Living LAKE MACQUARIE

The Office of the LAKE MACQUARIE & Catchment Coordinator

WORKING TO **REVIVE**, **RENEW** AND **PROTECT** THE ECOLOGY OF LAKE MACQUARIE

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Improvement Project Delivers Impressive Results to Lake Macquarie

Recently recognised as one of the most successful of its kind in Australia, the Lake Macquarie Improvement Project has delivered some impressive results over the past ten years.

Since the environmental improvement project began in 1999 there has been a significant improvement in the water quality of the Lake and increases in seagrass coverage.
According to Lake Macquarie and Catchment Coordinator, Jeff Jansson, the innovative approach used to improve the environmental health of Lake Macquarie has set high standards in the improvement of an estuarine system that has been highly impacted by development.

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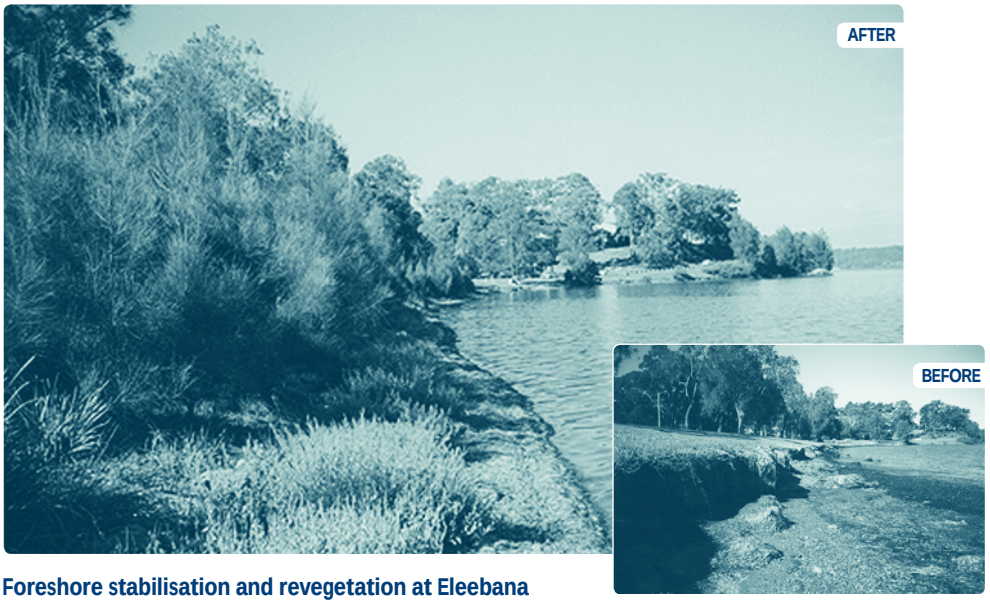

Foreshore stabilisation and revegetation at Eleebana

Welcome

Greg Piper
Chairman,
Lake Macquarie
Project Management
Committee

Welcome to the latest edition of the Living Lake Macquarie Newsletter.
As the Lake Macquarie Improvement Project draws to a close, I would like to thank everyone who has worked so hard to help make the project such a great success.
The past ten years has seen a very real improvement in the health and amenity of our Lake and surrounding environment. With an integrated approach to on-ground works and community awareness, the project has delivered a significant improvement to water quality, including a 113% increase in water clarity and the restoration of many significant wetlands. Bio-diversity has improved with a range of marine creatures that either had disappeared, or were greatly reduced in numbers, now being more commonly sighted.
There has also been a positive shift occurring within the local community. Proof of this has been the number of registered Landcare groups working to improve the environmental health of Lake Macquarie growing from 22 to 260 within this time.
A new understanding of natural systems and the role they play in a sustainable and healthy environment is a key contributor to the Project's success. We have achieved great improvements in the Lake's health by concentrating on the catchment and restoring or replicating the way nature works, rather than using traditional hard engineering methods to fight natural processes. An example of this is the naturalising of old concrete drains and watercourses (see page 4).
The simple message is that 'natural is best'.
The term of appointment by the Minister for the Lake Macquarie Project Management Committee, and consequently, the Office of the Lake Macquarie and Catchment Coordinator and the Lake Macquarie Improvement Project will cease on 30th June 2009. I am confident, however, that both Lake Macquarie City Council and Wyong Shire Council will continue activities in a similar manner to ensure the restoration of Lake Macquarie and its Catchment.
It is appropriate at this stage to recognise the commitment by former Premier Bob Carr and his Government in partnering with Council and the community for this to occur. Government Agency staff and community representatives have made huge efforts to ensure the best possible outcomes. The involvement of people such as Ian Kiernan and Professor Bruce Thom were instrumental in ensuring proper commitment to the project.

