected in conjunction with the Forster Local Aboriginal Land Council and DECC. Interpretative signage is to be installed along the boardwalk (flora identification; ecosystems descriptions) and one field day is to be held onsite. Local schools will be engaged and children activity booklets are to be produced. It is intended that volunteer membership needs to be expanded. The external funding needs ongoing commitment and support from the ESR both for officer time and involvement as well as matching contributions of funding.

16.28 Coomba Aquatic Gardens Project

PROJECT JUSTIFICATION

The Coomba Aquatic Gardens site is around 9-hectares in size, with a wetland complex that comprises some 5.6-hectares. Within the wetland complex around 3-hectares of Coastal Saltmarsh borders Wallis Lake and is under threat from Feral Deer, weed encroachment and altered hydrology and stormwater pollution.

A local Landcare Group has been maintaining the area since 1994, however, their active membership limits the extent of their on-ground works to the upper peninsula and grounds maintenance (mowing). Severe infestations of morning glory, senna and lantana in the upper wetland and boundaries of the saltmarsh prompted Great Lakes Council to apply for external funding to assist the group in managing the wetland for optimal ecological function.

Saltmarsh at Coomba Aquatic Gardens

PROJECT OBJECTIVES

The primary goals of the program were to:

- Systematically remove the worst of the weed infestations from the perimeter and core of the wetland;
- To achieve ecological resilience at the site which would enable the Landcare Group to maintain its ecological health into the future;
- To provide on-ground training for the Landcare Group and raise their capacity to complete ecological management of the site; and
- To engage the broader community in the program and raise the profile of saltmarsh and wetlands as an ecologically valuable community in the Coomba Area.

PROJECT DESCRIPTION

The project was funded under the Environmental Trust Fund for a period of three years from January 2007-2009, with support provided by the ESR principally through the employment of a dedicated officer to oversee the expenditure of the grant funds. A contract Bush Regenerator was employed to work alongside the Landcare Group, teaching them best practice bush regeneration techniques, weed and native plant identification, and prioritisation for the site. The contractor would also work alone, tackling the worst of the weed infestations on the site using best management practice. The community education component aimed to engage the local community into the project, to educate residents about the ecological significance of the site and to raise awareness about threats to these wetland areas, such as stormwater pollution, feral animal impacts, weeds and green waste dumping. Community Education components were delivered through interactive field days, evening information sessions, after school group activities, and printed materials such as newsletters and posters.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$30,000	Staff In-kind	$30,000

PROJECT OUTCOMES / BENEFITS

The following outcomes and achievements have been made as a direct result of this project:

- 3.5ha of wetland has been managed for environmental weeds, an area now maintained by the Landcare Group. Weeds treated included camphor laurel, coral tree, senna, lantana, morning glory and asparagus fern;
- With regards to the education component: three four-paged newsletters were distributed to local residents, two educational posters and one saltmarsh activity booklet were produced and one field day, one evening information session and two after school activity sessions were delivered; and
- 400 native tubestock were planted.

These works enhance the quality of the local environment and restore a significant wetland area.

FUTURE DIRECTION / NEXT STEPS

The site is still infested with morning glory, particularly in the upper edges of the wetland. Passionfruit, a relatively new species, is expanding its reaches in the wetland and becoming problematic. The coral tree infestation is largely under control, but will need follow-up. External grant funding will be required to complete the primary weed control works to a level that is then manageable by the Landcare Group. The Landcare Group effectively has only one member completing bush regeneration works and needs expanded membership. The ESR should continue to engage the services of the professional Bushcare/ Coastcare Officer to support and oversee this program into the future.

This project was a joint venture between Smiths Lake Landcare and Great Lakes Council and was devised as a proto-type to produce printed environmental education materials for the village of Smiths Lake.

The Landcare members were concerned that the local environment was threatened by increasing population and that resident's were unaware of the value of the local environment, nor the threat that common practices pose to the bushland reserves and lake (eg. plant selection in gardens, pet control and management, pollution through gardening techniques and car maintenance).

The project was devised to engage local residents in their local environment and its management (eg. Bush regeneration along the foreshore).

