

Schools and Community Help Protect Lake Macquarie

An overgrown and eroding creek infested with weeds at Waratah Avenue, Charlestown, has been given a new lease of life with the help of local school children and community members.

The project, co-ordinated by the Office of the Lake Macquarie & Catchment Coordinator, included two planting days inviting local school children and community members to become involved in the protection and beautification of their local area. All up over 8,800 native species will be planted as part of this project, with 1,800 planted by the community.

"It is very encouraging that there are so many people who are taking pride in their local area and are willing to help protect and enhance the natural environment in Lake Macquarie," said Lake Macquarie & Catchment Coordinator, Jeff Jansson.

In addition to improving water quality, planting around the stream edges with native plants also helps to beautify the area.

In conjunction with the planting, physical works were carried out within the creek to create an effective filtration system to improve water...



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Project Management Officer Jason Parsons with students from Hillsborough Public School



Greg Piper
Chairman,
Lake Macquarie
Project Management
Committee

Welcome

Welcome to the latest edition of the Living Lake Macquarie newsletter. There has been a positive shift occurring within the local community since the Lake Macquarie Improvement Project began nine years ago. In general, community members are becoming

more environmentally aware and conscious about how their actions can impact on Lake Macquarie. The community is also becoming more actively involved in projects to restore the local area, such as the planting day at Charlestown recently. There are now over 260 registered Landcare groups working to improve the environmental health of Lake Macquarie. Without the support of these dedicated volunteers many projects would not have been completed.

Since the project began we have taken a quantum leap in our understanding of natural systems and the role they play in a sustainable and healthy environment. The aim is to preserve or reinstate

natural processes within the environment to protect Lake Macquarie for future generations to enjoy.

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

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

Greg Piper

Mayor of Lake Macquarie
Chairman, Lake Macquarie Project Management
Committee



Lake's Latest

Recent Projects

- **Mitchell Road, Cardiff**
Installation of gross pollutant trap and wetland/infiltration bed.
- **Peggy St, Swansea**
Installation of a gross pollutant trap to remove excess sediments from the base flow of Plains Creek before entering Black Neds Bay.
- **Pelican Inlet Wetland, Little Pelican**
Initial stages of weed control completed to assist in the restoration of 21 hectares of wetland.*
- **Sheppards Creek, Valentine**
In addition to rock stabilisation, 3,600 native species have been planted along the creek bank to improve stability and water quality.

Current Projects

- **Upper Winding Creek, Waratah Avenue, Charlestown**
Creation of riffle ponds to promote creek restoration, in combination with planting of over 8,000 native species.*
- **Cockle Creek, Teralba**
To provide stability, a rock fillet technique is being used in sections combined with planting along 1km of the creek bank.*
- **Chandler Close, Edgeworth**
Construction of a gross pollutant trap and wetland containing 30,000 plants to treat storm water before entering Cocked Hat Creek.*
- **Fullers Creek Wetland, Bonnells Bay**
Restoration of wetland area which also contains areas of important saltmarsh vegetation.*
- **Kilaben Creek, Kilaben Bay**
Combined project with Kilaben Bay Landcare group to prevent sediments from eroding tracks entering Kilaben Creek, involving structures and planting.*

Upcoming Projects

- **William Street, Cardiff**
Construction of wetland to both improve the water quality of Winding Creek and provide a possible water source for irrigating nearby sporting fields.
- **Southampton Avenue, Buttaba**
Installation of a gross pollutant trap to remove sediments from stormwater flows entering Secret Bay.
- **Fennell Bay, Blackalls Park and Letchworth Parade, Buttaba**
Stabilisation and creation of a sloping beach to assist with improving the lake ecosystem.
- **Raggatt Crescent, Edgeworth**
Installation of a gross pollutant trap and series of riffle ponds.*

* SOME FUNDING RECEIVED FROM HUNTER-CENTRAL RIVERS CATCHMENT MANAGEMENT AUTHORITY

Constructed Wetland Underway At Chandler Close, Edgeworth

An existing stormwater detention basin at Chandler Close, Edgeworth will be converted into a wetland to help improve water quality entering Lake Macquarie.

