

Douglas Shire wetlands

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

Two wetlands were chosen in the Douglas Shire area as part of the Pilot Program. Although they are only small sites, McDowell swamp and Maslin's wetland are both considered ecologically valuable due to the:

- rarity of these wetland types in the Daintree catchment
- endangered/of-concern ecosystem types contained at these wetland sites.

Both wetlands are on the floodplain of the Daintree catchment in the wet tropics region of Queensland.

The projects have highlighted the success of management agreements and incentives, as well as promoting an increased understanding of the function and value of wetlands. They have also provided the tools for the landholders to better manage their wetlands in the future.



Photo 1: McDowell swamp showing management 'reaches'

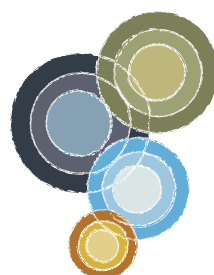
About the sites

McDowell swamp is the only oxbow lagoon formed by a cut-off meander loop in the lower Daintree floodplain. It is a 3-hectare wetland with four managing landholders. McDowell swamp protects the water quality of the Daintree River by providing a settling area for sediment, nutrients and other contaminant loads that are contained in run-off.

The surrounding area has mostly been cleared for agriculture, predominantly sugarcane. Crossings have been built across the swamp and have split it into six freshwater sections. There is also a tidal section downstream of Section 4, but tidal waters are prevented from entering the lagoon by a floodgate (see Photo 1). The swamp was chosen for the Pilot Program because of its high biodiversity and potential fishery values. It has three regional endangered/of-concern ecosystem types:

- **7.1.4** mangrove and vine forest
- **7.3.5** *Melaleuca quinquenervia* (swamp paperbark) and/or *M cajuputi*
- **7.3.25** *Melaleuca leucadendra* plus vine forest species and open to closed forest.

This remnant habitat provides a potential wildlife corridor for some sensitive species, including arboreal mammals and cassowaries, between the Daintree River and the nearby escarpment. Wetlands of this area host 74 recorded bird species, flying fox, estuarine crocodile, bat, melomys and water rat.



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Maslin's wetland is unique because it consists of a series of benched, freshwater, ephemeral wetlands. Although it is only 1.5 hectares in area, it has significant value as one of the few remaining freshwater wetlands in the Douglas Shire. The land was previously used as a grazing property. The current landholder is highly involved in the management of the wetland and has expanded and reinstated much of its ecological function. Maslin's wetland is utilised as an eco-tourism site focusing on bird-watching—by both the landholder and the public.

The wetland contains three regional endangered/of-concern ecosystem types:

- **7.3.10** Simple–complex mesophyll vine forest
- **7.3.23** Simple–complex semi-deciduous notophyll to mesophyll vine forest on lowland alluvium
- **7.3.25** *Melaleuca leucadendra* plus vine forest species and open to closed forest.



Photo 2: Aerial photo highlighting Maslin's wetland (photo: Jim Tait)



Photo 3: Small remnant stand of native bulkuru sedge (foreground), a wetland vegetation type that was more extensive before exotic pasture weeds (background) invaded (photo: Jim Tait)

Challenges

McDowell swamp

The **hydrology** of McDowell swamp is freshwater in reaches 2–7, with tidal influence restricted to reach 1, blocked at causeway 1 by a floodgate. This has modified the hydrology, with the floodgate lowering the water level in the lagoon and preventing tidal exchange. As a result, fish are no longer able to move between tidal and freshwater areas. Even if fish did pass through the floodgate, the other five causeways would prevent their passage. McDowell swamp has therefore been modified to the point where aquatic habitat, connectivity and movement opportunities for estuarine fish species into the wetland have been lost.

The problems of modified hydrology have been exacerbated by colonisation of much of the lagoon surface by invasive aquatic weeds. The lagoon receives catchment runoff from adjoining cane land, and this has caused a deterioration in water quality through increased nutrient levels and sediment loadings.

Exotic pasture grasses that have become 'naturalised' within the wet tropics lowlands infest McDowell swamp; they include para grass and hymenachne, along with guinea grass in well-drained riparian areas. These grasses have the following ecological impacts:

- competitive exclusion of overstorey seedlings, native wetland grasses and other wetland species such as bulkuru sedge
- detrimental effects on water quality, by smothering open water areas, shading native aquatic plants and generating large organic loadings, thereby reducing oxygen levels in resident and discharge water
- generation of large fire fuel loads, with the potential for hot and damaging wildfires in the drained wetland
- barriers to fish passage due to physical blockages (floodgate and road crossings) and/or chemical blockages in the form of low dissolved oxygen in water.