Over 30 local residents at the "Weeds in our bush" field day, November 2005

PROJECT OBJECTIVES

The key project objectives of the Smiths Lake education program were to:

- Create an educational package with information pertinent to the area of Smiths Lake, but which could also be used to provide and facilitate environmental education elsewhere in the Local Government Area;
- Provide local residents with information about sustainable practices in their home and gardens so as to maintain the ecological integrity of the Smiths Lake area;
- Engage local people in the management issues facing local bushland areas and the adoption of sensitive and sympathetic behaviours towards the natural environment; and
- Motivate them to become proactive in volunteering for bush regeneration of foreshore areas.

PROJECT DESCRIPTION

The project designed and compiled eleven (11) brochures for the package, including a comprehensive weed booklet that focused on common and popular garden escapes that potentially threaten bushland areas. Other brochure topics included in the package included environmental gardening and cleaning practices, stormwater pollution, four-wheel driving in the area, wildlife protection and bushland friendly neighbours.

Further, the project organised and delivered a program to treat and remove invasive environmental weeds from 1.5-ha of the Smiths Lake foreshore through the efforts of a new volunteer group that was established as a direct result of the program. The project also delivered four (4) field days and engaged over 100 people throughout the implementation of the program.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$1,514	$6,881	Staff In-kind	$8,395

PROJECT OUTCOMES / BENEFITS

In terms of the project outcomes and benefits, the following achievements were made:

- Education packages were delivered to around 400 local residents and local caravan parks;
- Around 100 local people were engaged directly in the project through field days and local market promotions; and
- A new volunteer environmental care group was formed and now meets weekly to maintain a 1.5 ha area of Lake foreshore that was primarily treated as part of the project.

The education package contents have now been used in other environmental education programs, with the weed booklet and the "bushland Friendly Neighbours" poster proving highly useful for extension education activities.

FUTURE DIRECTION / NEXT STEPS

The project was completed in May 2007. The weed booklet has been revised and will be reprinted for distribution and education in 2009. The Great Lakes Coastal Land Management Network continues to lobby for funding to expand the package and deliver it to the broader community.

Works to enhance the Smiths Lake environment and educate the local community shall be delivered via wider programs facilitated by the ESR.

16.30 School Environmental Education Program

PROJECT JUSTIFICATION

Environmental education delivered to the local schools by Council staff supported by the ESR is generally centred around water quality, stormwater pollution, and waste and recycling. There is also an involvement with regards to threatened species recovery planning undertaken as part of this program. The schools program is very effective. By educating students on environmental issues, there is a benefit to the wider family awareness Furthermore, working with the school teachers and curricula to expand instruction and knowledge of environmental issues is effective and proactive. The schools education occurs through national events such as Water Week, Clean Up Australia Day and World Environment Day as well as Waterwatch programs. In many instances, local schools approach Council requesting assistance to deliver environmental education. However, Council also proactively approaches local schools, with respect to topical local issues.

Students identifying water-bugs

PROJECT OBJECTIVES

The main objectives of environmental education in schools are:

- To raise awareness of local environmental issues;
- To encourage behavioural change within the students and their homes; and
- Support the teachers and the curricula in delivering effective environmental messages.

The primary means of delivering this information is through water quality testing (Waterwatch), Water Bug Surveys, Seagrass Identification and Awareness, and education on catchment processes. In this respect, Council staff employed by the ESR, facilitates a strategic and targeted school's environmental education program on an annual basis.

PROJECT DESCRIPTION

The delivery of environmental education to schools occurs in a number of ways:

- School visits - involves taking a display, handouts, samples of water or water bugs to schools and talking to students in the classroom;
- Field trips - short visits to local wetlands and waterways to explain natural and human-induced processes and impacts, including Waterwatch;
- Excursions - such as the Stormwater Scamper which involves each student gaining hands on experience in water quality testing, monitoring water bugs, conducting site assessments and interviewing professionals in the research field; and
- Targeted presentations and collaboration with teachers within the scope of the wider education curricula.