The project, worth an estimated \$250,000, will capture stormwater from a catchment of around 15 hectares, consisting predominantly of residential housing and roadways. Stormwater from the area flows to Cockle Creek before entering Lake Macquarie. The existing stormwater detention basin only holds and then slowly releases water to prevent flooding downstream. In addition to the wetland, a gross pollutant trap (GTP) will be installed to capture coarse sediments. The wetland, with the help of macrophytes

(water plants), will remove the fine sediments and nutrients (nitrogen and phosphorus) that have the potential to cause damage to lake water quality.

In addition to the 1650m² of vegetation planted directly as part of the wetland construction, a further 1.2 hectares of remnant Spotted Gum woodland surrounding the area will also be enhanced.

The Hunter-Central Rivers Catchment Management Authority contributed some funding to this project. ✨

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► ...quality before it enters Lake Macquarie.

"The works will treat storm water run-off by creating a series of shallow vegetated ponds (riffle ponds) and will also prevent erosion by placing rock work and vegetation along the creek bank," Mr Jansson said.

The watercourse, a tributary of Winding Creek, feeds into Cockle Creek before entering the Lake.

The riffle ponds together with the planting

of vegetation have been designed to collect sediment and reduce nutrients from the catchment's storm water flows. They will also filter out other impurities, preventing them from entering the Lake.

"In creating the riffle ponds we are trying to mimic a natural watercourse," Mr Jansson said. The Hunter-Central Rivers Catchment Management Authority contributed some funding to this project. ✨



Work Begins to Rebuild Saltmarsh Areas in Lake Macquarie

One of the most diverse and important coastal habitats, the saltmarsh, will be re-established for the first time on shores of Lake Macquarie at Myuna Bay and Swansea Flats.

Listed as an endangered ecological community, saltmarsh helps to rapidly break down dead seagrass, attract migratory birds and provide a habitat and food for fish and other marine animals during high tide. It is estimated that up to 41 species of fish can inhabit tidal saltmarsh areas.

Found in the low-lying tidal zones between land and salty or brackish water, salt marshes have sometimes been treated as “wastelands”, along with other wetlands. Research has proven that salt marshes are crucial to the ecosystem and form the primary foundation for the food chain with estuaries.

According to Lake Macquarie and Catchment Coordinator, Jeff Jansson, it is estimated that between 60 and 80 per cent of Lake Macquarie’s saltmarsh areas have been wiped out since development began in the 1800s.

The aim of this project is to trial the reconstruction of saltmarsh and use in-depth monitoring results throughout the process to guide future saltmarsh reconstruction projects,

both locally and beyond.

“The saltmarsh areas will also become an educational tool for both the community and council staff, to promote better understanding of these important habitats,” Jeff said.

The saltmarsh at Myuna Bay will be located on the crown reserve land adjacent to the Lake, south of Wangi Road, covering 470m².

At Swansea Flats, the saltmarsh will be located on the foreshore reserve near the corner of Lakeside Drive and Oxley Street, covering 495m².

The creation of both saltmarshes will require the reshaping of the shoreline and excavation of soil to allow for tidal inundation. Once the sites have been prepared, planting will be



Existing Saltmarsh area at Five Islands

undertaken using native salt tolerant grasses and herbaceous ground covers.

“One of the key objectives of the Lake Improvement Project is to reinstate natural ecological processes. Rebuilding salt marsh area will help get the system back in balance,” Jeff said. ✨

New Technique Trialed 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.

One of the latest projects undertaken as part of the Lake Macquarie Improvement Project is the conversion of an old stormwater detention basin at Mitchell Road, Cardiff into a stormwater treatment device.

