The Russell and Mulgrave catchments

The Great Barrier Reef Coastal Wetlands Protection Program Pilot Program was commissioned by the Australian Government to deliver on-ground actions for the sustainable management of 22 priority wetlands in the Great Barrier Reef catchment. The $2 million program was delivered over two years by a consortium led by Conservation Volunteers Australia and involved partnerships between government, community and landowners to identify and protect these wetlands.

Project summary

This Pilot Program project consisted of a wetland 'scoping' study followed by demonstration wetland improvement work on two properties. The purpose of the scoping was to determine the extent of wetlands on both private and public land within the Russell and Mulgrave catchments. Both demonstration wetland improvement projects were on privately owned cane-growing land in the Russell catchment.

Despite the worst possible wet weather conditions occurring in 2006, the attitude of the landowners remained positive and optimistic throughout the two-year project. On the **Lauridsen property**, works to protect the Alexandra palm forest adjoining the Russell River National Park included construction of a sediment trap, riparian and aquatic weed spraying, and revegetation. On the **Bonso property,** the project involved control of Singapore daisy and riparian revegetation work, resulting in the completion of a habitat corridor loop adjoining the Eubenangee Swamp.

About the sites

The two demonstration sites are located on the Russell floodplain 65 km south of Cairns. Both sites are adjacent to national parks and are under sugarcane production. The **Lauridsen property** spans a narrow floodplain between the Russell River National Park and Russell River. It borders an Alexandra palm forest, and was previously cleared and drained for cane growing. The remnant palm forest on the property is contiguous with the neighbouring Cairns City Council Reserve and the Russell River National Park. The palm-dominated swamp forest (RE 7.3.3, Endangered) is the only significant area of this wetland type remaining in the wet tropics. The site also has significant remnant vegetation areas in the riparian zones of the Russell River and Alligator Lagoon that are in relatively good condition.

Photo 1: High-value palm forest wetland located on the Lauridsen property (photo: Mulgrave Catchment Landcare)

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The **Bonso property** borders Eubenangee Swamp (national park) and has the Russell River, Lennons Creek and the Alice River running through it. Eubenangee Swamp is cited as a local, state and Australian priority wetland conservation area[1] with regional endangered/of concern ecosystem types (RE 7.3.1 and RE 7.3.5).

Photo 2: Cane land bordering Eubenangee Swamp (photo: Mulgrave Catchment Landcare)

Challenges

The **Lauridsen property** receives water from the upstream township of Babinda and an adjoining cattle property, and has poor **water quality** (e.g. sediment loading). The palm swamp on the property (and adjoining drains) was infested with **weeds**, particularly hymenachne, water hyacinth and juvenile pond apple, as well as guinea grass and para grass. The riparian zone of the Russell River on the property boundary was also infested with weeds, particularly pond apple and Singapore daisy. **Aquatic weeds** covered approximately 80 per cent of Alligator Lagoon and were causing significant damage to the health of this system.

1 The site is protected as a National Park; is listed as a significant coastal wetland in the Wet Tropical Coast Regional Coastal Management Plan and is also listed under the Directory of Important Wetlands Australia.

Photo 3: Alligator Lagoon on the Russell River (photo: Mulgrave Catchment Landcare)

The **Bonso property** had infestations of Singapore daisy, and other weeds such as para grass and pond apple. There had been a loss of riparian vegetation, and therefore of corridor connectivity, due to past clearing and resulting dominance by the invasive weeds. There was also some bank instability and erosion along parts of the waterways. Alice and Lennons Creeks, which flow out of the national park, needed to be maintained and improved to protect the condition of Eubenangee Swamp.

Scope of wetlands

Approximately 30–40 landholders in the Russell and Mulgrave catchments are on or immediately adjacent to large, regionally significant wetland areas. Another 40–50 have smaller remnant wetlands within or adjacent to their properties. Landowners and associated stakeholders were therefore encouraged to cooperate to protect and improve wetlands. To initiate this process, 55 wetlands were identified and mapped (using EPA mapping tools and aerial photography) to determine their extent. Tenure and owners' and managers' contact details were recorded. Many of the landowners were contacted, to discuss their willingness to participate in future wetland programs and to gauge their perceptions of how such programs should best be run, particularly on private land. Agencies and local authorities were also contacted to discuss how they might work collaboratively with private landowners and other stakeholders.

This scoping exercise was successful in raising awareness of the need to manage wetlands within the Russell and Mulgrave catchments.

Rehabilitation actions

At the **Lauridsen property,** the landowner was given the incentive of a 2-year management fee and operating costs to construct a sediment trap and control weeds in riparian and palm forest areas on the property.

A 60 m × 4 m × 2 m **sediment trap** was constructed on the main inflow drain to the Alexandra palm swamp, to contain sediment transported from upstream sources. Maintenance of this trap will prevent sediment from being deposited in the drains, at the palm forest boundary and in inaccessible parts of the palm forest itself.