Therefore, the schools program is highly beneficial and its continuation requires officers employed through the ESR to continue their delivery of this program.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

Through this strategic, targeted and proactive program, students become more aware of natural processes within their surroundings and are informed about the range of small things and behavioural changes that they can do to improve or protect these environments. The environmental monitoring component of the schools education program provides a database of information that can be used by both council and schools and allows the students to learn how to follow up the information gained in the field. It also assists spread environmental messages to the wider community via the students.

FUTURE DIRECTION / NEXT STEPS

It is highly beneficial and positive that the school education program facilitated by the ESR to deploy trained, experienced and knowledgeable officers for a strategic, targeted schools education program be maintained and extended in the future. This would develop and extend the positives already achieved through elements of the program such as Stormwater Scampers and continue to provide students with action learning opportunities. Council will also continue to visit schools and conduct or attend field trips for students on a range of specific and general environmental issues.

16.31 Healthy Lakes Program

PROJECT JUSTIFICATION

In 2001, Council established the diverse and wide ranging Healthy Lakes Program (HLP) to address urban water quality issues through community education and awareness. The driver for this program stemmed from several studies which have identified stormwater pollution, fuelled by significant population and development pressures, as a significant threat to water quality. The focus of the program has since expanded to incorporate education for sustainability principles and themes which align with regional strategies and priorities. In doing so additional funding and resources has been secured to deliver aspects of the program and enable partnerships to be established with other organisations to deliver key outcomes for catchment improvement. Furthermore the program has evolved to meet the growing needs of the community with a broader focus on climate change, energy and water use, ecological foot-printing and sustainable living.

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Local business receives free energy audit

PROJECT OBJECTIVES

The primary objectives of the Healthy Lakes Program are to:

- Engage the local community in education for sustainability initiatives to generate an understanding of environmental issues effecting the Great Lakes;
- Build the capacity of residents through participatory action learning activities to reduce the occurrence of everyday living impacts on the local environment; and
- Form strong working relationships with key stakeholders including government organisations, the community and businesses to facilitate long term behaviour change.

PROJECT DESCRIPTION

Several approaches and activities are used to engage a wide cross section of the community through the Healthy Lakes Program. These include: stormwater scampers to engage students in water quality and estuarine monitoring activities to generate an understanding of catchment issues and avenues for protection; business awards for premises that demonstrate best practice environmental management; one on one engagement of residents to discuss stormwater issues and to promote behaviour change to reduce their impacts; promotion of GreenPower as a sensitive alternative to coal fired energy production with the incentive of free home and business energy and water audits for those who sign up to the initiative; presentations and workshops with primary and high school students as well as the University of the 3rd Age on water quality importance and protection; presence at environmental events including the Small Footprint Initiative to promote water quality protection through reducing our everyday impacts.

BUDGET

ESR Expenditure	Grant Expenditure	In-kind Contribution	Total
$54,000	$25,000	Nil	$79,000

PROJECT OUTCOMES / BENEFITS

The HLP has delivered several outcomes which include: the engagement of over 100 local businesses through an established network to promote best practice environmental management through the chamber of commerce business awards, media and case studies; conducting two stormwater scampers with primary and secondary students; door knocking over 50 residents to discuss stormwater quality issues and provide relevant information packs on the issue; the delivery of a sustainable gardening workshop for local residents; providing free energy and water audits to two local businesses and four residents as an incentive for signing up to GreenPower; and establishing strong partnerships with other government organisations to deliver shared outcomes.

FUTURE DIRECTION / NEXT STEPS

Funding has been secured through the NSW Environmental Trust to implement an Urban Sustainability Program which includes among other projects the delivery of 200 home and 10 business energy and water audits. This project will be the focus of the HLP over the next two years providing an avenue for ongoing resident and business engagement. The program has also benefited from the approval of a stormwater levy which has generated additional funds for community education and awareness activities. This funding will value add to existing ESR activities and allow the continuation of successful projects including stormwater scampers, community engagement through water quality device installation and other important water quality and sustainability initiatives.