The project is trialing a new technique using the installation of Atlantis Cells, in addition to planting of wetland vegetation, rock work and construction of a Gross Pollutant Trap to trap coarse sediment. It is worth an estimated \$166,000.

“The Atlantis Cells are an underground modular tank system effective in reducing the volume of stormwater by assisting with infiltration into the water table. This is coupled with the growth of water plants (macrophytes) in the base area to further filter the stormwater run-off,” Lake Macquarie and Catchment Coordinator, Jeff Jansson said.

The recent heavy downpours have tested the effectiveness of the device in trapping coarse

sediments, which so far is proving successful.

The University of Newcastle has begun monitoring at the site to assess the overall effectiveness of this multiple approach to

improving water quality. To ensure meaningful data, testing commenced before work was started and will continue now the project is complete. ✨



Workers preparing the Atlantis Cells

How Stormwater Runoff Damages the Lake's Health

Accelerated sedimentation and nutrient enrichment from stormwater run-off is the single biggest threat to water quality and marine life in Lake Macquarie.

Stormwater run-off affects water quality in a number of ways including turbidity, which prevents light from penetrating into the water and the promotion of algal growths, which as well as preventing light can also starve the water and other marine life of oxygen as it decomposes. While limited sedimentation is a natural process occurring all the time, human impacts speed up the process and place the Lake under stress. When materials like organic soils, detergents and fertilisers enter stormwater via drains they contain materials that increase nutrient levels and throw natural processes out of balance. Even dust that settles on roofs and roadways can be a source of stormwater contamination. In fact, a major problem is the amount of hard surfaces we now construct such as roofing, paved areas and roads that result in large amounts of water flowing down our waterways and into the Lake. Some researchers suggest that urban water flows have increased in volume by 60% to 80%. Our stormwater management systems have become so efficient at moving stormwater away from our urban areas they are now damaging the Lake. In days gone by, stormwater would travel

into the Lake more slowly, through naturally vegetated water courses, wetlands and creeks with ponds. Along this journey, sediments and nutrients were filtered and removed naturally before they entered the Lake. In modern times, with these natural 'kidneys' removed, drainage lines carry stormwater much quicker and in greater volumes, bypassing

"Some researchers suggest that urban water flows have increased in volume by 60% to 80%..."

this natural filtration process and also causing serious erosion problems. We have taken a quantum leap in our understanding of natural systems and the role they play in a sustainable and healthy environment. There is now a worldwide movement to move away from the hard engineering solutions of the past and towards new strategies that preserve or reinstate natural processes within the environment.

Another important challenge is to educate the community on ways to effectively reduce the load of sediments and nutrients at the source. Simple measures include erosion controls, planting native vegetation and sweeping pathways rather than hosing them. To take advantage of this new understanding, a number of progressive developers now use what is termed "Water Sensitive Urban Design" when building new subdivisions. This means leaving and enhancing natural watercourses, providing properly constructed vegetated swales instead of concrete gutters and ensuring that the amount of water leaving the area is similar to prior development. The Office of the Lake Macquarie and Catchment Coordinator has funded a number of projects to re-introduce natural processes back into the environment. These works termed retrofitting include naturalising of concrete drains, planting of native vegetation, creation of riffle ponds and the restoration and construction of wetlands. The works aim to address immediate environmental issues, in addition to long-term strategies to help protect this unique natural resource for future generations. ✨

Fullers Creek Rehabilitation Undertaken at Bonnells Bay

Important mangrove saltmarsh and swamp oak forest between Fullers Creek and Freshwater Creek deltas is being rehabilitated.

The area was showing signs of degradation caused by unrestricted recreational and vehicle access, in addition to widespread weed infestations.

The work included repair and levelling of tracks, weeding and some planting. Fencing to restrict vehicle access and some follow-up weeding is still to be completed.

The Hunter-Central Rivers Catchment Management Authority contributed some funding to this project. ✨



Landcare's bushland regeneration team at work clearing weeds