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Major Project Achievements

- Installation of 62 stormwater treatment devices (with a major focus on wetlands).
- Rehabilitation of approximately 33 kilometres of Lake foreshore and estuarine creek bank.
- Rehabilitation of 15 State significant wetlands.
- Over 600,000 endemic plants planted through Landcare.
- An increase from 22 to 260 volunteer Landcare groups.
- Significant improvements in water quality.
- Significant increase in seagrass coverage.
- Winner of the 2008 National Thiess Riverprize for waterway improvement.

Facts on Lake Macquarie

- Lake Macquarie is one of Australia's larger coastal lakes with a surface area of 110 square kilometres sitting in a catchment of 640 square kilometres.
- The catchment supports a population of almost 200,000.
- The Lake has a long constricted channel entrance with the ocean resulting in a 1% tidal exchange.

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Welcome

For the overall delivery of the Project, I would like to thank Jeff Jansson and his team in the Office of the Lake Macquarie and Catchment Co-ordinator. Their professional skills and approach, along with their commitment to improving our environment, ensured the best possible outcomes.

My involvement with this project has been one of the most rewarding I have had during my time on Council. As well as all those who have been directly involved, I would like to thank the residents of Lake Macquarie for the support they have shown by continuing to support the use of a ratepayer funded Lake Levy over the life of the project.

For more information on the Lake Macquarie Improvement Project go to: www.livinglakemacquarie.org

I hope you enjoy this final edition of the Living Lake Macquarie newsletter.

Greg Piper

Mayor of Lake Macquarie
Chairman, Lake Macquarie Project Management Committee

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Improvement Project Delivers Impressive Results to Lake Macquarie

"In partnership with the local community, we have been working hard towards improving the health and ecological sustainability of Lake Macquarie. The success of this project reflects a change in thinking aimed at preserving and replicating natural systems, rather than adopting traditional hard engineering solutions," Mr Jansson said.

Occasional visitors to Lake Macquarie would observe the many changes achieved by the remediation project. These include the installation of 62 stormwater treatment devices to reduce sediment and nutrient loads, rehabilitation of more than 33km of Lake foreshore and creek bank areas to reduce erosion and reinstate riparian and littoral vegetation, and the removal of 6,000 cubic metres of organic sediment to eliminate nutrients sources and improve recreational amenity. Teams of volunteers have also helped rehabilitate 15 priority natural wetlands and plant around 30,000 endemic plants each year.

In the past year alone, the Lake Macquarie Improvement Project has taken out the prestigious national Theiss RiverPrize, featured in an international book on best practice waterway improvement projects and has hosted visitors from Japan interested in setting up a similar project for a large lake near Tokyo.

Part of the project has also been to implement a pro-active community awareness program, which has developed a permeating culture of green living throughout the community.

According to Mayor and Lake Macquarie Improvement Project Chair, Greg Piper there has been a positive shift occurring within the local community since the Project began ten years ago. Proof of this has been the number of registered Landcare groups working to improve the environmental health of Lake Macquarie growing from 22 to 260 within this time.

"Without the support of these dedicated volunteers many projects would not have been completed," Cr Piper said.

As the project draws to a close Lake Macquarie and Wyong Councils will both implement an environmental program to ensure that the health of the Lake continues to improve and is maintained.

"The success of this project reflects a change in thinking aimed at preserving and replicating natural systems, rather than adopting traditional hard engineering solutions..."