16.32 Environmental Events and Green Dates

PROJECT JUSTIFICATION

The Great Lakes is host to many environmental and sustainability events throughout the year. Council staff strives to attend such events and provide static displays and officers for activities and presentations. These events are used to promote council activities and projects to the wider community. Council also utilises national and international days (green dates) to promote environmental education and awareness. These include World Wetlands Day, World Environment Day, Threatened Species Day, etc. These themed events provide an excellent opportunity for targeted community education on environmental issues relevant to the local area.

Council stall at the Small Footprint Initiative

PROJECT OBJECTIVES

In attending community events it is hoped that projects that are undertaken by council and its partners receive greater recognition within the wider community. It also provides an opportunity for volunteers who are keen to help out with any of the projects to sign up and gain contact with council staff. Attending local events provides an avenue for the community to put a face to council and our programs. For national and international green dates Council hosts stalls and events to inform the community at a local scale.

As such, the overall objective of Council's participation in environmental events and green dates is to enhance and expand community awareness, education and empowerment on a range of issues, including wetlands, sustainability, water quality and rural management practices.

PROJECT DESCRIPTION

In addition to the wider environmental education program, Council staff attends the following events on an annual basis and provides information, static displays, presentations and general engagement with the community:

- Sustainability Fair (now disbanded) and the Small Footprint Initiative
- Walk on the Wild-side and Riverside Festival
- Baby Boomers Bash
- Bulahdelah Show
- Clean Up Australia Day

Further, Council participates in a range of Green dates including but not limited to World Whale Day, World Environment Day, Earth Hour, World Wetland Day, National Water Week and International Biodiversity Day. General information is distributed and dialogue and communication encouraged on local issues and solutions.

BUDGET

ESR Budget	Grant Funds Received	In-kind Contribution	Total
$0	$0	Staff In-kind	$0

PROJECT OUTCOMES / BENEFITS

Environmental events and green dates provide Council with the opportunity to deliver a message directly to the community on a personal level. The benefits of this form of engagement are that the correct and appropriate information reaches the community and questions are answered by knowledgeable staff directly. These events have also proven valuable in signing up new members and volunteers to help with a number of projects including seagrass monitoring, bush regeneration, water quality monitoring and marine groups. As mentioned, they also make Council staff known to the community, which encourages greater consultation and empowerment on environmental matters and issues. As such, Council's participation and involvement in environmental events and green dates is a very important element of the wider environmental education program.

FUTURE DIRECTION / NEXT STEPS

Council shall continue to actively engage the community through these events and green dates and endeavour to adapt the program as new issues and events arise. In that manner, continued in-kind contribution to the success of environmental events and administration and organisation of activities that coincide with green dates is an important element of the wider environmental education program of Great Lakes Council.

17 ESR BUDGET

An overview of the ESR budget between July 2005 and March 2009 is provided below:

Project/activity Description	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	Total ESR last 5 years	Other Contributions (excl. gst)	Total
Wallamba Riverbank Management and Rivercare plan Implementation	$40,000	$35,000	$40,000	$10,000	$0	**$125,000**	$370,864	**$495,864**
Darawakh/Frogalla Wetland Management Plan rehabilitation project	$210,767	$155,150	$252,700	$210,000	$293,100	**$1,121,717**	$3,109,205	**$4,230,922**
Great Lakes Catchment Committee and rural incentives program for implementation of Wallis Lake Catchment Plan and Myall Catchment Plan	$36,500	$31,000	$29,000	$27,800	$21,250	**$145,550**	$250,000	**$395,550**
Karuah catchment management	$0	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$94,480	**$94,480**
Sustainable rural land management program - Wallis and Myall CMP implementation	n/a	n/a	n/a	n/a	Staff in-kind plus in-kind of $20,000	**Staff in-kind**	$400,722	**$400,722**
Crawford catchment management plan	n/a	n/a	n/a	n/a	Staff in-kind	**Staff in-kind**	$106,800	**$106,800**
Coastcare/Bushcare program officer costs	n/a	$5,000	Staff in-kind	Staff in-kind	Staff in-kind	**$5,000**	$178,000	**$183,000**
Fish passage	n/a	n/a	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$69,563	**$69,563**
Seagrass monitoring	$2,900	$1,000	$0	$0	$0	**$3,900**	$0	**$3,900**
Smiths Lake Estuary Management Plan implementation	$5,100	$33,500	$20,600	$0	$20,333	**$79,533**	$58,000	**$137,533**
Wallis Lake Estuary Management - Sediment Hydrodynamics study	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$25,000	**$25,000**
Staffing costs	$169,100	$170,135	$211,400	$205,134	$219,656	**$975,425**	$0	**$975,425**

