

KEY OUTCOMES FROM WETLANDCARE AUSTRALIA'S \$2.5 MILLION COASTAL 20 WETLANDS PROJECT

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Coastal wetlands play an essential role on and adjacent to floodplains that have considerable environmental, economic, cultural and social benefits for local communities. In the face of climate change, coastal wetlands are critical buffers to sea level rise and the severe weather events that cause storm surges and floods.

The Coastal 20 Wetlands Project, funded by the Australian Government's Caring for our Country program, is a pivotal initiative that has seen considerable gains in the health and functionality of 20 regionally, nationally and internationally significant coastal wetlands spanning 1,000 km from Kempsey in NSW to Gladstone in Qld. This ambitious project sought to tackle some of the most significant threats facing priority wetlands via the strategic delivery of on-ground works combined with extensive community engagement and the active participation of partner networks from government, industry, business and the wider community.

Since the project's inception in 2011, WetlandCare Australia has delivered on 31 different Federal Government targets and achieved landscape scale conservation outcomes over 3,250 ha of coastal wetlands throughout this region.

The success of this project has largely been the result of a highly collaborative and coordinated process. Prior to commencing on-ground work, a period of six months was dedicated to comprehensive stakeholder engagement. This enabled WetlandCare Australia to harness local knowledge and resources and identify the key restoration priorities for each of the target wetlands.

This project has served as an effective delivery model for natural resource management targets on the floodplain and demonstrated the capacity of non-government organisations to efficiently deliver multi-regional large scale projects. The model utilised for the Coastal 20 Wetlands Project can be readily applied to other landscape scale conservation projects to enhance the resilience of coastal wetlands in the face of changing climatic conditions, as well as bolstering their function as an often under-appreciated community resource.

Introduction

Since colonisation, coastal wetlands have been largely under-valued in Australia, leading to significant loss and degradation. The environmental, social, cultural and economic values of coastal wetlands are only beginning to be widely appreciated. Our floodplain wetlands systems are a highly valuable resource. Not only do they contribute substantial income to regional economies, they are essential to a healthy and functioning environment which contributes to the wellbeing of communities. There is also growing consensus that coastal wetland ecosystems are more important as carbon stores than any other ecosystem. The importance of conserving coastal wetlands to prevent increases in greenhouse gas emissions, sequester carbon and protect coastal communities against the impacts of climate change and associated severe weather events cannot be underestimated. Coastal wetlands also play a significant role in flood mitigation within the landscape (Potter 1994).

Historic and current land-based human activities continue to seriously impact coastal wetlands (Edyvane 1999). In highly populated coastline areas up to 90 per cent of wetlands have been lost since European settlement (Finlayson 2000, Usback & James 1993). Australia's population is continuing to increase rapidly and the pressure on our coastal wetlands is immense. Coastal wetlands are under continual threat of loss or damage from expanding coastal development, pollution and past land use impacts. This invariably has negative repercussions for their environmental, social, cultural and economic value including climate change buffering and flood mitigation.

The Significance of Coastal Wetlands

Cultural value of wetlands

Aboriginal people conceptualize water sources and rivers, as with the land, as having been derived from the Dreaming (Jackson *et al.* 2005). Coastal wetlands have therefore always had significant cultural importance to Traditional Owners. They are highly valued as a source of food, medicine and tools and of considerable cultural importance. Coastal Indigenous communities often held ceremonies in these areas and many Aboriginal artefacts still remain despite wide-spread desecration of these areas. Coastal wetlands are also places of great spiritual significance as mythological sites and the centre piece of dreamtime stories. For these reasons, Traditional Owners carefully managed these wetlands to ensure their sustainability and to protect their cultural values. Today these coastal wetlands are still of significant cultural value to Traditional Owners who continue to maintain links to their country through stories, lineage, occupation and use, however their sustainability is under serious threat.

Environmental value of wetlands

Wetlands are widely recognised as providing important wildlife habitats and as being among the most biologically productive and diverse habitats on the earth. Australian coastal wetlands are sites of high biodiversity (Kingsford 2000). Australia has sixty four

Ramsar listed wetlands recognized for their international significance as being representative, rare or unique wetlands, or important for conserving biological diversity. These ecosystems are a cornerstone to life and provide food, shelter and nursery areas for our native wildlife including micro-organisms, invertebrates, fish, birds, mammals and reptiles. Many of Australia's coastal wetlands provide important habitat for state, national and internationally listed threatened and endangered fauna species including migratory shorebirds which visit our coastlines each year. Wetlands function as a drought refuge in dry seasons. Some fauna species are so reliant on wetlands that evidence of their occupation can confirm the presence of a wetland.

