Community breathes new life into Lagoon Creek

People everywhere are joining forces to take action on local environmental problems, supported by public funding and professional guidance. However, sometimes the solution may involve bringing in the 'heavy artillery', as **Bryony Barnett** and **Vern Veitch** discovered.

The paddle-powered harvester carving a track through the thick weed mat, helped by small punts. Vern Veitch

New reflections on Lagoon Creek – after the cleanup in 2006. Vern Veitch

A kingfisher dips over Lagoon Creek, a flash of blue reflected on the water surface.

Little more than a year ago, there were no reflections on this small channel on Queensland's Herbert River floodplain – just a dense mat of weeds over the surface, with barely a glimpse of water.

From around 1996 to 2006, Lagoon Creek's seven kilometres of interconnected freshwater lagoons – once a habitat for barramundi and other native fish – had progressively become infested with aquatic weeds.

Nutrient loading from adjacent farmland had promoted uncontrolled growth of weeds such as water hyacinth, giant sedge and para grass, which formed a dense mat on the water surface. This in turn led to oxygen depletion and loss of habitat and biodiversity. It also posed a potential threat to the Herbert River estuary and adjacent Great Barrier Reef.

Today the cleared stretch of water reflects overhanging trees and the hills beyond, and ripples with signs of life.

How did this transformation happen?

A community-wide approach

Lagoon Creek lies four kilometres east of Ingham in Hinchinbrook Shire, and flows eastward into the Great Barrier Reef Marine Park via the mangrove-lined Victoria Creek estuary. It is connected to the Herbert River only during major floods when the river overflows its banks.

The surrounding land is largely planted with sugar cane, with runoff draining into the creek via waterways lined with para grass. Much of the riparian vegetation was removed many years ago for cane growing. However, there has been extensive replanting by the community in recent years.

Prior to 2005 there had been attempts at dealing with the aquatic weed problem, but with limited success.

In 2005, Conservation Volunteers Australia (CVA), WetlandCare Australia and the Australian Centre for Tropical Freshwater Research (ACTFR) at James Cook University were appointed to deliver the Great Barrier Reef Coastal Wetlands Protection Programme (Pilot Programme).

The consortium undertook wide-ranging landholder and community consultation before establishing a community program to remove, control and monitor the weeds in accessible parts of the lagoons. The aim was to restore life in the creek and reduce the threat of oxygen-depleted, high-nutrient water draining into the Great Barrier Reef lagoon.

Further support for the program came from the Herbert River Catchment Committee, the Regional Natural Resource Management Body Terrain NRM Ltd, canegrowers and local landholders.

In total, $280 000 was raised to save Lagoon Creek, mostly from the Australian Government.

Amphibious assault

Starting in early 2006, the project team – scientists, resource managers, landholders and contractors – tackled the weeds using a mix of spraying and mechanical removal, helped by natural wet season flushing.

The workers first sprayed the creek banks with herbicide to release the hold of the weed mat, followed by aerial salt-spraying over the lagoon by helicopter, to break up the solid mat.

While a week of heavy rain subsequently flushed almost half the weed-mass downstream, much of it still remained bound to itself and to the banks of the creek.

It was time to bring in the heavy machinery!

For 10 days in May 2006, the team variously used a bankside excavator with a specially modified grab, an aquatic weed harvester (hired from the Burdekin Shire), and two small boats using simple reef anchors and net booms to remove the remaining weed mat from the most downstream lagoon.

A second assault starting in December 2006 on the second and third lagoons saw the small boats modified with bulldozer-type weed rakes to further improve their efficiency.

This combination of treatments, which had not been tested before, proved to be effective.

The harvester fragmented the weakened weed mat by carving tracks through its surface. Then the boats worked with their rakes to grab the matted weed 'islands' and push them towards the excavator.

Gradually the water reappeared – albeit stirred up by the activity – and a mound

The excavator claws weeds from the water with the help of two small boats. Vern Veitch

'Gentleman Vince' – the cleanup was a community effort with many locals pitching in. Vern Veitch

of rotting vegetation built up beside the lagoon, attracting the interest of local cane-growers looking for nutrient-rich fertiliser.

Slow recovery

So will all this effort make a difference to the health of Lagoon Creek?

Scientists from the ACTFR are seeking answers through a broader-scale monitoring program focused on water quality and fish and bird observations, using baseline data from preliminary monitoring and previous fish-kill studies at the site as benchmarks.

The water was very turbid just after weed removal, followed briefly by a visible algal bloom. This was due to the combined effect of nutrients stirred up from sediment organic matter in the weed roots, and reintroduced sunlight.

However, dissolved oxygen, which is essential for life, has increased rapidly at the surface. The creek now supports an expanding fish community and an increasing bird population that feeds on them.

Early in the project, the scientists recorded only six fish species (including one introduced species) in Lagoon Creek, all tolerant of low dissolved-oxygen levels.

More sensitive species have now returned to the lagoon during the last wet season – a visible and welcome sign of improvement. The monitoring team expect to observe more indicators of improved health in the lagoon, but only with a sustained effort in weed management, and attention to other stretches of the creek.

On reflection

This large-scale wetland rehabilitation project in the Herbert River catchment could not have happened without the combined support of the organisations that provided funding and other assistance, and a firm commitment from the local community.

The project has built on earlier revegetation efforts, and also proved the effectiveness of different weed treatments that can be used in other projects.

Because weeds are prevalent throughout the catchment, the health of Lagoon Creek now depends on regular maintenance. Future weed monitoring and control will continue with funding from the Australian Government.

Meanwhile one landholder and a scientist are back to the drawing board, redesigning their punt as a weed rake – while the trees of Lagoon Creek look down on their new reflections.

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More information:

Department of Environment and Water Resources' Wetlands Section, www.environment.gov.au/water/environmental/wetlands/index.html

WetlandCare Australia, www.wetlandcare.com.au/

Australian Centre for Tropical Freshwater Research, actfr@jcu.edu.au

Putting Queensland's wetlands on the map

Queensland has a diverse arrays of wetlands, with five listed under the Ramsar Convention. These wetlands support 130 fish species, 150 species of waterbirds (resident and migratory), and more than 3000 plant species.

The Queensland Wetlands Programme, established with funding from both the Australian and Queensland Governments, now supports more than 30 projects.

A consortium involving Conservation Volunteers Australia, WetlandCare Australia, the Australian Centre for Tropical Freshwater Research and CSIRO is working with landholders in more than 20 sites around the Great Barrier Reef catchment.

Efforts are under way at a number of sites to trial various methods to remove aquatic weeds; develop local 'work-plans' on weeds and hydrology; trial a wetland grazing management regime; engage property owners in environmentally sustainable production; and develop management techniques to rehabilitate and protect wetlands.

The program achieved a major milestone recently with the completion of mapping and classification of wetlands in the entire Great Barrier Reef catchment. The maps, which provide detailed information about 37 000 individual wetlands, cover 58 million hectares of land and water (see www.environment.gov.au/water/environmental/wetlands/programs/qwp.html).

The Queensland Wetlands Programme has just finished mapping wetlands bordering the Great Barrier Reef, including the Hinchinbrook Island region shown here. Landsat/NASA

The maps will provide planners, landholders and other decision-makers with valuable information for more sustainable management of wetland areas.