Project/activity Description	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	Total ESR last 5 years	Other Contributions (excl. gst)	Total
Administration costs - plant running costs and training	$0	$19,376	$27,298	$29,000	$25,572	**$101,246**	$0	**$101,246**
Wallis Lake Wetland Management Strategy	$0	$0	$0	Staff in-kind	Staff in-kind	**Staff in-kind**	$1,345,000	**$1,345,000**
Hawks Nests/ Tea Gardens endangered koala recovery Plan implementation	$5,000	$5,000	$0	$5,000	$5,000	**$20,000**	$0	**$20,000**
Biodiversity conservation framework	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$0	**Staff in-kind**
Vegetation Strategy	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$0	**Staff in-kind**
Threatened Species Management	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$0	**Staff in-kind**
Common Mynah Control Program	n/a	n/a	n/a	Staff in-kind	Staff in-kind	**Staff in-kind**	$0	**Staff in-kind**
Envirofund Projects	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$86,560	**$86,560**
Cellito Beach Regeneration	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$32,583	**$32,583**
Coomba Aquatic Gardens	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$30,000	**$30,000**
Marine Education	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	Staff in-kind	**Staff in-kind**	$103,944	**$103,944**
Stormwater quality monitoring	$3,000	$3,000	n/a	n/a	n/a	**$6,000**	$0	**$6,000**
Water quality improvement - Boronia Wetland, Goldens Road and Pipers Creek	$27,233	$16,400	$5,070	$16,260	$23,450	**$88,413**	$122,264	**$210,677**
Forster Keys Walkway	$3,000	Staff in-kind	Staff in-kind	$0	$0	**$3,000**	$10,000	**$13,000**

Project/activity Description	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	Total ESR last 5 years	Other Contributions (excl. gst)	Total
Structural Solution maintenance	$92,000	$110,000	$110,000	$90,000	$90,000	**$492,000**	$0	**$492,000**
Lower Hunter REMS	n/a	$20,000	$20,000	$22,500	$20,395	**$82,895**	$0	**$82,895**
Coastal Catchment Initiative	n/a	n/a	$50,000	$80,000	$0	**$130,000**	$2,135,000	**$2,265,000**
Sustainability Strategy	n/a	Staff in-kind	Staff in-kind	Staff in-kind	$10,000	**$10,000**	$20,000	**$30,000**
Urban Sustainability and Wallis Lake Partnership Project	n/a	n/a	n/a	n/a	Various project funds	**n/a**	$1,160,000	**$1,160,000**
Healthy Lakes Program	$17,000	$5,000	$2,000	$15,000	$15,000	**$54,000**	$25,000	**$79,000**
Port Stephens Estuary Management Plan Implementation	$0	$25,000	$0	$0	$0	**$25,000**	0	**$25,000**
Total	**$611,600**	**$634,561**	**$768,068**	**$710,694**	**$743,756**	**$3,468,679**	**$9,732,985**	**$13,201,664**

18 FUTURE DIRECTIONS

18.1 Program Vision

The Program Vision for the Environmental Special Rate is:

We shall actively participate in a partnership with the community, government and stakeholders:

- **to protect, maintain and, where required, restore and enhance the condition and function of the natural environment and its biodiversity, including the health of local waterways;**
- **to deliver enhanced sustainability performance with respect to land use and development;**
- **to recognise and elevate the understanding of the community of the importance of a functioning natural environment in a manner that leads to an elevated sense of empowerment by the community;**
- **to capitalise and extend the strategic and on-ground investment in natural resource management using the ESR as a driver in the leverage of funds;**
- **to monitor and report on the state of the local environment and apply such knowledge in an adaptive sense;**
- **to act strategically across a landscape scale to achieve real and positive outcomes for the community and the environment; and**
- **adopt best management practice with respect to strategic planning and on-ground management of natural resources in the Great Lakes LGA.**

This Program Vision shall be reflected in the expenditure of the Environmental Special Rate into the future.