Wetlands are vital to sustaining healthy rivers, on which our communities depend for the many land uses that surround them. Wetland plant communities form the basis of healthy wetland ecosystems (Davis and Froend 1998). Coastal wetlands are home to some of Australia's most iconic and adaptive plant communities, including numerous threatened species and endangered ecological communities. Coastal wetland plant communities include marine vegetation such as mangroves, saltmarsh and seagrass that provide vital fish nurseries, buffer our coasts from storms, sequester carbon and support habitat for migratory birds. Freshwater wetland refuges are also located along the coast containing a vast array of flora including paperbark forests, aquatic macrophytes, floodplain communities, littoral rainforest and coastal vine thickets lining our streams and rivers. Maintaining the assemblages contained within these plant communities is paramount to halting the loss of species and conserving the biodiversity and ecological integrity of these ecosystems.

Social value of wetlands

The social costs of wetland degradation have been largely unrecognized due to a lack of awareness of the numerous benefits and services provided by healthy, functioning wetlands (Turner *et al.* 1998). Coastal wetlands provide numerous services that not only directly benefit coastal communities, but also have considerable importance for society as a whole. Collectively these benefits are known as ecosystem services and have been estimated to contribute trillions of US dollars' of value each year worldwide to human health and well-being (Costanza *et al.* 1997).

One of the principal reasons that coastal wetlands have been undervalued is that healthy coastal ecosystems provide us with all of these benefits absolutely free. It is essential that the true dollar value of these critical services is recognised by decision makers and the community to ensure these vital coastal ecosystems are fully appreciated and protected. The wide ranges of ecosystem services that coastal wetlands provide include:

- Food and medicine;
- Water storage and groundwater replenishment;
- Shoreline stabilisation and storm protection;
- Flood control;
- Underpin a robust rural economy;
- Habitat to animals that provide free services to farmers through insect predation and pollination;
- Sediment and nutrient retention and export;
- Water purification;
- Reservoirs of biodiversity;
- Nurseries for recreational and commercial fish species;

- Wetland products;
- Cultural values;
- Recreation and tourism; and
Climate change mitigation (carbon sequestration) and adaptation

Economic value of wetlands

A number of internationally peer reviewed studies have been conducted to quantify the economic value of wetlands. These studies have taken into account the numerous services that wetlands provide. Globally these services have been estimated to be as high as \$4.8 trillion per annum (Costanza *et al.* 1997). These services include 'direct use' of these wetlands such as fishing or recreation and other benefits to the surrounding communities including water purification, flood control, water storage, nutrient treatment and carbon storage (ACF 2010).

A briefing paper by the Australian Conservation Foundation on the economic benefits of Australian wetlands has found that the ecosystem services value equates to \$3,335 per hectare, per year. This does not take into consideration the value to recreational and commercial fisheries provided by coastal wetlands which would increase this figure significantly. The nature-based tourism industry alone contributes \$23 billion to the Australian economy every year and is the fastest growing sector of the tourism market (Tourism and Transport Forum 2011). Wetlands are an integral component of this tourism sector and provide visitors with unique aesthetic and recreational experiences. Wetlands are therefore intrinsically linked with tourism and the economic return that this market returns to regional economies.

The carbon sequestration capacity of coastal wetlands, in particular mangroves, saltmarsh and seagrass, has recently become a key focus of wetland research and management. A seminal report published in 2009 called *The Management of Natural Coastal Carbon Sinks* (Laffoley & Grimsditch 2009) highlighted that carbon sequestration rates of coastal wetlands are actually much higher than those of terrestrial systems. Conversely, the destruction of these wetlands is contributing a disproportionate amount of CO₂ into the atmosphere, and these emissions continue for years after their destruction.

Coastal Wetlands, Climate Change and Flood Mitigation

Coastal wetlands, such as mangroves, saltmarshes, lagoons and estuaries, play an important role in protecting human communities from storm surges and extreme weather events by acting as a physical barrier or buffer that reduces or absorbs the waters height and speed (Ramsar 2010). Wetland vegetation can bind the shoreline together combating erosion associated with storms and tidal events. The destruction of such wetlands through land-claim and conversion for urban, industrial and agricultural development can have deadly consequences.

Intact wetlands play a vital role in flood mitigation (Potter 1994). Storage of water in wetlands decreases and delays downstream flood peaks. Drainage and clearing of wetlands for urban or agricultural development, increases the rate and volume of water outflow, exacerbating downstream flooding. Other wetland threats can impact on a

wetlands ability to mitigate flooding. Catchment wide erosion can lead to sedimentation and in-filling of wetlands, reducing their capacity to hold large volumes of water. Loss of native vegetation communities can impact on flow rates and evapotranspiration. Wetland vegetation communities can act like sponges absorbing or slowing water allowing it to evaporate or seep into the soil. Reinstating natural hydrology and vegetation communities to wetlands promotes the long-term storage of water within the wetland, increases evapotranspiration losses and groundwater seepage, reducing downstream flooding.