Vegetated concrete channel at Speers Point

...Lake's Latest

RECENT PROJECTS

- **Alexander Parade, Arcadia Vale** Foreshore stabilisation works and creation of a sloping beach to help improve the Lake's ecosystem.
- **Sheppards Creek, Valentine** Creek stabilisation, using rock fillets and riparian planting, to encourage vegetation regrowth and improve water quality.
- **William Street, Cardiff** Construction of a wetland to improve the water quality of Winding Creek and provide a possible water source for irrigating nearby sporting fields.
- **Hely Avenue, Fennell Bay** Foreshore stabilisation works and creation of a sloping beach to help improve the Lake's ecosystem.
- **Thomas & Macquarie Streets, Barnsley (Flaggy Creek)** Stabilisation of eroding banks, using rockwork and planting.
- **Swansea Flats & Myuna Bay** Two Salt Marsh areas were recreated to break down built up seagrass wrack.
- **Regal Way, Valentine (Gatts Farm Reserve)** Channel modifications, including replacing sections of concrete channel with riffle ponds, rock scour protection and re-establishing vegetation to improve water quality.
- **Dobson Street, Swansea (Caravan Park Reserve)** Foreshore stabilisation work and creation of a sloping beach to help improve the Lake's ecosystem.
- **Wyee Point Reserve, Wyee** Foreshore stabilisation work and creation of a sloping beach to help improve the Lake's ecosystem.

Constructed wetland at William St, Cardiff

- **Stenhouse Drive, Eleebana** Bush regeneration activities, weeding and planting to stabilise the riparian area and improve habitat and water quality.
- **Bulgonia Rd, Brightwaters** Foreshore stabilisation and vegetation work along a foreshore reserve to help improve the Lake's ecosystem.
- **Edden Street, West Wallsend (Flaggy Creek** Creek Stabilisation involving rock work to address bed scour to an upper reach section of Flaggy Creek.

CURRENT PROJECTS

- **Wilton Close, Warners Bay** Installation of a gross pollutant trap and a vegetated channel to remove sediments and nutrients from stormwater flow.
- **Boronia Street, Bolton Point** Maintenance dredging to remove sediment accumulation from stormwater outlets to improve seagrass coverage and enhance natural habitats.
- **Wippi Reserve, Coal Point** Foreshore Stabilisation works and creation of a sloping beach with vegetation to help improve the Lake's ecosystem.
- **Green Point, Belmont** Foreshore stabilisation works to prevent erosion of bank to upper beach area.

UPCOMING PROJECTS

- **Macquarie Drive, Croudace Bay** Construction of a gross pollutant trap and removal of a concrete channel to install riffle ponds and vegetation to improve water quality entering Sheppards Creek.
- **Winding Creek, Glendale** Construction of a wetland to improve the water quality of Winding Creek.
- **Cocked Hat Creek, Edgeworth** Creek naturalisation, involving the removal of a concrete channel and construction of riffle ponds, with plantings to encourage vegetation and improve water quality.
- **Boronia Street, Bolton Point** Foreshore Stabilisation works and creation of a sloping beach with vegetation to help improve the Lake's ecosystem.
- **Grand Parade, Bonnells Bay** Maintenance dredging to remove sediment delta from stormwater outlet.
- **Victory Parade, Toronto** Maintenance dredging to remove a sediment delta from stormwater outlet.

7 SIMPLE STEPS ...TO A CLEANER LAKE MACQUARIE

Living LAKE MACQUARIE

1. Help keep pollution out of stormwater drains
2. Fertilise sparingly & caringly
3. Clean up after your pet
4. Carefully store & handle household cleaners, paints & oils
5. Prevent soil erosion
6. Choose native landscaping
7. Preserve & protect our wetland areas

THE OFFICE OF THE LAKE MACQUARIE & CATCHMENT COORDINATOR

Our Lake. Our Future. Ours to Protect

Research Proves Native Vegetation Protects Against Erosion

Recent research has proven that native vegetation can help protect Lake Macquarie's foreshore and catchment from erosion by an increase of up to 752%, compared to bare soil.