18.2 Extending Our Partnerships

As has been identified in this report, much of the successes of the ESR to date could have only been achieved through the partnerships and community support that have been identified, fostered and maintained.

An approval to increase and extend the ESR provides the mechanisms, tools and staff to maintain and expand existing partnerships and community connections in the future to capitalise on past successes and build on the significant momentum that has been generated to date.

This benefits environmental management across the LGA in two (2) main ways:

- By educating partnering agencies and the community, there is behavioural change that gives effect to great environmental outcomes and more sustainable lifestyles across the Great Lakes LGA. There is a shared vision and a common objective shared by the Council, the community and relevant stakeholders that is very powerful and which generates and sustains its own momentum; and
- Partners are likely to continue their significant funding support for Great Lakes environmental programs and sustainability initiatives. It is herein reported that the

> ESR funds have been consistently used by Great Lakes Council to successfully lever additional external State and Commonwealth funding, to increase the environmental expenditure. The ESR was, on average, multiplied by 2.8-times in external funding support over the last 5-years for a total value of expenditure of some $13,201,664. It is possible through extended partnerships to maintain this level of external funding support to achieve local, regional, State and Commonwealth environmental objectives and targets.

As such, the models and protocols developed by Great Lakes Council should be observed and considered in the wider context as a useful model that can be adopted by local government in their agency and organisation partnerships and community connections across NSW to give effect to efficient and positive environmental outcomes.

Thus, an increased and extended ESR is critical to achieve the aspirations of Great Lakes Council with respect to community networking and connection and partnerships with key and relevant agencies and organisations. Great Lakes Council has been spectacularly successful in this in the past and the continued and enhanced ESR would facilitate further ground-breaking and effective efforts into the future.

18.3 Local Funds to Secure External Funds

As reported in this document, during the period 2004 to 2009, the ESR generated some $3,468,679 to which there was $9,732,985 of additional and external contributions, yielding a total expenditure on the environment of $13,201,664 ($2.64M per year on average) across the Great Lakes LGA.

This represents leverage of external funding support in the order of 2.8-times the original ESR on average each year over the last five-years. This is a spectacular result, demonstrating the significant and critical value of the ESR to the improvement and management of the local and regional environment and the attractiveness of the environmental programs of Great Lakes Council for co-investment by the State and Commonwealth Government, which have been fostered and cultivated through sound and effective partnerships with funding providers and agencies. This does not even cost and consider the unquantified in-kind contributions of the urban and rural community and local NRM groups, which would also be significant and consequential.

An extension and continuation of the ESR allows this leverage and agency support to continue, to evolve and to expand. For instance, Great Lakes Council proposes to utilise a small increase in the ESR to facilitate dredging outcomes for the community on a 1:1 basis with the NSW Government for environmental and social outcomes in local waterways. There is also proposed to be a small increase in the ESR, which can be used to seek external funds to enhance sustainability outcomes and embed sustainability-principles into day-to-day operations and performance of Council.

Thus, the extension and increase of the ESR allows for the magnification of environmental expenditure and projects to be maintained, cultivated and developed into the future to continue to showcase best management practice NRM outcomes for the people and the environment of the Great Lakes LGA.

18.4 Proposed Projects and Expenditure

This report has demonstrated the beneficial outcomes and uses of the Great Lakes Council ESR between 2004 and 2009.

One of the most critical justifications for the establishment of the ESR as a permanent feature of Council's management protocols and budgets is the need to service and maintain the infrastructure and programs that have been implemented since 2001.

This includes maintenance and extension to structural solutions through to the implementation of priority actions identified within strategic plans facilitated through the ESR.

Furthermore, it is proactive and beneficial that new plans, programs, monitoring and feedback and protocols be developed, refined or extended in order to extend the success of natural resource management outcomes to date.

Consequently, the Natural Systems and Estuaries Branch have developed a draft expenditure program for the next 10-years with ongoing projects identified.