Photo 4 (photo: Jim Tait)

McDowell swamp includes a mix of vegetation types including some that are fire-sensitive (rainforest) and some that are fire-dependent (eucalypt and paperbark communities). In recent decades, **fire** appears to have been largely excluded from the wetland, resulting in:

- proliferation of weed species and fuel load build-up
- limited recruitment of fire-dependent overstorey species.

The current condition and values of the remnant vegetation communities of the McDowell swamp are affected by:

- **invasive woody weeds** such as pond apple
- **loss of protective vegetation buffers** between the wetland areas and surrounding land uses
- **unmanaged hot and/or frequent fires**
- **loss of corridor connectivity** to larger areas of upstream remnant vegetation.

Maslin's wetland

The main problem affecting the Maslin's wetland ecosystem is the perennial one of invasive weed encroachment into the riparian and wetland areas. Maslin's wetland is especially prone to impacts from exotic grasses, and from woody weeds in the riparian areas. The implications for the health of the wetland and the three regional endangered/of-concern ecosystem types are similar to those in McDowell Swamp.

Rehabilitation actions

McDowell swamp

To assist site assessment and rehabilitation needs, the swamp was divided into 'reaches', as shown in Photo 1. Each reach required different management to suit the landholders' preferred management regimes:

- The upper reaches were fenced and will be crash-grazed at the appropriate times for the control of hymenachne and para grass.
- The mid-reaches were managed with herbicide for the control of hymenachne, para grass and pond apple.
- The lower reaches were maintained in their original unmanaged status.

Pest management works included:

- treatment of small scattered infestations of olive hymenachne
- monitoring of olive hymenachne for reinfestation
- treatment of infestations of pond apple, including follow-up control.



Photo 5: Culling of pond apple infestation at McDowell wetland (photo: Jim Tait)

Maslin's wetland

An agreement was developed with the landholder to control the weeds at Maslin's Wetland. The project funded the cost of bioactive glyphosate (to be sprayed at specific intervals) and the landholder provided the labour. The landholder also agreed to maintain a time-series of photo-monitoring points to record vegetation changes.

Lessons learnt

The timeframe for fencing needed to be extended, because of several obstacles to the erection of fencing in the upper reach of McDowell swamp. First a prolonged wet season prevented access for the fencing contractor and delayed construction. (This highlights the need to be aware of, and plan for, the seasons in the wet tropics.) Then problems were encountered with sourcing materials (timber posts) and contractors.

Innovations

Wetland Incentives Program

This pilot trialled a wetlands incentive program aimed at supporting better management of privately owned wetlands in the Douglas Shire by landholders. Landholders were given information bulletins and were invited to apply for funding assistance. Various incentive approaches were investigated, to determine the strengths and weaknesses of each. They included:

- ecosystem services payments
- voluntary management agreements
- grants
- stewardship payments
- tax incentives
- nature refuges
- auction/tender systems
- conservation covenants.

The owners of the two sites chosen (Maslin's wetland and McDowell swamp) participated in voluntary management agreements, which included incentives. This arrangement proved successful in gaining the landholders' support for wetland management.



Further reading

Tait, J 2006, *Daintree Oxbow—McDowell swamp: identified management issues and options*, report prepared by WetlandCare Australia.

Bradley, P 2007, *Great Barrier Reef Coastal Wetland Protection Program*, Douglas Shire Incentives Project.

Bradley, P 2006, *Incentives project*, Terrain NRM (formerly FNQ NRM) & Douglas Shire Council.

Contacts

Terrain NRM (formerly FNQ NRM Ltd)

Phone: (07) 4043 8000

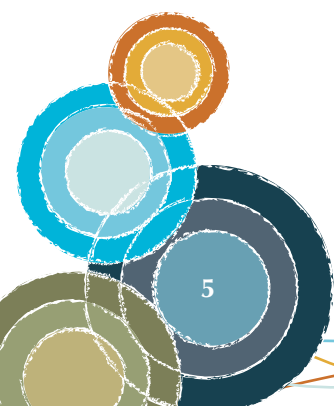
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WetlandCare Australia

Phone: (02) 6681 6169

www.wetlandcare.com.au

Photos courtesy of WetlandCare Australia



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