Native plants, including a variety of Lomandra Longifolia and Dianella Caerulea species were proven to dramatically reduce the incidence of erosion. Being native species, they are also very tolerant of Australian conditions.

According to Lake Macquarie and Catchment Coordinator, Jeff Jansson the planting of native vegetation is one of the most important activities of the Lake Macquarie Improvement Project. It is also something that residents can also do to help beautify and protect their local area.

"Native vegetation is key to the water treatment process and does more than just make the Lake look beautiful," Mr Jansson said.

The amount of nitrogen that is washed out of the catchment depends on the land use and soil stabilisation. Commercial, industrial and horticultural uses can generate between 20 to 26 kilograms (kg) of nitrogen per hectare per year. Normal urban areas generate between 3 to 5kg, whilst natural bushland only generates 0.9kg.

In drainage lines and water courses, native water plants perform a range of complex processes to remove nutrients and pollutants from stormwater run-off. This is achieved through many natural biological and chemical reactions which oxygenate the water and expel gases like nitrogen into the atmosphere.

Vegetation is also often planted along the banks of streams and ponds, to further assist in improving water quality. Not only does the vegetation bind the bank and filter direct run-off, it offers a range of 'in-stream processes' by shading and ecosystem enhancement that helps to reduce the nutrients within the water.

Lake Macquarie's catchment area has already been heavily altered by human activity, resulting in increased quantities of sediment and nutrient runoff into the Lake. At the same time, more than 75% of the Lake's shore-line areas and creek banks have already been cleared, resulting in native vegetation and important wetland areas being lost in the process.

New plantings of native vegetation along shorelines can help to repair land which has suffered from erosion and prevent sediments and nutrients escaping from the soil into the water.

Without native shoreline vegetation, the water quality in Lake Macquarie is vulnerable to the pollutants which are carried in stormwater.

Naturalising Concrete Channels to Improve Water Quality

Innovative techniques that focus on mimicking natural systems are helping to protect Lake Macquarie from excess sediment and nutrient loads that enter the Lake via stormwater run-off.

The latest round of projects undertaken as part of the Lake Macquarie Improvement Project include the removal of concrete drains at Valentine, Warners Bay, Croudace Bay and Edgeworth, replacing them with natural alternatives that help to filter water before it enters the Lake.

While concrete drainage lines may be very efficient at moving water, they are one of the major contributors to the degradation of our waterways. They deliver stormwater directly to the Lake every time it rains, not only bringing large volumes of nutrients and a cocktail of pollutants, but also causing disturbance to water quality and marine life.

Vegetated riffle ponds replace concrete drain at Gatts Farm Reserve, Valentine.

According to Lake Macquarie and Catchment Coordinator, Jeff Jansson, there has been a shift away from the hard engineering solutions of the past, towards new successful strategies that use natural processes within the environment.

"Different approaches using more sophisticated methods of stabilisation, as well as treating the water are now being used," Mr Jansson said.

After accurate surveys are undertaken to ensure there will be no adverse flooding issues, works often include rock riffles (shallow ponds) that aerate the water; macrophytes (water plants) in the ponds and channels to assist in the removal of nutrients along with riparian (fringing) vegetation around the edges that also assist in removing nutrients.

Works were recently undertaken in Gatts Farm Reserve, Valentine to remove a concrete dish drain. This was replaced with some small riffle ponds and in the steeper sections the concrete was replaced with river rocks and vegetation.

Works undertaken at Wilton Close, Warners Bay involved the removal of a concrete dish drain, which was replaced with a vegetated channel. A Gross Pollutant Trap was also installed.

At Macquarie Drive, Croudace Bay a section of concrete channel will be removed and replaced with two large vegetated shallow ponds to filter water before it enters Sheppards Creek. A Gross Pollutant Trap will also be installed upstream to capture coarse sediments.

At Cocked Hat Creek, Main Road, Edgeworth the upstream section of concrete channel will be removed and replaced with riffle ponds. Native vegetation will also be reinstated to improve the water quality and health of this degraded creek system.