Regular **weed inspection and spot spraying** of hymenachne, water hyacinth, para grass, guinea grass and juvenile pond apple formed part of the work within the palm forest adjoining the national park, and in the adjoining drains. Herbicide was sprayed from a boat to **control aquatic weeds** within Alligator Lagoon, and a small excavator was used to remove debris from the lagoon mouth.

Along the riparian areas of the Russell River, weed control was restricted to a level that would allow natural regeneration of vegetation without creating an erosion risk. Herbicide spraying of Singapore daisy and other weeds was carried out, along with pond apple felling and poisoning; but, in order to prevent soil loss, erosion-prone areas were not treated.

Revegetation involved planting 1000 trees along the drains, the Russell River and the sediment trap with the aid of the local Indigenous work crew.

At the **Bonso property**, too, the landowner was provided with a management fee and operating budget to carry out routine spraying of weeds in and alongside riparian planted and natural regeneration areas. **Revegetation** efforts were focused on obtaining a habitat corridor loop from Eubanangee National Park, down Lennons Creek, along the Russell River and back along the Alice River to the national park. This loop was successfully completed within the project timeframe—a credit to the dedication of staff, the landowner and work crews.

Along the **Alice River**, Singapore daisy control was undertaken to restore vegetative connectivity. Manual weed control was carried out only on the upper banks, because the lower banks presented an erosion risk if the daisy infestation was removed. Then 1000 seedlings were planted in 2006, and 1000 more a year later.

In the riparian areas of the **Russell River**, between Lennons Creek and Alice Creek (thus completing the corridor loop), large areas of Singapore daisy infestation were removed with an excavator. Afterwards, 2000 seedlings were planted with the assistance of Mulgrave Landcare and the local Indigenous work crew. Throughout the project, weed regrowth was controlled with herbicide.

Along **Lennons Creek**, which is a high-value habitat corridor from Eubenangee Swamp to Russell River, the bank was too steep for revegetation, so attempts were focused on 'rescuing' and encouraging native vegetation that was struggling to emerge through the Singapore daisy (*see* 'Innovations' below). On the upper banks, the Singapore daisy was sprayed with herbicide, after which the banks were revegetated with seedlings of native riparian species.

Photo 4: Russell River on the Bonso property 11 months after removal of Singapore daisy (photo: Mulgrave Catchment Landcare)

Lessons learnt

Wetland rehabilitation is a difficult challenge in the wet tropics, especially during a prolonged wet season punctuated with extreme weather events. On 19 March 2006, the devastating category 5 Tropical Cyclone Larry traversed the area encompassing both demonstration sites. One month later Cyclone Monica crossed Cape York further north. The destruction and flooding caused by these two events, and the persistent wet weather, delayed all activities for 6 months, including farm work and government clean-up operations. Construction or earthmoving machinery was booked out during the clean-up operations, making it difficult to carry out the planned activities of the Pilot Program.

Short timeframes cannot cater for such unforeseen events. It is very important to take into consideration the climatic and other characteristics of the individual wetland and region when planning rehabilitation. In the wet tropics, it has been suggested that projects utilising heavy machinery need to incorporate at least two dry seasons to achieve a successful result.

The provision of paid labour (work crews) to complement the work of landowners was found to be essential in achieving ambitious outcomes, especially in adverse conditions.

Innovations

Spraying to 'rescue' emergent native seedlings

On the Bonso property, the project trialled a method of natural revegetation on steep slopes, where the removal of Singapore daisy would have caused erosion. Spot spraying herbicide on the Singapore daisy around naturally emerging native seedlings that were struggling through the weed mat gave the seedlings space to grow. This long-term, cheap and time-flexible (though slow), revegetation strategy has been very successful on almost inaccessible creek banks, and has great potential as a mainstream approach in the wet tropics.

Specialised machinery

In view of the scale of the riparian rehabilitation works required, specialised machinery can make the job of the work teams much less difficult. This equipment includes:

- lightweight excavators to remove Singapore daisy before planting seedlings
- a purpose-built spray boom to allow more efficient spraying of herbicide on steep banks.

Dedicated work teams

The project work crews (Conservation Volunteers Australia and an Indigenous team) developed innovative techniques such as rolling the mat of Singapore daisy down the banks to speed up site preparation without destabilising the area. The commitment of the landholders in carrying out follow-up weed control was critical to the success of this pilot project.

Further reading

Corcoran, B 2007, *CWPP-PP wetland 'scoping' study for the Russell and Mulgrave catchments*, Terrain Natural Resource Management.

Contacts

Mulgrave Landcare
Phone: (07) 4056 1205

Terrain NRM (formerly FNQNRM Ltd)
Phone: (07) 4043 8000
www.terrain.org.au

WetlandCare Australia
Phone: (02) 6681 6169
www.wetlandcare.com.au

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