

## Restoring coastal ecosystems for the Great Barrier Reef and the RAMSAR wetlands of Bowling Green Bay

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**Summary** The Lower Burdekin floodplain supports the nationally important cane industry. Changes in the landscape for cane irrigation purposes have led to a rather unique problem, too much water. Now relatively high groundwater levels and perennial surface flows (previously ephemeral) have led to a loss of seasonality in the coastal wetlands flowing into the Great Barrier Reef. Too much water also provided ideal conditions for the proliferation of invasive species resulting in significant loss of ecological service and function in these internationally recognised Ramsar Wetlands of Bowling Green Bay. Previous efforts to manage these threats to the wetlands relied on traditional means of mechanical and chemical control. While this effort was in itself successful, involving farmers and institutional land managers, it ignored the underlying cause, the overwhelming problem of too much water. Our previous research had measured floristic composition (as an indicator of weediness), and freshwater/

salinity and wetting/drying regimes for 88 wetlands across three land zone types. This research supported the hypothesis that wetland condition was dependant on these underlying features of the landscape. Our current project tested this hypothesis by strategically mimicking the natural wetting/drying regime to manage weeds and to ultimately restore ecological function to these priority coastal wetlands. To do this wetlands were dried out by improving efficiencies in the water delivery systems to reduce excess water and improved irrigation practices to reduce runoff. Under these more natural conditions, large areas of invasive aquatic weed infestations were controlled resulting in immediate responses of preferential aquatic species to return.

**Keywords** Great Barrier Reef (GBR) Ramsar, Bowling Green Bay, seasonality, land zones, coastal ecosystems, invasive species, wetting/drying regimes, aquatic weed management.