

# The Serpentine Lagoon wetland aggregation

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

Under the Pilot Program the Serpentine Lagoon was identified as a high-priority site with potential for significant improvements in biodiversity and water quality, as well as in livestock production. The first step in the pilot project was an ecological assessment of the lagoon, as the basis for site-specific clearing guidelines for controlling the chinee apple infestations. Following the guidelines, 160 hectares of chinee apple was cleared with a small bulldozer. This was an outstanding outcome, which will provide significant ecological improvement to this valuable wetland.

The project also involved negotiations with landholders, who agreed to fence off trial stock exclusion plots and investigate the effects of controlled grazing on wetland condition.

## About the site

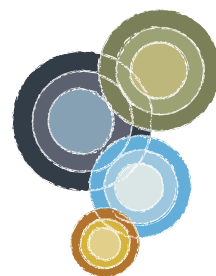
The Serpentine Lagoon is situated predominantly on two grazing properties, 45 km south of Townsville, in the upper reaches of the Haughton River catchment. The wetland aggregation covers 350 hectares and includes a large seasonally inundated area; this drains into a set of permanent and semi-permanent lagoons downstream but dries out during the dry season. A bund wall has been constructed downstream from the seasonally inundated area, to provide permanent water storage for livestock.

The area supports an outstanding variety of plant and bird life, and is highly valued by birdwatching groups. Townsville City Council has built a bird hide on the property, and access may be obtained with the landholders' permission.

The permanent deepwater lagoon habitats in the downstream margin of the wetland aggregation have high-integrity riparian vegetation and potential fish habitats. The downstream margin provides the most upstream habitats for migratory fish (including barramundi) within the Haughton River catchment.



Photo 1: Serpentine Lagoon during the dry season with heavy grazing pressure at the margins (photo: Jim Tait)



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Photo 2: Brolga are among a diverse range of fauna that use Serpentine Lagoon (photo: Jim Tait)



Photo 3: Water hyacinth is a threat to wetland health unless regularly controlled (photo: Jim Tait)

The high conservation value of the Serpentine Lagoon wetland aggregation has been recognised, and the site is listed in the national *Directory of important wetlands in Australia*. Since 2000, the area has been gazetted as a Nature Refuge by the Queensland Parks and Wildlife Service.

## Challenges

There were extensive chinee apple infestations across the Serpentine Lagoon site. This **woody weed** infested almost the entire perimeter of the seasonally inundated area, and led to the loss of open wetland habitat (favoured by nesting waterfowl and wader birds) and understorey diversity, and of grazing land.

**Grazing pressure** within the wetland has been detrimental. In the dry season it affects fringing vegetation, ground cover diversity and habitat; in the wet season, impacts of cattle on the wetland include pugging and trampling.

**Aquatic weeds** (particularly extensive infestation of water hyacinth) in the downstream deepwater channel and margin of the seasonal wetland have caused significant damage to the lagoon ecosystem.

## Rehabilitation actions

The Burdekin Dry Tropics NRM, Queensland Parks and Wildlife Service, the Australian Centre for Tropical Freshwater Research (ACTFR), and the property owners worked collaboratively to rehabilitate the wetlands. First they conducted an **ecological assessment**; then they developed site-specific clearing guidelines for controlling the chinee apple infestation with minimal environmental impact.

Chinee apple and other woody weeds were mechanically removed from 160 hectares of the area surrounding the Lagoon. Basal spraying of any regrowth was carried out at the cleared areas when the weather was appropriate.



Photo 4: Chinee apple infestation of woodland riparian area, September 2006 (pre-clearing) (photo: Jim Tait)



Photo 5: Burn piles and stick raking, January 2007 (post-clearing)  
(photo: Jim Tait)

### Key messages: clearing guidelines for Serpentine Lagoon

- Remove all chinee apple, including seedlings, sub-adults and mature trees, mostly with the use of a small bulldozer.
- All native trees and saplings, both living and dead, to remain untouched.
- Seedlings of native trees to remain untouched where practicable, with consideration of the movement of bulldozer and general access.
- Minimise erosion and/or compaction of surface soils.
- Bulldozing to be undertaken as much as possible in areas with moist but not saturated soils to minimise vegetative fragments remaining after initial clearing.
- Stick-raked debris piles to be burnt when dry enough, or left unburnt if too wet.
- Follow-up poisoning of chinee apple seedlings to be carried out after the wet season.

**Grazing management**, to allow seasonal exclusion of cattle (typically January to August) from wetland areas, was facilitated by assisting the property owners with material costs and contract labour to fence the northern wetland boundary.

Fencing also needs to be extended around the banded lagoon to encourage riparian regeneration, control grazing and fire management, and prevent damage to banks and bird habitat.

An aerial survey of the water hyacinth was carried out, and discussions were held with the property owners regarding aerial spraying of the weed. The weather prevented any action for some time, then heavy wet season rains flushed the bulk of the hyacinth from the system. Although the landowner is committed to ongoing maintenance, there is no formal agreement for the long-term management of **aquatic weeds** at the site.

ACTFR carried out **photo monitoring** at five comparison sites before and after mechanical removal of chinee apple.

After extensive negotiation, the landholder agreed to construct three trial **stock exclusion plots** so that the recovery of vegetation diversity and structure in ungrazed wetland areas could be assessed and monitored. The landowner was encouraged to photo-monitor the vegetation in these areas.

### Lessons learnt

Managing chinee apple infestation involved mechanical removal of the whole plant. The overall aim of woody weed removal is that the removal not create a greater environmental impact than the existing infestation. The ecological assessment and clearing guidelines therefore took into account the importance of minimising adverse impact on soils, native vegetation or any flow-on impacts to native wildlife or birdlife. The ecological assessment provided a basis for Burdekin Dry Tropics NRM to develop local guidelines for landholders for chinee apple control.



## Further reading

Dowe, J 2007, *Ecological assessment and clearing guidelines for the Serpentine Lagoon project*, ACTFR report no. 07/07, April 2007.

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Photos courtesy of WetlandCare Australia



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