This outlines the resources required to adequately service the programs that have been achieved to date and devise and implement the new programs and protocols that are required to further develop natural resource management programs as a core function of Council.

This program is documented in the table below.

Proposed Environmental Special Rate Program 2009/ 10 to 20013/ 14 and Beyond

Proposed Environmental Rate Increase Projects	Year 1 2009/2010	Year 2 2010/2011	Year 3 2011/2012	Year 4 2012/2013	Year 5 2013/2014	Ongoing	Total
Environmental Projects - 5% Per Year							
Natural Systems Branch - staff labour costs	$330,000	$341,000	$355,000	$368,000	$378,000	TBD	$1,772,000
Costs of administration	$25,000	$25,000	$30,000	$30,000	$30,000	TBD	$140,000
Wallamba Riverbank management	$40,000	$40,000	$50,000	$50,000	$50,000	TBD	$230,000
Darawakh Creek /Frogalla Swamp wetland restoration	$200,000	$50,000	$0	$0	$0	NA	$250,000
Great Lakes Water Quality Improvement Plan	$135,000	$130,000	$132,000	$151,000	$180,000	TBD	$728,000
Wallis and Myall Catchment Management- sustainable rural land management	$29,000	$30,000	$35,000	$32,000	$35,000	TBD	$161,000
Karuah Catchment Management	External	External	$25,000	$27,000	$30,000	TBD	$82,000
Coastcare Program	External	External	External	External	External	TBD	$0
Smiths Lake Estuary Management Plan implementation	$20,000	$0	$20,000	$20,000	$20,000	TBD	$80,000
Port Stephens Estuary Management Plan implementation	$0^	$0^	$0^	$30,000	$50,000	TBD	$80,000
Sustainability Strategy development and capacity building	$20,000	$20,000	$50,000	$40,000	$50,000	TBD	$180,000
Structural solutions for water quality	$100,000	$100,000	$100,000	$100,000	$100,000	TBD	$500,000
Healthy Lakes Program	$15,000	$15,000	$15,000	$15,000	$15,000	TBD	$75,000
Koala Recovery Plan Implementation	$5,000	$8,000	$5,000	$5,000	$10,000	TBD	$33,000
Threatened species management	$0^	$0^	$0^	$0^	$0^	TBD	$0^
Hunter Regional Environmental Management Strategy	$22,000	$23,000	$23,000	$23,000	$23,000	TBD	$114,000
Community education program - education for sustainability	$15,000	$15,000	$20,000	$20,000	$40,000	TBD	$110,000
Implementation of Sustainability Action Plan eg. cycleways	$30,000	$50,000	$50,000	$50,000	$50,000	TBD	$230,000
Wetland management program - Wallamba River, Wallis Lake Islands and Wallis Lake Wetlands	$50,000	$200,000	$250,000	$250,000	$250,000	TBD	$1,000,000

Proposed Environmental Rate Increase Projects	Year 1 2009/2010	Year 2 2010/2011	Year 3 2011/2012	Year 4 2012/2013	Year 5 2013/2014	Ongoing	Total
Coastal Management Plan	$20,000	$50,000	$15,000	$15,000	$0	TBD	$100,000
Biodiversity conservation - development offset scheme	$0	$30,000	$10,000	$15,000	$0	TBD	$55,000
Maintenance dredging – 1% Per Year							
Pipers Creek	$50,000	$0	$0	$0	$0	TBD	$50,000
Corrie Channel	$140,000	$0	$0	$0	$0	TBD	$140,000
Hydrodynamic study - Wallis Lake	$30,000	$0	$0	$0	$0	TBD	$30,000
Feasibility study Tuncurry beach sand deposition - stage 1	$0	$100,000	$0	$0	$0	TBD	$100,000
Lower Myall sediment dynamics and water quality study - stage 1	$0	$100,000	$0	$0	$0	TBD	$100,000
Feasibility Tuncurry - stage 2	$0	$0	$50,000	$0	$0	TBD	$50,000
Completion of lower Myall study and approval - stage 2	$0	$0	$50,000	$0	$0	TBD	$50,000
Maintenance dredging of Wallis Lake - Tuncurry Channel / Long Island	$0	$0	$100,000	$0	$0	TBD	$100,000
Maintenance dredging of Wallis Lake - Hells Gate, Breckenridge Channel boat harbour	$0	$0	$0	$220,000	$0	TBD	$220,000
Lower Myall Estuary - Corrie Channel stage 2, eastern (shortcut) channel (subject to feasibility study)	$0	$0	$0	$0	$100,000	TBD	$100,000
Dredge sand deposition site rehabilitation - Goodwin and Cockatoo Islands	$0	$0	$0	$0	$120,000	TBD	$120,000
Tern Island renewable deposition site establishment	$0	$0	$0	$0	$0	TBD	$0
TOTAL	**$1,276,000**	**$1,327,000**	**$1,385,000**	**$1,461,000**	**$1,531,000**	**-**	**$6,980,000**