The Coastal 20 Wetlands Project

In WetlandCare Australia's 20th year of operation, Australia's leading wetland conservation organisation embarked on an important initiative, the \$2.5 million Coastal 20 Wetland Project. Now in its final stages, this innovative project, funded under the Australian Government's Caring for our Country program, has enabled an improvement in health of 20 coastal wetlands that span 1000 km of the northern New South Wales and south-east Queensland coastlines (Figure 1). These 20 iconic coastal sites were strategically targeted for a range of on-ground, education and community engagement activities to improve wetland function and associated ecosystem services, and to promote the value of coastal wetlands within the community.



Figure 1: The Coastal 20 Wetland Project sites in northern NSW and south east Queensland

The objectives of the Coastal 20 project were clearly defined as:

- Delineate priority wetlands needed for water quality, biodiversity and climate change management purposes;
- Generate a high level of community awareness of the values and functions that these areas provide including climate change and flood mitigation and carbon storage;
- Provide landholders with training and resources to assist in biodiversity conservation;
- Assist local governments with integrating water sensitive urban designs into adjoining coastal wetland rehabilitation projects;
- Rehabilitate key degraded wetland areas e.g. livestock removal, infilling drains, revegetation, removal of water diversion schemes; and
- Develop wetland areas to provide appropriate recreational and educational pursuits in line with the aspirations of the local communities.

The Coastal 20 project team worked closely with the community and key stakeholders to identify and prioritise major impacts occurring at the 20 coastal wetlands, and to develop and enact innovative and sustainable solutions. Management actions were identified and carried out through partnerships, to bring about considerable environmental, cultural, social and economic benefits. Actions included:

- Wetland restoration of over 3250 ha to improve wetland health, biodiversity habitat and connectivity, wetland hydrology, repair bank instability and reduce erosion and sedimentation;
- Reinstatement of natural hydrology through drain infilling and in-drain structures to promote restoration of wetland vegetation, ameliorate impacts of acid sulfate soils and improve carbon sequestration and flood mitigation capacity;
- Increase the resilience of endangered ecological communities, threatened flora species and wetland vegetation by reducing threats including nationally significant weeds (over 260 ha) and feral animal invasion (more than 3000 ha);
- Design of constructed wetlands to improve water quality and increase wetland services;
- Reduce impacts to native vegetation from excessive human or vehicular access;
- Installation of swales, bunds, vegetative filter strips and sediment traps to mitigate sedimentation impacts from agriculture and enable farmers to retain soil on their land;
- Worked with 56 farmers for improved wetland management on over 1300 ha of coastal farmland through stock exclusion, off-stream watering and weed and pest control; and
- Engaged 58 community groups to participate in natural resource management and improve the understanding of wetland values and management.

The primary focus of the Coastal 20 Wetland Project's on-ground works was aimed at coastal wetland rehabilitation and protection to maximise the ecosystem services that they can provide, conserving and enhancing wetland health and promoting their sustainable use as functional, valuable ecosystems. A range of complimentary community education and engagement activities increased the effectiveness and sustainability of on-ground actions. WetlandCare Australia engaged a range of stakeholders in the project, including Indigenous groups, landholders, schools, natural resource managers and the tourism industry to identify opportunities for education to contribute to the sustainability of our

coastal wetland assets and their significant cultural, environmental, social and economic values.

Where to from here?

Given the historic and on-going loss of Australian coastal wetlands, continuing sustainable on-ground works and community engagement to reverse this trend are essential if coastal wetlands are to persist and function effectively, proving their range of benefits to local communities into the future.

Through the Coastal 20 Wetland Project, WetlandCare Australia's team of qualified wetland experts developed a close working relationship with the community and key stakeholders across coastal Qld and NSW. Major impacts occurring at the 20 coastal wetlands have been collaboratively identified and prioritised, and innovative and sustainable solutions have been developed. Many of these solutions have been put in place under the Coastal 20 project and community partnerships will see on-going, on-ground actions effectively delivered and monitored. However, further funding is needed to build upon the investment of the Coastal 20 Wetland Project and harness the momentum achieved to safeguard coastal wetlands and the services that they will be increasingly relied upon to provide in a changing climate.

For more information on the Coastal 20 Wetlands Project please contact Adam Gosling at WetlandCare Australia, adamgosling@wetlandcare.com.au or visit www.wetlandcare.com.au

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