^ These projects are entirely based on staff in-kind contributions without direct cash funding. Staffing costs associated with the ESR are identified generally in the row entitled "*Natural Systems Branch – staff labour costs*"). All of the projects above require, in some part, in-kind contributions from staff employed by the ESR and to which there is no estimate of actual costs determined for this report.
TBD To Be Determined; Project is ongoing
NA Not applicable

It is important to note that the above table outlines indicative projects and budgets, which may be subject to revision or modification. Furthermore, the table does not include anticipated concurrent external funding.

19 CONCLUDING REMARKS

Great Lakes Council is applying to the Minister for Local Government for the permanent establishment of the ESR at an increased rate.

This report has outlined the achievements and successes of the ESR between the period 2004 and 2009 and has provided clear and transparent justification for seeking the permanent establishment of the ESR such that Council can:

- Continue to incorporate the policies and practices that achieve sustainable management of natural resources as a core Council function;
- Adequately service the existing infrastructure and programs that have been established during the 8-years of the ESR, including the critical maintenance of structural solutions for water quality including constructed wetlands and gross pollutant traps and convert strategic plans to on-ground actions;
- Capitalise and extend upon the significant environmental outcomes achieved to date;
- Continue to implement priority environmental actions arising from local planning documents as well as regional and State initiatives for the betterment of the local environment and the economy which it supports;
- Continue to work with and empower the community to foster increased awareness of local environmental issues in a positive manner;
- Devote a degree of resources to the monitoring of environmental projects that will benefit future programs in a local, regional and State context; and
- Continue to be at the forefront of best practice environmental management in a local government context and attempt to establish Wallis Lake and the wider Great Lakes LGA as a centre of excellence.

Without the permanent establishment of the ESR, the current and planned future programs of Great Lakes Council, including key partnerships with the Hunter/ Central Rivers Catchment Management Authority and other Government agencies, and the dynamic team that has been established would be critically discontinued. This would manifest itself through negative environmental outcomes as the programs would be discontinued, maintenance needs may not be able to be feasibly resourced and new programs that are critically required may not be designed and implemented. The progress that has been made would be lost, perhaps irreversibly. Potentially a more profound effect might be that the community itself would become disillusioned with the discontinuity that the cessation of this project would create.

Consequently, there is very strong justification for the permanent establishment of the ESR at Great Lakes Council inclusive of a small increase to that rate. This document provides clear evidence that the ESR has been utilised effectively and that natural resource management has been embedded as a core function of Council. Furthermore, the ESR has been associated with outstanding environmental outcomes that will have long term social, economic and natural heritage benefits and has been successfully used to lever considerable external funding contributions. The ESR has widespread industry and community support and has allowed Council to establish effective partnerships with State and Commonwealth agencies and other key stakeholders. A tangible benefit of these partnerships is the pooling of local, State and Commonwealth resources to achieve best-value for money on-ground outcomes. This is exemplified by the fact that the ESR itself has raised $3.47M over 5-years but Council has been able to lever an additional $9.73M from external sources over this timeframe.

Any discontinuation of the ESR at this stage would be catastrophic, leading to longer-term environmental decline and community discontentment. Council can demonstrate significant achievements and key progress over the last 5-years of the ESR and it is therefore imperative that the ESR is permanently established within its budgetary and administrative protocols.